INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS

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FIELD

EXPERIMENTS

VOL. 15 PART 2

CENTRAL INSTITUTES

1954-59

PUBLISHED BY
INDIAN COUNCIL OF AGRICULTURAL RESEARCH
NEW DELHI
FOREWORD

Increase in agricultural production is one of the main objectives of our agricultural planning. It is only by the exploitation of scientific methods of agriculture that we can hope to increase our agricultural production to the level needed for maintaining a reasonable standard of living to the country's population. The technical worth of improvement measures is best judged from carefully conducted field experiments. While it is true that a large number of agricultural field experiments are conducted in the country, the results of these experiments have not been brought together in an integrated manner for the use of research workers. The absence of such a unified account has often led to duplication of work and delay in the utilization of results for practical farming. The Institute of Agricultural Research Statistics has rendered a very valuable service by preparing a compendium of agricultural field experiments conducted in the country. The first series of compendium containing the results of all agricultural field experiments during the period 1948-53 have already been published by the Institute.

The present compendium is the second in the series covering the period 1954-59. As in the earlier compendium, the present series also contains critical summaries of results of experiments bearing on important agronomic factors, such as the response of crops to fertilizers and manures, inter-relationship of fertilizers, varieties and cultivation practices and other information of value for giving sound advice to farmers in different regions. Judging from the demand for the first series of the compendium, I am sure that the present series will also prove equally useful.

A Standing Committee consisting of the Agricultural Commissioner with the Government of India, the Director, Indian Agricultural Research Institute, and the Statistical Adviser, Indian Council of Agricultural Research, has been set up to provide general guidance to the work under this scheme. I congratulate the members of this Committee and, in particular, the Statistical Adviser and his associates at the Institute of Agricultural Research Statistics for bringing out this compendium. The preparation of this compendium has been made possible only by the wholehearted co-operation of the States and other organisations in making available the results of their experimental researches for this purpose. My thanks are due to the officers of the State Departments of Agriculture and other institutions for participating in this work. I hope that the present series will be followed by periodical publications of similar compendia for later years, in order that the availability, in a consolidated form, of results of scientific experiments in agriculture in India may be maintained up-to-date.

NEW DELHI,
March 26, 1965.

A. D. PANDIT
Vice-President,
Indian Council of Agricultural Research.
PREFACE

The present set of volumes form Part II in the series of compendia of Agricultural Field Experiments being published by the Indian Council of Agricultural Research under the project for National Index of Field Experiments and contains a unified record of experiments conducted at agricultural research stations and institutes all over the country. Volumes in Part I in this series were published in 1962 and contained results of some 7,500 experiments conducted during the period 1948-53. The present set of volumes includes results of experiments conducted during the next period that is 1954-59. After the period, covered by Part I of the series, agricultural research and experimentation has expanded so much that for the period 1954-59, to which the present volumes refer, results of more than 15,000 experiments are available.

The present compendium is prepared on the same pattern as the previous one and is divided into 15 volumes one each for (1) Andhra Pradesh, (2) Assam, Manipur and Tripura, (3) Bihar, (4) Gujarat, (5) Kerala, (6) Madhya Pradesh, (7) Madras, (8) Maharashtra, (9) Mysore, (10) Orissa, (11) Punjab, Jammu and Kashmir and Himachal Pradesh, (12) Rajasthan, (13) Uttar Pradesh (14) West Bengal and (15) All Central Institutes. In each volume, background information of the respective state regarding its division into different soils and agro-climatic regions, rainfall and cropping pattern followed in each region and agricultural production and area under different crops in the State is given. The experiments reported in each volume have been arranged crop-wise for each State. All the experiments belonging to a particular crop at various research stations are Grouped together. For a particular crop, experiments are arranged according to the following classification:

- Manurial (M), Cultural (C), Irrigational (I), Diseases, pests and chemicals other than fertilizers (D), Rotational (R). Mixed cropping (X) and combinations of these wherever they occur (e.g. CM as Cultural-cum-Manurial). Experiments in which crop varieties also form a factor are denoted by adding V to their symbol and are grouped together (e.g. MV as Manurial-cum-Varietal).

This publication owes its origin to the guidance and help of Dr. D.J. Finney, F.R.S., Professor of Statistics, Aberdeen University, Scotland, in formulating the project during his stay at the Institute of Agricultural Research Statistics as an F.A.O. expert in 1952-53.

At the Institute of Agricultural Research Statistics the work under the scheme was carried out under the supervision of Shri. T.P. Abraham, Assistant Statistical Adviser. The actual working of the scheme was conducted by Shri G.A. Kulkarni, Statistician till he left the Institute in July, 1964. The work was subsequently taken over by Shri O.P. Kathuria, Assistant Statistician, Messrs. L.B.S. Somayazulu, P.P. Rao, M.L. Sahni, Harbhajan Singh, A.L. Punhani, M.K. Joshi, N.K. Worrier, H.C. Jain and J.K. Kapoor of the statistical staff of the Institute deserve special mention for careful and painstaking work in editing and scrutiny of the manuscript as well as proofs of the compendium.

The burden of collecting the data from the various research stations and the analysis of a large number of experiments once again fell on the regional staff of the Council placed in different States. They deserve to be congratulated for the hard work they have put in.

Thanks are due to the State Departments of Agriculture, the Central Institutes and the Commodity Committees who made the data of the experiments conducted under their jurisdiction readily available to the staff of the Institute. The present publication has become possible only through their unstinted co-operation. The Institute is also thankful to the various
officers in the States who worked as Regional Supervisors for the project from time to time and took keen interest in the working of the Scheme. The list of the names of the regional supervisors and the regional staff of the project is given on the following page.

V.G. Panse
Statistical Adviser,

New Delhi,
March 25, 1965.
<table>
<thead>
<tr>
<th>Region and Headquarter</th>
<th>Statistical staff from the Institute of Agricultural Research Statistics</th>
<th>Regional Supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Andhra Pradesh (Hyderabad)</td>
<td>S.K. Jilani, P.R. Veri</td>
<td>Dr. Mohd. Quadiruddin Khan, Joint Director of Agricultural.</td>
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<td></td>
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<td>Late Dr. Syed Wahiddin.</td>
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<td>Shri Md. Khasim Adoni, Joint Director of Extension.</td>
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<td>Shri N.V. Mohana Rao, Joint Director, Agricultural Research Institute, Rajendranagar.</td>
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<td>Shri L. Venkataratnam, Deputy Director of Agriculture (Research).</td>
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<td>P.D. Mehta, B. Ramakrishnan</td>
<td>Shri D.S. Rangarao, Statistician, Department of Agriculture.</td>
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<td>Shri J.B. Trivedi, Deputy Director of Agriculture (Statistics).</td>
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<td>5. Madhya Pradesh (Bhopal)</td>
<td>T. Lokeswara Rao, H.C. Gupta</td>
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<td>6. Punjab, Jammu &amp; Kashmir &amp; Himachal Pradesh (Chandigarh)</td>
<td>A.C. Kaithra, B.L. Kaithra, M.S. Batra</td>
<td>Shri P. K. Singh Sahota, Director of Crop Insurance.</td>
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<td>Shri Mohinder Singh Pannu, Statistician, Department of Agriculture.</td>
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<td>Shri R.S. Roy, Principal, Agricultural Research Institute, Sabour.</td>
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<tr>
<td>8. Rajasthan (Jaipur)</td>
<td>B.P. Dyundi, N.K. Ohri</td>
<td>Shri H.C. Kothari, Statistician, Department of Agriculture,</td>
</tr>
<tr>
<td>9. Orissa (Bhubaneswar)</td>
<td>L.B.S. Somayazulu</td>
<td>Shri B. Misra, Deputy Director of Agriculture (HQ).</td>
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<td></td>
<td></td>
<td>Shri D. Misra, Principal, Uttarakal Krushi Mahavidyalaya, Bhubaneswar.</td>
</tr>
<tr>
<td>10. West Bengal (Calcutta)</td>
<td>S.N. Nath</td>
<td>Shri S.N. Mukerjee, Statistical Officer, Directorate of Agriculture;</td>
</tr>
</tbody>
</table>
11. Madras (Coimbatore)  
P. Prabhakara Rao  
V. Venkateswara Rao  

Madras Agricultural College and Research Institute, Coimbatore.

Late Shri M. Bhavani Sankar Rao,  
Vice-Principal and Secretary.

Shri T. Natarajan,  
Agronomist.

Shri A.H. Sarma,  
Extension Specialist.

Shri V. Raman,  
Secretary, Research Council.

Shri K.R. Nagaraja Rao,  
Secretary, Research Council.

12. Assam (Shillong)  
T.K. Gupta

Dr. S.R. Barooah,  
Director of Agriculture, Assam.

Shri B.N. Duara,  
Joint Director of Agriculture, Assam.

13. Mysore (Bangalore)  
K.A. Balakrishnan

Shri M.A. Walia,  
Director of Statistics.

Shri B.V.S. Rao,  
Assistant Director of Statistics.

14. Kerala (Trivandrum)  
V.N. Iyer

Shri M. Janardanan Nair,  
Director of Agriculture.

Shri N. Shankara Menon  
Director of Agriculture.

Shri P.D. Nair,  
Director of Agriculture.
ABBREVIATIONS COMMON TO EXPERIMENTS ON ANNUAL AND PERENNIAL CROPS AND EXPERIMENTS ON CULTIVATORS’ FIELDS.

**Crops** - In the top left corner is given the name of the crop on which the experiment is conducted. Within brackets along side the crop is mentioned the season where ever the information is available.

**Ref** - Against the sub-title 'reference' is mentioned the name of the State, the year in which the experiment is conducted and the serial number of the experiment for that year given in brackets.

Abbreviations adopted for States are as follows:

1. A.P.—Andhra Pradesh
2. As.—Assam
3. Bh.—Bihar
4. Gj.—Gujarat
5. H.P.—Himachal Pradesh
7. K.—Kerala
8. M.P.—Madhya Pradesh
9. M.—Madras
10. Mh.—Maharashtra
11. Ms.—Mysore
12. Or.—Orissa
13. P.—Punjab
14. Rj.—Rajasthan
15. U.P.—Uttar Pradesh
16. W.B.—West Bengal

For the experiments conducted under the schemes sponsored by the Indian Council of Agricultural Research like the Model Agronomic Experiments or the Simple Fertilizer Trials scheme no serial numbers have been given at the source as the data of these experiments were collected at the Headquarters (New Delhi). In such cases the abbreviations MAE, SFT or TCM are given in the brackets against the year in which the experiment is conducted.

**Site** - Name of the Research Station is mentioned along with the place where it is located, e.g. Agri. Res. Stn. for Agricultural Research Station.

For Central Institutes, the corresponding standard abbreviations have been adopted e.g. I.A.R.I. for the Indian Agricultural Research Institute.

In case of the experiments conducted on cultivators’ fields whether under an Indian Council of Agricultural Research scheme or by the State Government, the abbreviation (c.f.) is given along with the site or centre as, for example, Cuttack (c.f.).

**Type** - Abbreviations used against this item are one or more than one of the following:

C—Cultural; D—Control of Diseases and Pests; I—Irrigational; M—Manurial; R—Rotational; V—Varietal and X—Mixed cropping. e.g. CM is to be read as Cultural-cum-Manurial.

**Object** - A statement of the objective of the experiment is given indicating the main crop and type of the experiment. In case of M.A.E., S.F.T. and T.C.M. experiments, the type to which the experiment corresponds is also given, e.g. Type V, Type A or B or C etc.

**Results** - Information under this heading should be read against the following items:

(i) General mean. (ii) S.E. per plot. (iii) Results of test of significance. (iv) Summary table(s) with S.E. of comparison(s).

Other abbreviations used in the text of experiments:

- Nitro. Phos.—Nitro. Phosphate
- A.—Ammonium Nitrate
- N.—Nitrogen
- A(S)—Ammonium Sulphate
- C(N)—Chilean Nitrate
- A(S/N)—Ammonium Sulphate Nitrate
- A(C)—Ammonium Chloride
- A(A/N)—Calcium Ammonium Nitrate
- P.—Phosphate
K.—Potash  F.M.—Fish Manure
B.M.—Bone meal  G.N.C.—Groundnut cake
Mur. Pot.—Muriate of Potash  M.C.—Municipal Compost
Pot. Sul.—Potassium Sulphate  T.C.—Town Compost
Super—Super Phosphate  lb.—Pounds
Zn. Sul.—Zinc Sulphate  Srs.—Seers
C/S—Copper Sulphate  B.D.—Basal dressing
G.M.—Green Manure  C.L.—Cart load
F.Y.M.—Farm Yard Manure  ac.—Acre
F.W.C.—Farm Waste Compost  Dical. Phos.—Dicalcium Phosphate

Under the item (ii) (b) of the sub-heading 'Basal conditions' in the text of the experiment, the respective farm/station at which the experiment was conducted has been referred to for the soil analysis. The soil analysis of the farm, with other details of the research station is given under the background information of each state. The information regarding the details of experimental stations may be obtained under the respective items as given below:

DETAILS OF EXPERIMENTAL STATIONS

A. General information:
   (i) District and the nearest railway station with Latitude, Longitude and Altitude if available. General topography of the experimental area. (ii) Type of tract it represents. (iii) Year of establishment. (iv) Cropping pattern. (v) Programme of research.

B. Normal rainfall:
   Average monthly rainfall specifying the period on which the figures are based.

C. Irrigation and drainage facilities:
   (i) (a) Whether available, if so, since when. (b) Type of facilities available. (ii) Whether there is a proper drainage system.

D. Soil type and soil analysis:
   (i) Broad soil type with depth, colour and structure etc. (ii) Chemical analysis. (iii) Mechanical analysis.

E. No. of experiments:
   No. of experiments conducted on different crops that have been included in the compendium.

Information under the following heads is to be read against the respective items as given below.

BASAL CONDITIONS

A. For experiments on annual crops:
   (i) (a) Crop rotation if any. (b) Previous crop. (c) Manuring of previous crop. (State amount and kind). (ii) (a) Soil type. (b) Soil analysis. (iii) Date of sowing/planting. (iv) Cultural practices. (a) Preparatory cultivation. (b) Method of sowing/planting. (c) Seed-rate. (d) Spacing. (e) No. of seedlings per hole. (v) Basal manuring with time and method of application. (vi) Variety. (vii) Irrigated or Unirrigated. (viii) Post-sowing/planting cultural operations. (ix) Rainfall during crop season (x) Date of harvest.

B. For experiments on perennial crops:
   (i) History of site including manuring and other operations. (ii) (a) Soil type. (b) Soil analysis. (iii) Method of propagation of plants. (iv) Variety. (v) Date and method of sowing/planting. (vi) Age of seedlings at the time of planting. (vii) Basal dressing with time and method of application. (viii) Cultural operations during the year. (ix) Inter cropping if any. (x) Irrigated or Unirrigated. (xi) Rainfall during crop season. (xii) Date of harvest.
( xi )

C. For experiments on cultivators' fields:

(i) (a) Crop rotation, if any. (b) Previous crop. (c) Manuring of previous crop. (ii) Soil type in general. (iii) Basal manuring with time and method of application. (iv) Variety. (v) Cultural practices. (a) Preparatory cultivation. (b) Method of sowing. (c) Seed-rate. (d) Spacing. (e) No. of seedlings per hole. (vi) Period of sowing/planting. (vii) Irrigated or Unirrigated. (viii) Post-sowing/planting cultural operations. (ix) Rainfall during crop season. (x) Period of harvesting.

DESIGN

A. For experiments on annual crops:

(i) Abbreviations for design: C.R.D.-Completely Randomised Design. R.B.D.-Randomised Block Design, L. Sq.-Latin Square, Confld.-Confounded, Fact.-Factorial. (other designs and modifications of the above to be indicated in full). (ii) (a) No. of plots per block. (b) Block dimensions. (iii) No. of replications. (iv) Plot size. (a) Gross (b) Net. (v) Border or guard rows kept. (vi) Whether treatments are randomised (separately in each block).

B. For experiments on perennial crops:

(i) Abbreviations for designs: C.R.D.-Completely Randomised Design; R.B.D.-Randomised Block Design; L.Sq.-Latin Square; Confld.-Confounded. (other designs and modifications of the above indicated in full). (ii) (a) No. of plots per block. (b) Block dimensions. (iii) No. of replications. (iv) No. of trees/plot. (v) Border or guard rows kept. (vi) Are treatments randomised.

C. For experiments on cultivators' fields:

(i) Method of selection of experimental sites. (ii) No. and distribution of experiments. (iii) Plot size. (a) Gross. (b) Net. (iv) Whether treatments are randomised.

GENERAL

A. For experiments on annual crops:

(i) Crop conditions during growth with date of lodging, if any. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years—(a) from what year to what year, (b) whether treatments were assigned to the same plots in the same manner every year, (c) reference to combined analysis, if any. (v) In case of repetition in other places (a) names of the places along with reference and (b) reference to combined analysis, if any. (vi) Abnormal occurrences like heavy rains, frost, storm etc., if any. (vii) Any other important information.

B. For experiments on perennial crops:

(i) Crop condition during the year. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years—(a) from what year to what year, (b) reference to combined analysis, if any. (v) Abnormal occurrences like heavy rains, frost, storm etc., if any. (vi) Any other important information.

C. For experiments on cultivators' fields:

(i) Crop condition during growth. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years, (a) from what year to what year, (b) whether treatments were assigned to the same plots in the same manner every year, (c) reference to combined analysis, if any. (v) In case of repetition in other places names of places along with reference. (vi) Abnormal occurrences, like heavy rains, frost, storm etc., if any. (vii) Any other important information.
TABLE OF CONVERSIONS TO METRIC UNITS

<p>| 1 foot       | = 304.8 mm.  |
| 1 acre       | = 0.404606 hectare. |
| 1 gram       | = 0.035274 ounce = 0.085735 tola = 0.017147 chatak |
| 1 kg.        | = 2.20462 pounds = 1.07169 seers. |
| 1 metric tone| = 0.9842 ton = 26.7923 maunds. |
| 1 maund      | = 0.373242 quintal = 37.3242 kg. |
| 1 lb./ac.    | = 1.12085 kg/hectare. |
| 1 md./ac.    | = 92.23002 kg/hectare = 0.9223 quintal/hectare. |
| 1 ton/ac.    | = 2.51071 metric tones/hectare. |
| 1 gallon (Imp.) | = 4.54396 litres. |</p>
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Crop</th>
<th>Botanical name</th>
<th>Assamese</th>
<th>Bengali</th>
<th>Oriya</th>
<th>Telugu</th>
<th>Tamil</th>
<th>Malayalam</th>
<th>Kannada</th>
<th>Marathi</th>
<th>Gojaratil</th>
<th>Hindi</th>
<th>Punjabi</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Paddy</td>
<td><em>Oryza sativa</em> L.</td>
<td>Dhan</td>
<td>Dhan</td>
<td>Dhano</td>
<td>Vridh</td>
<td>Nel</td>
<td>Nelu</td>
<td>Bhatta</td>
<td>Bhat</td>
<td>Dangar</td>
<td>Chau</td>
<td>Daan</td>
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<tr>
<td>2.</td>
<td>Wheat</td>
<td><em>Triticum aestivum</em> L.</td>
<td>Gaum, Ghebu</td>
<td>Gam</td>
<td>Gaham</td>
<td>Godumalu</td>
<td>Kothumai</td>
<td>Godhambu</td>
<td>Godhi</td>
<td>Gubh</td>
<td>Gobhun</td>
<td>Gecon</td>
<td>Kansik</td>
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<tr>
<td>4.</td>
<td>Bajra</td>
<td><em>Pennisetum typhoides</em> L.</td>
<td>—</td>
<td>Bajra</td>
<td>Saja</td>
<td>Kambu</td>
<td>Sajje</td>
<td>Bajri</td>
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<td>Bajra</td>
<td>Bajra</td>
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<td>5.</td>
<td>Maizes</td>
<td><em>Zea mays</em> L.</td>
<td>Gom dhan</td>
<td>Bhutta</td>
<td>Macca</td>
<td>Mokkajonna</td>
<td>Makka cholam</td>
<td>Munsakina Jola</td>
<td>Malaka</td>
<td>Makkai</td>
<td>Makki, Makaye</td>
<td>Makkai</td>
<td>Mokki, Makaye</td>
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<td>6.</td>
<td>Oats</td>
<td><em>Avena sativa</em> L.</td>
<td>Oat</td>
<td>Jai</td>
<td>Jai, Ota</td>
<td>Yavalu</td>
<td>Ost ari</td>
<td>Thoke godhi</td>
<td>Jai</td>
<td>Jaie</td>
<td>Jaie, Jee</td>
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<td>7.</td>
<td>Tomato</td>
<td><em>Lycopersicium esculentum</em> Mill.</td>
<td>Bilari</td>
<td>Bilati begu</td>
<td>Bilati baisahepatatalaghant</td>
<td>Tomato; Ramamulaka; Seemina vanikaya</td>
<td>Thakkali</td>
<td>Thakkali</td>
<td>Welwanzgi ; Tumbati</td>
<td>Vilajiti waga ; Tameta</td>
<td>Tamatter</td>
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<td>8.</td>
<td>Pea</td>
<td><em>Pisum arvense</em> L.</td>
<td>Motor</td>
<td>Chota; Paya-matar</td>
<td>Bada Chana</td>
<td>Desavali Batai</td>
<td>Pattaani</td>
<td>—</td>
<td>Holads bataani</td>
<td>Vatana ; Matar</td>
<td>Vatana</td>
<td>Mattar</td>
<td>Mattri</td>
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<td>10.</td>
<td>Bengal gram</td>
<td><em>Citrus arisitum</em> L.</td>
<td>Butnah</td>
<td>Chola</td>
<td>Boot</td>
<td>Sanagalu</td>
<td>Kudala</td>
<td>Kudale</td>
<td>Harbala Chana</td>
<td>Chana</td>
<td>Chhola, Chana</td>
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<td>11.</td>
<td>Green gram</td>
<td><em>Phaseolus aureus</em> Roanh.</td>
<td>Magum</td>
<td>Sonamug</td>
<td>Mung</td>
<td>Pachanepal</td>
<td>Pachnipayaru ; Pasapayaru</td>
<td>Carupayaru ; Payaru</td>
<td>Hesaru</td>
<td>Mag</td>
<td>Mag</td>
<td>Moong, Mung</td>
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<td>13.</td>
<td>Carrot</td>
<td><em>Daucus carota</em> L.</td>
<td>Gajor</td>
<td>Gajor</td>
<td>Gajar</td>
<td>Kaaret Kepal</td>
<td>Carrot</td>
<td>Kempt mutangi</td>
<td>Gajar</td>
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## Glossary of Vernacular Names of Crops

<table>
<thead>
<tr>
<th>Sl. No.</th>
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<th>Botanical name</th>
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<td>15.</td>
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<td>Harad</td>
<td>Kandulu</td>
<td>Thuvral</td>
<td>Thuvaram payaru</td>
<td>Thogari</td>
<td>Tur</td>
<td>Tever</td>
<td>Arhar</td>
<td>Harhar</td>
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<td>18.</td>
<td>Tobacco</td>
<td>Nicotiana tabacum L.</td>
<td>Dhopat</td>
<td>Tamak</td>
<td>Unaptra</td>
<td>Pogaku</td>
<td>Pugayli</td>
<td>Pukayila</td>
<td>Hoge soppu</td>
<td>Tambku</td>
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<td>19.</td>
<td>Groundnut</td>
<td>Arachis hypogaea L.</td>
<td>China Badam</td>
<td>Cheena badam</td>
<td>China-badam</td>
<td>Nelashanga</td>
<td>Nilakkadalu</td>
<td>Nilakkadalu</td>
<td>Kadales kaysa</td>
<td>Bhuimug</td>
<td>Bhasing ; Magafai</td>
<td>Mungphali ; Mangfali</td>
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<td>20.</td>
<td>Linseed</td>
<td>Linum usitatissimum L.</td>
<td>Tisi</td>
<td>Tishi</td>
<td>Peshi</td>
<td>Avise</td>
<td>Alivithai</td>
<td>Cherucha navithi</td>
<td>Agase</td>
<td>Javas ; Alsi ; Alsi</td>
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<td>21.</td>
<td>Sesamum</td>
<td>Sesamum indicum L. , Sesamum orientale L.</td>
<td>Til</td>
<td>Til</td>
<td>Rasi</td>
<td>Nuvvulin</td>
<td>Ellu</td>
<td>Ellu</td>
<td>Yelli</td>
<td>Til, Til</td>
<td>Tali</td>
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<td>23.</td>
<td>Roselle</td>
<td>Hibiscus sabdariffa L.</td>
<td>Treaga Mora</td>
<td>Mesta</td>
<td>Khusta</td>
<td>Kalmuria</td>
<td>Erzaggou</td>
<td>Siwpaga, Kashnakai</td>
<td>Karpogum, drake</td>
<td>Tambdi ambadi</td>
<td>Lai sheria</td>
<td>Patusa</td>
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<td>24.</td>
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<td>Trifolium alexandrinum L.</td>
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<td>Berseem</td>
<td>Gini ghusu</td>
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<td>Barsim</td>
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<td>26.</td>
<td>Hubam clover</td>
<td>Melilotus alba var. annus</td>
<td>—</td>
<td>Swet bannmethi</td>
<td>Nt kran</td>
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<td>Hubbam clover</td>
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<td>27.</td>
<td>Senji (Indian clover)</td>
<td>Melilotus Parviflora Desv.</td>
<td>—</td>
<td>Bannmethi</td>
<td>Barzin</td>
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Central Rice Research Institute
CUTTACK
CENTRAL RICE RESEARCH INSTITUTE, CUTTACK.

1. Name of the experimental station: Central Rice Research Institute.
2. Tehsil or Taluka: Cuttack.
3. District: Cuttack.
4. Address: Director, C.R.R.I., Cuttack-6.
5. Year of establishment: 1946.
6. Latitude 20.5° North
   Longitude 86° East
   Altitude 23.48 metres
7. Whether research, multiplication or demonstration farm: Research farm.
9. Programme of research: Fundamental and applied research with stress on latter on rice crop.
10. Normal cropping pattern: Green manure—Rice—Rice in irrigable lands. Rice—legume or vegetable or other rabi crop in high and medium lands.
11. Type of tract it represents: Mahanadi delta.
12. General description of the topography of the experimental area: Slightly high lands on the periphery with low lands in the centre, somewhat like a basin. Water stagnation is common in heavy monsoon months, all these years, but now drainage facilities are being improved.
13. Soils:
   (a) Broad soil types: Alluvial delta soil
   (i) Depth: Quite deep
   (ii) Colour: Light grey to light brown
   (iii) Structure: Crumb to massive.
   (b) Chemical analysis:
      pH 5.7 to 6.9
      C 0.41 to 1.12%
      N 0.04 to 0.10%
      CEC 0.40 m.e. to 16.0 m.e. %
   (c) Mechanical analysis: Sandy loam to heavy clay. Other details—N.A.
14. Normal average rainfall in cm.:
   June 14.9  July 36.1  Aug. 34.1  Sept. 28.2  Oct. 20.9  Nov. 1.5  Dec. .1  Jan. 1.1
   Feb. 3.1  March 1.7  April 2.8  May 6.5  Total 151.0
   (The period on which the figures are based is 1956-1965.)
15. Irrigation facilities available:
   Canal and tank irrigation; since the inception of Institute.
   Year from which the facilities were made available:
   1946.
16. Whether any proper drainage system exists: Now being improved.
Object: To find out the effect of different levels of N, P, K and organic manures on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A./17.7.1955. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) 3 lb/ac. (d) 2 to 3. (v) Nil. (vi) T—1145 (medium). (vii) Irrigated. (viii) Interculture and hand weeding. (ix) 72.71. (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   4 organic manures as basal dressing: M0=Control (no B.D.), M1=Compost, M2=G.N.C. and M3=G.M.

   Sub-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N0=0, N1=40 and N2=80 lb/ac.
   (2) 3 levels of P0: P0=0, P1=50 and P2=100 lb/ac.
   (3) 3 levels of K0: K0=0, K1=30 and K2=60 lb/ac.

3. DESIGN:
   (i) 4 x 3 split-plot confd. (ii) (a) 4 main-plots/replication, 3 blocks/main-plot, each block consisting of 9 different combinations of NPK treatments confounding 2 d.f. of NPK interaction with blocks; 9 sub-plots/block. (b) N.A. (iii) 2. (iv) (a) 12’×30’ 10” (b) 10’ 6’x29’ 2’ (c) 2 lb/ac. (d) 7.5 lb/ac. (e) 3 lb/ac. (f) T-1145 (medium). (g) Irrigated. (h) Interculture and hand weeding. (i) N.A.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain and straw yield, height and tiller counts. (iv) (a) 1949—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1871 lb/ac. (ii) (a) 443.0 lb/ac. (b) 237.0 lb/ac. (iii) Main effect of N and interactions N×P and N×M are highly significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>K2</th>
<th>K1</th>
<th>K3</th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
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<td>2144</td>
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<td>2087</td>
<td>2002</td>
<td>2133</td>
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<td>2084</td>
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<td>N1</td>
<td>2197</td>
<td>2089</td>
<td>1840</td>
<td>2001</td>
<td>1999</td>
<td>2072</td>
<td>2026</td>
<td>2130</td>
<td>1954</td>
<td>2010</td>
<td>2032</td>
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<tr>
<td>N2</td>
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<td>1581</td>
<td>1288</td>
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<td>1937</td>
<td>1729</td>
<td>1827</td>
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<td>1858</td>
<td>1865</td>
<td>1924</td>
<td>1856</td>
<td>1832</td>
<td>1871</td>
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</table>

S.E. of difference of two

1. M marginal means
2. N, P or K marginal means
3. N, P or K means at the same level of M
4. M means at the same level of N, P or K
S.E. of body of N X P, P X K or N X K table
Object:—To find out the effect of different levels of N, P, K and organic manures on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 12 and 22.6.1956, 19.7.1956 and 1.8.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) 25 lb./ac. (d) 10°×9°. (e) 2 to 3. (v) Nil. (vi) T—1145 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 32.75°. (x) N.A.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 55(26) on page 1.

3. RESULTS:
   (i) 2156 lb./ac. (ii) (a) 870.0 lb./ac. (b) 200.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>K₂</th>
<th>K₃</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
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<td>2381</td>
<td>2245</td>
<td>2270</td>
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<td>2266</td>
<td>2294</td>
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<td>1684</td>
<td>1755</td>
<td>1711</td>
<td>1746</td>
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<tr>
<td>Mean</td>
<td>1943</td>
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<td>2099</td>
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<td>2061</td>
<td>2066</td>
<td>2111</td>
<td>2055</td>
<td>2094</td>
<td>2089</td>
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S.E. of difference of two
1. M marginal means = 142.0 lb./ac.
2. N, P or K marginal means = 40.0 lb./ac.
3. N, P or K means at the same level of M = 80.0 lb./ac.
4. M means at the same level of N, P or K = 156.3 lb./ac.
S.E. of body of N×P, P×K or N×K table = 49.0 lb./ac.

Crop:—Paddy (Kharif).
Site:—Central Rice Res. Inst., Cuttack.
Ref:—C.R.R.I. 57(27).
Type:—‘M’.

Object:—To find out the effect of different levels of N, P, K and organic manures on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A.
   (iv) (a) 4 ploughings, laddering and levelling. (b) N.A. (c) 25 lb./ac. (d) 10°×9°. (e) 2 to 3. (v) Nil. (vi) T—1145 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 28.47°. (x) N.A.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 55(26) on page 1.

3. RESULTS:
   (i) 2156 lb./ac. (ii) (a) 870.0 lb./ac. (b) 200.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.
Crop: Paddy (Kharij).

Site: Central Rice Res. Instt., Cuttack.

Object: To compare the efficiencies of sub-surface, surface and deep application of A/S at different levels on Paddy.

1. BASAL CONDITIONS:
   (i) Nil. (b) Paddy. (c) Nil. (d) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 19.6.1954 and 15.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) Try-1242 (late). (vii) Irrigated. (viii) 2 weedings. (ix) 55.24'. (x) 22 and 23.12.1954.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) 22. (b) N.A. (iii) 4. (iv) (a) 22'6" X 11'. (b) 20'10" X 9'4". (v) 10' around. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. Lodging on 22.11.1954. (ii) N.A. (iii) Yield of grain and straw, height, tiller counts and ear length measurements. (iv) (a) 1949—contd. (b) Yes. (c) Nil. (v) to (vi) Nil.
4

5. RESULTS:
(i) 2823 lb./ac. (ii) 269.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
<th>M₁₁</th>
<th>M₁₂</th>
<th>M₁₃</th>
<th>M₁₄</th>
<th>M₁₅</th>
<th>M₁₆</th>
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<th>M₁₈</th>
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<tr>
<td>Av. yield</td>
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<td>2611</td>
<td>2842</td>
<td>2581</td>
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Treatment

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<th>M₂₂</th>
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S.E./mean = 134.5 lb./ac.

Crop: Paddy (Kharif).
Ref: C.R.R.I. 55(4).
Site: Central Rice Res. Instt., Cuttack.
Type: M'.

Object: To study the effect of different methods of application of different levels of N on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 1-7.1955 N/A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) and (d) N/A. (e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 1 interculture. (ix) 7.73'. (x) N/A.

2. TREATMENTS:
Same as in exp. no. 51(6) on page 3.

5. RESULTS:
(i) 1941 lb./ac. (ii) 129.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac

<table>
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<th>M₁₀</th>
<th>M₁₁</th>
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<td>1707</td>
<td>1900</td>
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Treatment

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S.E./mean = 65.0 lb./ac.

Crop: Paddy (Kharif).
Ref: C.R.R.I. 56(4).
Site: Central Rice Research Inst., Cuttack.
Type: M'.

Object: To compare the efficiencies of sub-surface, surface and deep application of A/S at different levels on Paddy.

1. BASAL CONDITIONS:
(i) (a) N/A. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 22.6.1956/24.7.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N/A. (d) 10'x10'. (e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 8.73'. (x) 28 and 29.12.1956.

2. TREATMENTS:

<table>
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<tr>
<th>M₉</th>
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<th>M₁₃</th>
<th>M₁₂</th>
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<th>M₁₀</th>
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<td>t₃</td>
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<tr>
<td>M₂₁</td>
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<td>t₂</td>
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<td>t₃</td>
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<td>--</td>
<td>$\frac{1}{2}$ $S$</td>
<td>--</td>
<td>$\frac{1}{2}$ $S$</td>
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<td></td>
</tr>
</tbody>
</table>

$S =$ Surface application of 40 lb./ac. of N as A/S and $s =$ sub-surface application of 40 lb./ac. of N as A/S.
3. DESIGN:
   (i) R.B.D. (ii) (a) 21. (b) N.A. (iii) 4. (iv) (a) 19'2"x14'2". (b) 17'3"x12'2". (v) 10'9"x10'9". (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Attack of stem borer. Sprayed with folidol. (iii) Yield of grain and straw, height, tiller counts and ear-length measurements. (iv) (a) 1949—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 158.1 lb./ac. (ii) 147.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1136</td>
<td>1332</td>
<td>1451</td>
<td>1281</td>
<td>1497</td>
<td>1554</td>
<td>1744</td>
<td>1360</td>
<td>1642</td>
<td>2291</td>
<td>1550</td>
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<table>
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<tr>
<th>Treatment</th>
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<th>M₁₂</th>
<th>M₁₃</th>
<th>M₁₄</th>
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<th>M₁₆</th>
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<th>M₁₈</th>
<th>M₁₉</th>
<th>M₂₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1481</td>
<td>1681</td>
<td>1659</td>
<td>1559</td>
<td>1724</td>
<td>1856</td>
<td>1899</td>
<td>1870</td>
<td>1688</td>
<td>1965</td>
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</table>

S.E./mean = 73.9 lb./ac.

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**Crop :- Paddy (Kharif).**

**Ref :- C.R.R.I. 57(1).**

**Site :- Central Rice Res. Inst., Cuttack.**

**Type :- '9M'.**

Object — To assess the efficiency of split dose application of A/S and C/A/N against single dose application on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 21.6.1957/30.7.1957. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 10"x10". (e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.47'. (x) 23.12.1957.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁₀</th>
<th>M₁₁</th>
<th>M₁₂</th>
<th>M₁₃</th>
<th>M₁₄</th>
<th>M₁₅</th>
<th>M₁₆</th>
<th>M₁₇</th>
<th>M₁₈</th>
<th>M₁₉</th>
<th>M₂₀</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>1931</td>
<td>2170</td>
<td>2166</td>
<td>2145</td>
<td>2459</td>
<td>2921</td>
<td>2390</td>
<td>2938</td>
<td>3094</td>
<td>3279</td>
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<table>
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<th>M₁₁</th>
<th>M₁₂</th>
<th>M₁₃</th>
<th>M₁₄</th>
<th>M₁₅</th>
<th>M₁₆</th>
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<th>M₁₈</th>
<th>M₁₉</th>
<th>M₂₀</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2565</td>
<td>2633</td>
<td>2807</td>
<td>2842</td>
<td>2727</td>
<td>2883</td>
<td>2471</td>
<td>3015</td>
<td>2973</td>
<td>2830</td>
<td></td>
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</tbody>
</table>

S.E./mean = 100.9 lb./ac.
Crop: Paddy.
Site: Central Rice Res. Instt., Cuttack.
Object: To study the direct, residual and cumulative effects of compost on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 24.6.1958/14.8.1958. (iv) (a) 4 ploughings. (b) Transplanting. (c) 25 lb./ac. (d) 9"x9". (e) 2 to 3. (v) Nil. (vi) T—1242. (vii) Irrigated. (viii) 2 weedings. (ix) 56.7°. (x) 23.12.1958.

2. TREATMENTS:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>T&lt;sub&gt;1&lt;/sub&gt;</td>
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<td>Control</td>
<td>Control</td>
<td>Control</td>
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<td>T&lt;sub&gt;2&lt;/sub&gt;</td>
<td>Compost</td>
<td>No compost</td>
<td>Compost</td>
<td>No compost</td>
</tr>
<tr>
<td>T&lt;sub&gt;3&lt;/sub&gt;</td>
<td>Compost</td>
<td>Compost</td>
<td>No compost</td>
<td>Compost</td>
</tr>
<tr>
<td>T&lt;sub&gt;4&lt;/sub&gt;</td>
<td>Compost</td>
<td>Compost</td>
<td>No compost</td>
<td>Compost</td>
</tr>
<tr>
<td>T&lt;sub&gt;5&lt;/sub&gt;</td>
<td>Compost</td>
<td>Compost</td>
<td>No compost</td>
<td>No compost</td>
</tr>
<tr>
<td>T&lt;sub&gt;6&lt;/sub&gt;</td>
<td>Compost</td>
<td>Compost</td>
<td>Compost</td>
<td>No compost</td>
</tr>
<tr>
<td>T&lt;sub&gt;7&lt;/sub&gt;</td>
<td>A/S at 40 lb./ac. of N</td>
<td>A/S at 40 lb./ac. of N</td>
<td>A/S at 40 lb./ac. of N</td>
<td>A/S at 40 lb./ac. of N</td>
</tr>
</tbody>
</table>

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 30'x20'. (b) 28.5'x18.5'. (v) 0.75'x0.75'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Height, tillers measurements and yield of grain. (iv) (a) 1958—1962. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2104 lb./ac. (ii) 95.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

   | Treatment | T<sub>1</sub> | (T<sub>2</sub>+T<sub>3</sub>+T<sub>4</sub>+T<sub>5</sub>) | T<sub>6</sub> |
   | Av. yield | 2108 | 2092 | 2152 |
   | S.E. of T<sub>1</sub> or T<sub>6</sub> mean | = 47.5 lb./ac. |
   | S.E. of (T<sub>2</sub>+T<sub>3</sub>+T<sub>4</sub>+T<sub>5</sub>) mean | = 23.8 lb./ac. |

Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.
Object: To study the direct, residual and cumulative effects of compost on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 24.6.1959/14.8.1959. (iv) (a) 3 ploughings, laddering and running of puddler. (b) Transplanting. (c) 25 lb./ac. (d) 9"x9". (e) 2 to 3. (v) Nil. (vi) T—1242. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 49.35°. (x) 19.12.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 58(26) above.
4. GENERAL:
(i) Poor. (ii) Severe attack of blast towards the end of October when the crop was about to flower. (iii) Height, tillers and yield of grain. (iv) (a) 1958–1962. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Low rainfall in September and high rainfall in October. (vii) Severe blast at the time of flowering and untimely rains resulted in poor yield.

5. RESULTS:
(i) 1650 lb./ac. (ii) 233.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac. 

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃+T₄+T₅</th>
<th>T₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1585</td>
<td>1494</td>
<td>1697</td>
<td>1727</td>
</tr>
</tbody>
</table>

S.E. of T₁, T₂ or T₆ mean = 166.7 lb./ac.
S.E. of (T₃+T₄+T₅) mean = 67.4 lb./ac.

Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.
Ref: C.R.R.I. 59(11).
Type: 'M'.

Object: To study the direct, residual and cumulative effects of compost on Paddy.

1. BASAL CONDITIONS:
(i) (a) Fallow-Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 19.8.1959. (iv) (a) 2 ploughings by tractor. (b) Transplanting. (c) 25 lb./ac. (d) 9" x 6". (e) 2 to 3. (v) Nil. (vi) T-1242. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 7.94". (x) 26.12.1959.

2. TREATMENTS:
T₀=Control, T₁=Ammonium sulphate at 20 lb./ac. of N every year, T₂=Compost at 10 lb./ac. of N to be applied every year starting from 1959, T₃=Compost at 20 lb./ac. of N to be applied in alternate years starting from 1959 and T₄=Compost at 10 lb./ac. of N to be applied once in every four years starting from 1959.

3. DESIGN:
(i) R.B D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 30' x 24'. (b) 28' x 22'. (v) 1' x 9". (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Attack of blast towards the end of October when the crop was about to flower. (iii) Height, tillers and yield of grain. (iv) (a) 1959–1963. (b) Yes. (c) Nil. (vi) (a) and (b) Nil. (vii) Low rainfall in September and high rainfall in October. (viii) Attack of blast at the time of flowering and untimely rains resulted in poor yield.

5. RESULTS:
(i) 2117 lb./ac. (ii) 980 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₃</th>
<th>T₄</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1672</td>
<td>2520</td>
<td>1971</td>
<td>2230</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>49.0 lb./ac.</td>
<td></td>
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</tbody>
</table>

Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.
Ref: C.R.R.I. 58(1).
Type: 'M'.

Object: To assess the efficiencies of single and fractional placement of different forms of nitrogenous fertilizers on Paddy.

1. BASAL CONDITIONS:
2. TREATMENTS:

All combinations of (1) and (2) + 2 extra treatments
(1) 3 sources of 40 lb./ac. of N: S₁=S/A/S, S₂=C/A/N and S₃=Complexes supr
(2) 10 methods of application of N: M₁=Sub-surface application at planting, M₂=Sub-surface application one month after planting, M₃=Sub-surface application 3 weeks before flowering, M₄=Sub-surface application at planting, M₅=Sub-surface application at planting and 3 weeks before flowering, M₆=Sub-surface application at planting and 1 month after planting, M₇=Sub-surface application at planting and 3 weeks before flowering, M₈=Sub-surface application at planting and 1 month after planting and 3 weeks before flowering and M₉=Surface application at planting.

Extra treatments: T₀=Control and T₁=40 lb./ac. of P₂O₅.


3. DESIGN:

(i) R.B.D. (ii) (a) 32. (b) N.A. (iii) 3. (iv) (a) 21' x 9'9". (b) 19'6" x 8'3". (v) 0.75' x 0.75'. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1738 lb./ac. (ii) 234.2 lb./ac. (iii) S effect is highly significant. ('T₀+T₁) vs. others' is significant. (iv) Av. yield of grain in lb./ac.

\[ (T₀+T₁) = 1492 \text{ lb./ac.} \]

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
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<tbody>
<tr>
<td>S₁</td>
<td>1884</td>
<td>1704</td>
<td>1845</td>
<td>1729</td>
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<td>2005</td>
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<td>1569</td>
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<tr>
<td>S₂</td>
<td>1560</td>
<td>1459</td>
<td>1622</td>
<td>1542</td>
<td>1644</td>
<td>1726</td>
<td>1740</td>
<td>1769</td>
<td>1695</td>
<td>1571</td>
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<tr>
<td>S₃</td>
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<td>1657</td>
<td>1709</td>
<td>1836</td>
<td>1754</td>
<td>1678</td>
<td>1712</td>
<td>1867</td>
<td>1991</td>
<td>1605</td>
</tr>
<tr>
<td>Mean</td>
<td>1747</td>
<td>1610</td>
<td>1725</td>
<td>1702</td>
<td>1804</td>
<td>1803</td>
<td>1830</td>
<td>1830</td>
<td>1906</td>
<td>1582</td>
</tr>
</tbody>
</table>

S.E. of M marginal mean = 78.1 lb./ac.
S.E. of S marginal mean = 42.8 lb./ac.
S.E. of body of table = 135.2 lb./ac.
S.E. of (T₀+T₁) mean = 95.6 lb./ac.

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Crop :- Paddy (*Kharif*).
Ref :- C.R.R.I. 59(6).
Site :- Central Rice Res. Instt., Cuttack.
Type :- 'M'.

Object :- To assess the efficiency of single and fractional sub-surface application of different forms of nitrogenous fertilizers on Paddy.

1. BASAL CONDITIONS:

(i) (a) Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 24.6.1959/7.8.1959. (iv) (a) Tractor ploughing followed by iron plough. (b) Transplanting. (c) 25 lb./ac. (d) 5' x 6'. (e) 2 to 3. (v) Nil. (vi) T₁=242 (160 days duration). (vii) Irrigated. (viii) Interculture and hand weeding. (ix) 49.35'. (x) 15.12.1959.

2. TREATMENTS:

Same as in exp. no. 58(1) on page 7.
3. DESIGN:
  (i) R.B.D. (ii) (a) 32. (b) N.A. (iii) 3. (iv) (a) 18'×11'. (b) 16'×9'. (v) 0.75'×1'. (vi) Yes.

4. GENERAL:
  (i) Poor, lodging at pre-flowering time. (ii) Leaf roller towards beginning of October. Stem borer incidence in November. Spraying with Folidol for leaf roller. (iii) Height and tiller counts. (iv) (a) 19;8-l9 6 0. (b) Nil. (v) (a) and (b) Nil. (vi) Low rainfall in September and high rainfall in October. (vii) Untimely rainfall in October is responsible for poor yield as a result of lodging at pre-flowering time.

5. RESULTS:
  (i) 1620 lb./ac. (ii) 103.0 lb./ac. (iii) Main effects of M, S, interaction M×S and "(T0+T1) vs. others" are highly significant. (iv) Av. yield of grain in lb./ac. 

\[(T_0+T_1) = 1067 \text{ lb./ac.}\]

<table>
<thead>
<tr>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
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<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
<th>M11</th>
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<tbody>
<tr>
<td>1971</td>
<td>1803</td>
<td>1614</td>
<td>2133</td>
<td>1748</td>
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<tr>
<td>1571</td>
<td>1846</td>
<td>1400</td>
<td>1904</td>
<td>1448</td>
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<td>1849</td>
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<td>1482</td>
<td>1284</td>
<td>1382</td>
<td>1468</td>
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</tr>
</tbody>
</table>

Mean 1625 1701 1465 1827 1481 1637 1780 1735 1765 1451 1657

S.E. of M marginal mean = 34.3 lb./ac.
S.E. of S marginal mean = 18.8 lb./ac.
S.E. of body of table = 59.4 lb./ac.
S.E. of (T0+T1) mean = 42.0 lb./ac.

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.
Ref :- C.R.R.I. 58(74).

Object :- To study the effect of application of N in split doses on the yield of Paddy.

1. BASAL CONDITIONS:
  (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 7.7.1958/9.8.1958. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9'×6".
  (e) 2 to 3. (v) Nil. (vi) CO-13 (early). (vii) Irrigated. (viii) 57.94°. (ix) 5 and 6.11.1958.

2. TREATMENTS:
  12 stages of application of N : S0 = Control, S1 = 20 lb./ac. of N at puddling, S2 = 40 lb./ac. of N at puddling, S3 = 60 lb./ac. of N at puddling, S4 = 20 lb./ac. of N at ear initiation, S5 = 40 lb./ac. of N at ear initiation, S6 = 20 lb./ac. of N 15 days after transplanting, S7 = 20 lb./ac. of N 15 days after transplanting, S8 = 20 lb./ac. of N 15 days after transplanting, S9 = 20 lb./ac. of N at ear initiation, S10 = 40 lb./ac. of N 15 days after transplanting, S11 = 40 lb./ac. of N at puddling+20 lb./ac. of N 15 days after transplanting.

2. DESIGN:
  (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 30'×9'. (b) 28.5'×8'. (v) 0.75'×0.5'. (vi) Yes.

4. GENERAL:
  (i) Satisfactory. (ii) N.A. (iii) Grain yield and neck-infected tiller counts. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
  (i) 1412 lb./ac. (ii) 95.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.
Ref. - C.R.R.I. 59(19).
Type - 'M'.

Object: To study the effect of different levels of N and P on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Alluvial sandy loam. (b) Refer soil analysis, C.R.R.I., Cuttack.
(iii) 22.6.1959. (iv) (a) 3 to 4 ploughings followed by laddering. (b) Broadcast. (c) 54 lb./ac. (d) and (e) N.A. (v) \( K_2O \) at 27 lb./ac. (vi) PTB - 10. (vii) Unirrigated. (viii) Hand weeding. (ix) N.A. (x) 12.10.1959.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 levels of N as A/S: \( N_0 = 0 \), \( N_1 = 27 \), \( N_2 = 54 \) and \( N_3 = 81 \) lb./ac.
(2) 3 levels of \( P_2O_5 \) as Super: \( P_0 = 0 \), \( P_1 = 45 \) and \( P_2 = 90 \) lb./ac.

3. DESIGN:
(i) Fact. in R.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 13.1' x 18.0'. (b) 12.1' x 17.4' (v) 0.5' x 0.3'. (vi) Yes.

4. GENERAL:
(i) Fairly good. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 156 lb./ac. (ii) 216.8 lb./ac. (iii) N effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
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<th>( N_0 )</th>
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<th>( N_2 )</th>
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<td>( P_1 )</td>
<td>930</td>
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S.E. of P marginal mean = 54.2 lb./ac.
S.E. of N marginal mean = 61.6 lb./ac.
S.E. of body of table = 108.4 lb./ac.

Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.
Ref. - C.R.R.I. 59(20)
Type - 'M'.

Object: To study the effect of different levels of N and P on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow in rabi. (c) Nil. (ii) (a) Alluvial loam. (b) Refer soil analysis, C.R.R.I., Cuttack.
(iii) 12.6.1959/31.7.1959. (iv) (a) 2 summer ploughings and 1 puddling. (b) Transplanting. (c) N.A. (db. 10' x 6'). (e) 2 to 3. (v) \( K_2O \) at 26.8 lb./ac. (vi) PTB - 10. (vii) Irrigated. (viii) 2 intercultures. (ix) N.A. (x) 17.10.1959.

2. TREATMENTS:
Same as in exp. no. 59(19) above.
3. DESIGN:
(i) Conf. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 14.7' x 8.2'. (b) 17.7' x 6.6'. (v) One row al
around. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1712 lb./ac. (ii) 442.5 lb./ac. (i) N effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
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<th>N₂</th>
<th>N₃</th>
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<td>1834</td>
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S.E. of N marginal mean = 127.6 lb./ac.
S.E. of P marginal mean = 110.6 lb./ac
S.E. of body of table = 221.2 lb./ac

Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.
Ref: C.R.R.I. 58(25).
Type: 'M'.

Object: To study the effect of different levels of N, P and K with and without a basal dressing of compost on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 17.6.1958/21.8.1958. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) 25 lb./ac. (d) 9" x 9". (e) 2 to 3. (v) Nil. (vi) T=1145 (145 days duration). (vii) Irrigated. (viii) 2 to 3 intercultural with Japanese weeder and 1 hand weeding. (ix) 57.94". (x) 1 and 2.12.1958.

2. TREATMENTS:
Main-plot treatments:
- 2 levels of organic manure: C₀—No compost and C₁—Compost.

Sub-plot treatments:
- All combinations of (1), (2) and (3)
- (1) 3 levels of N: N₀=0, N₁=10 and N₂=80 lb./ac.
- (2) 3 levels of P₂O₅: P₀=0, P₁=50 and P₂=100 lb./ac.
- (3) 3 levels of K₂O: K₀=0, K₁=30 and K₂=60 lb./ac.

3. DESIGN:
(i) 2 x 3⁵ split-plot confld. (ii) (a) 2 main-plots/replication; 3 blocks/main-plot each block consisting of 9 different combinations of NPK treatments. Confounding 2 d.f. of NPK interaction with blocks; 9 sub-plots/block. (b) N.A. (iii) 2. (iv) (a) 30° 9" x 12". (b) 25° 9" x 10' 6". (v) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1958 lb./ac. (ii) (a) 297.0 lb./ac. (b) 184.7 lb./ac. (iii) Main effect of N and interactions C x N and C x K are highly significant. K effect is significant. (iv) Av. yield of grain in lb./ac.
Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.
Object :- To study the effect of different levels of N, P and K with and without a basal dressing of compost on Paddy.

1. BASAL CONDITIONS : 
(i) (a) Paddy—Fallow. (b) Paddy. (c) Nil. (ii) (a) Clav loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 1.7.1959/25.8.1959. (iv) (a) 1 summer ploughing, 2 puddlings, laddering and bund-making. (b) Transplanting. (c) 52 lb/ac. (d) 9"x9". (e) 2 to 3. (v) Nil. (vi) T—1145 (145 days). (vii) Irrigated. (viii) Intercultures. (ix) 45.04". (x) 27.11.1959.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 58(25) on page 11.

5. RESULTS:
(i) 2000 b./ac. (ii) (a) 433.5 lb./ac. (b) 291.7 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
<th>P₀</th>
<th>P₁</th>
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</table>

S.E. of difference of two
1. C marginal means = 57.2 lb./ac.
2. N, P or K marginal means = 43.5 lb./ac.
3. N, P or K means at the same level of C = 61.6 lb./ac.
4. C means at the same level of N, P or K = 76.1 lb./ac.
S.E. of body of N x P, P x K or N x K table = 53.3 lb./ac.

Ref :- C.R.R.I. 59(17).
Type :- 'M'.
**Crop** :- Paddy (2nd season).

**Site** :- Central Rice Res. Instit., Cuttack.

**Ref** :- C.R.R.I. 55(2)

**Type** :- 'M'.

Object :- To study the effect of different levels and sources of N on the yield of Paddy.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 12.12.1954 and 8.2.1955. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting (c) N.A. (d) 2 x 3. (v) N.A. (vi) TPB-10. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeders and 1 hand weeding. (ix) 35°. (x) N.A.

2. **TREATMENTS**:
   All combinations of (1) and (2) + control (2 plots)
   (1) 2 levels of N : N₁ = 20 and N₂ = 40 lb/ac.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 20' x 9'. (b) 15' x 7'/6'. (v) 6' x 9'. (vi) N.A. (vii) Yes.

4. **GENERAL**:
   (i) Good. (ii) Attack of blast. (iii) Height and ear-length measurements, number of tillers, grain and straw yield. (iv) (a) 1954–1955. (b) No. (c) N.A. (v) to (vii) N.A.

5. **RESULTS**:
   (i) 758 lb./ac. (ii) 100.9 lb./ac. (iii) Main effects of S, N and 'control is others' are highly significant. N x S interaction is significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
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<td>666</td>
<td>662</td>
<td>568</td>
<td>678</td>
<td>732</td>
<td>717</td>
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<tr>
<td>N₂</td>
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<td>834</td>
<td>851</td>
<td>919</td>
<td>938</td>
<td>549</td>
<td>682</td>
<td>594</td>
<td>842</td>
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</table>

Mean | 895 | 808 | 840 | 792 | 800 | 558 | 680 | 863 | 780   |

S.E. of S marginal mean = 35.7 lb./ac.
S.E. of N marginal mean = 17.8 lb./ac.
S.E. of body of table = 50.5 lb./ac.
S.E. of control mean = 35.7 lb./ac.

---

**Crop** :- Rice (Rabi).

**Site** :- Central Rice Res. Instit., Cuttack.

**Ref** :- C.R.R.I. 55(28).

**Type** :- 'M'.

Object :- To study the effect of different levels and sources of N on the yield of Paddy.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis C.R.R.I., Cuttack. (iii) 10.12.1955/31.1.1956 and 1.2.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) 21 lb./ac. (d) 6" X 9". (e) 2 to 3. (vi) Nil. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54 (2) on page 13.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain and straw, height and tiller counts. (iv) (a) 1954–1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1297 lb./ac. (ii) 166.0 lb./ac. (iii) Main effects of N, S and 'control vs. others' are highly significant. (iv) Av. yield of grain in lb./ac.

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<th>S3</th>
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<td>1452</td>
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S.E. of N marginal mean = 29.3 lb./ac.
S.E. of S marginal mean or control mean = 8.7 lb./ac.
S.E. of body of table = 81.0 lb./ac.
Crop: Paddy (Kharif).

Site: Central Rice Research Inst., Cuttack.

Ref: C.R.R.I. 55(23).

Type: 'M'.

Object: To study the residual effect of different levels and sources of N applied to previous Paddy crop on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments.
   (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.
   (iv) (a) 2 ploughings and 2 puddlings. (b) Transplanting.
   (c) N.A.
   (e) 2 to 3. (v) Nil. (vi) T = 141 (medium). (vii) Irrigated. (viii) Interplanting of hand weeding. (ix) 7.35'.
   (x) 1st week of December, 1955.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(3) on page 14.
   Treatments applied to the previous paddy crop.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Height and tiller counts, grain and straw yield. (iv) (a) Residual effect studied only in 1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1635 lb./ac. (ii) 66.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Control = 1616 lb./ac.

<table>
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S.E. of S marginal mean = 23.6 lb./ac.
S.E. of N marginal mean = 11.8 lb./ac.
S.E. of body of table or control mean = 33.4 lb./ac.

Crop: Paddy (Kharif).

Site: Central Rice Research Inst., Cuttack.

Ref: C.R.R.I. 55(2).

Type: 'M'.

Object: To study the effect of different levels and sources of N on the yield of Paddy.
1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A./19.7.1955. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 10' x 9'. (e) 2 to 3. (v) N.I. (vi) T—141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 2 hand weedicings. (ix) 72.71'. (x) N.A.

2. **TREATMENTS:**
   Same as in exp. no. 54(3) on page 14.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 45' x 5.83'. (b) 43'6" x 4'2". (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Not satisfactory. (ii) Stray incidence of stem borer. (iii) Height and ear-length measurements, number of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**
   (i) 3023 lb./ac. (ii) 140.5 lb./ac. (iii) Main effects of N, S and 'control vs. others' are highly significant. (iv) Av. yield of grain in lb./ac. 1608 lb./ac.

<table>
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S.E. of S marginal mean = 49.7 lb./ac.
S.E. of N marginal mean = 24.8 lb./ac.
S.E. of body of table or control mean = 70.2 lb./ac.

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**Crop:** Paddy (*Kharif*).  
**Site:** Central Rice Res. Instt., Cuttack.  
**Ref:** C.R.R.I. 56(2).  
**Type:** ‘M’.

Object: To study the effect of different levels and sources of N on the yield of Paddy.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 22.6.1956/28.7.1956. (iv) (a) 3 to 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9' x 10'. (e) 2 to 3. (v) N.I. (vi) T—141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 2 hand weedicings before flowering. (ix) 82.73'. (x) 9 and 10.12.1956.

2. **TREATMENTS:**
   Same as in exp. no. 54(3) on page 14.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 45' x 5'10". (b) 43'6" x 4'2". (v) 1 row around. (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory. (ii) Attacked by stem borer. Spraying with Folidol on 1.10.1956. (iii) Grain and straw yield. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**
   (i) 3065 lb./ac. (ii) 257.2 lb./ac. (iii) Main effects of S, N and 'control vs. others' are significant. (iv) Av. yield of grain in lb./ac.
Control = 2572 lb./ac.

\[
\begin{array}{ccccccccc|c}
 & S_1 & S_2 & S_3 & S_4 & S_5 & S_6 & S_7 & S_8 & \text{Mean} \\
N_1 & 2935 & 2713 & 3318 & 2918 & 3215 & 2706 & 2741 & 3004 & 2944 \\
N_2 & 3170 & 3117 & 3317 & 3481 & 3451 & 2638 & 3079 & 3331 & 3218 \\
\text{Mean} & 3153 & 2915 & 3418 & 3199 & 3333 & 2672 & 2740 & 3168 & 3096 \\
\end{array}
\]

S.E. of S marginal mean = 90.9 lb./ac.
S.E. of N marginal mean = 45.5 lb./ac.
S.E. of body of table or control mean = 128.6 lb./ac.

---

**Crop : Paddy (Kharif).**

**Site : Central Rice Res. Instt., Cuttack.**

**Ref : C.R.R.I. 57(15).**

**Type : `M`.**

Object : To study the effect of different levels and sources of N on the yield of Paddy.

1. **BASAL CONDITIONS :**
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 20.6.1957/31.7.1957. (iv) (a) 4 ploughings, liming and levelling. (b) Transplanting. (c) N.A. (d) 10" x 9". (e) 2 to 3. (v) Nil. (vi) T - 141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.47". (x) N.A.

2. **TREATMENTS :**
   Same as in expt. no. 54(3) on page 14.

3. **DESIGN :**
   (i) Fact. in R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) 45' x 5'10". (b) 43'6" x 4'10". (v) 1 row around. (vi) Yes.

4. **GENERAL :**
   (i) Satisfactory. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, grain and straw yield. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**
   (i) 2213 lb./ac. (ii) 264.0 lb./ac. (iii) Main effects of S, N and control vs. others are highly significant. (iv) Av. yield of grain in lb./ac.

\[
\begin{array}{ccccccccc|c}
 & S_1 & S_2 & S_3 & S_4 & S_5 & S_6 & S_7 & S_8 & \text{Mean} \\
N_1 & 2000 & 1888 & 2201 & 2534 & 2250 & 1543 & 1978 & 1598 & 2049 \\
N_2 & 2367 & 2167 & 2374 & 3124 & 2584 & 1625 & 2244 & 2517 & 2450 \\
\text{Mean} & 2184 & 2028 & 2488 & 2929 & 2417 & 1584 & 2111 & 2258 & 2250 \\
\end{array}
\]

S.E. of N marginal mean = 46.7 lb./ac.
S.E. of S marginal mean = 93.4 lb./ac.
S.E. of body of table or control mean = 132.0 lb./ac.

---

**Crop : Paddy (Kharif).**

**Site : Central Rice Res. Instt., Cuttack.**

**Ref : C.R.R.I. 58(2).**

**Type : `M`.**

Object : To study the effect of different levels and sources of N on the yield of Paddy.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.
(iii) 17.6.1958/26.7.58. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9'x9'.
(e) 2 to 3. (v) Nil. (vi) T—141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weed er and 1 hand weeding. (ix) 57.94". (x) 5.12.1958.

2. TREATMENTS:
All combinations of (1) and (2)+control (2 plots)
(1) 2 levels of N : N1=30 and N2=60 lb./ac.

3. DESIGN:
(i) Faci. in R.B. D. (ii) (a) 20. (b) N.A. (iii) 4. (iv) (a) 24'x9'. (b) 22'6"x7'6". (v) 1 row around.
(vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 296 lb./ac. (ii) 189.2 lb./ac. (iii) Main effects of S and N are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
<th>S7</th>
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<td>2953</td>
<td>2922</td>
<td>3085</td>
<td>2583</td>
<td>2741</td>
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</tbody>
</table>

S.E. of S marginal mean = 66.9 lb./ac.
S.E. of N marginal mean = 31.5 lb./ac.
S.E. of body of table = 94.6 lb./ac.
S.E. of control mean = 66.9 lb./ac.

Crop : Paddy (Kharij).
Site : Central Rice Res. Inst., Cuttack.

Ref : C.R.R.I. 59(7).
Type : 'M'.

Object : To assess the efficiency of various nitrogenous fertilizers and complex fertilizers on Paddy.

1. BASAL CONDITIONS:
(i) (a) Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.
(iii) 24.6.1959/18.8.1959. (iv) (a) 3 ploughings and 1 puddling. (b) Transplanting. (c) 25 lb./ac.
(d) 9'x6'. (e) 2 to 3. (v) Nil. (vi) T—141 (150 days duration). (vii) Irrigated. (viii) Interculture and hand weeding. (ix) 49.4". (x) 4.12.1959.

2. TREATMENTS:
All combinations of (1) and (2)+5 extra treatments
(1) 2 levels of N : N1=30 and N2=60 lb./ac.

Extra treatments : T0=Control, T1=30 lb./ac. of N as A/S+30 lb./ac. of P2O5 as Super, T2=60 lb./ac. of N as A/S+60 lb./ac. of P2O5 as Super, T3=T1+30 lb./ac. of K2O and T4=T2+60 lb./ac. of K2O.

3. DESIGN:
(i) R.B.D. (ii) (a) 25. (b) N.A. (iii) 3. (iv) (a) 22"x15'. (b) 21"x13'. (v) 9"x1'. (vi) Yes.
4. GENERAL:
(i) Fair. (ii) Nil. (iii) Tiller count, yield of grain and straw. (iv) (a) 1949—contd. (modified in 1959). (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Low rain in Sept. and heavy rain in Oct. (vii) Nil.

5. RESULTS:
(i) 2262 lb./ac. (ii) 151 lb./ac. (iii) Main effect of S, N and SxN interaction and 'control vs others' are highly significant. (iv) Av. yield of grain in lb./ac.

\[ T_8 = 1486 \text{ lb./ac.}, T_4 = 2119 \text{ lb./ac.}, T_2 = 2759 \text{ lb./ac.}, T_3 = 2377 \text{ lb./ac. and } T_5 = 2079 \text{ lb./ac.} \]

<table>
<thead>
<tr>
<th></th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
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<th>S_7</th>
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<td>1820</td>
<td>2252</td>
<td>1805</td>
<td>1752</td>
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<td>2053</td>
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<td>2990</td>
<td>1995</td>
<td>2064</td>
<td>2287</td>
<td>2377</td>
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<td>2193</td>
<td>1805</td>
<td>2621</td>
<td>1900</td>
<td>1928</td>
<td>2126</td>
<td>2215</td>
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</table>

S.E. of N marginal mean = 27.6 lb./ac.
S.E. of S marginal mean = 61.6 lb./ac.
S.E. of body of table or any extra treatment mean = 87.2 lb./ac.

Crop = Paddy (Kharif and 2nd crop).
Site = Central Rice Res. Instt., Cuttack.
Ref = C.R.R.I. 57(21).
Type = 'M'.

Object:—To determine the effects of different levels of N and their combination with P and K on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A.
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) and (d) N.A. (e) 2 to 3. (v) Nil.
(vi) BAM. 9 (late) kharif crop and MTU. 15 (early) second crop. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.47'. (a) N.A.

2. TREATMENTS:
6 manurial treatments: T_0 = Control, T_1 = 30 lb./ac. of N, T_2 = 30 lb./ac. of N + 30 lb./ac. of P_2O_5; T_3 = T_2 + 30 lb./ac. of K_2O, T_4 = 45 lb./ac. of N + 60 lb./ac. of P_2O_5 and T_5 = T_4 + 90 lb./ac. of K_2O.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 66' x 20'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
Yield of kharif crop
(i) 3188 lb./ac. (ii) 181.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

\[ \text{Av. yield} = \frac{3204 + 3247 + 3227 + 3119 + 3393 + 3036}{6} = 3215 \text{ lb./ac.} \]

Yield of 2nd crop
(i) 2164 lb./ac. (ii) 169.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.
### Treatment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
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<td>2142</td>
<td>2169</td>
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<td>2308</td>
<td>2273</td>
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</table>

S.E./mean = 84.8 lb/ac.

#### Crop: Paddy (Kharif)

#### Site: Central Rice Res. Instt., Cuttack

Object: To study the effect of different levels of N and their combinations with P and K on the yield of Paddy.

1. **Basal Conditions:**
   (i) (a) Nil. (b) Paddy. (c) N.A.  
   (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (c) N.A.  
   (iii) N.A.  
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) and (d) N.A. (e) 2 to 3. (v) Nil.  
   (vi) TAM-9 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.47°.  

2. **Treatments:**

3. **General:**

4. **Results:**
   (i) 232 lb/ac.  
   (ii) 248.1 lb/ac.  
   (iii) Treatment differences are not significant.  
   (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
</tr>
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<tbody>
<tr>
<td></td>
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<td>2285</td>
<td>2657</td>
<td>2558</td>
<td>2714</td>
<td>2607</td>
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</tbody>
</table>

S.E./mean = 124.0 lb/ac.

#### Crop: Paddy (Kharif)

#### Site: Central Rice Research Inst., Cuttack

Object: To study the effect of different levels of N and their combinations with P and K on the yield of Paddy.

1. **Basal Conditions:**
   (i) (a) Nil. (b) Paddy. (c) N.A.  
   (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (c) N.A.  
   (iii) N.A.  
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) and (d) N.A. (e) 2 to 3. (v) Nil.  
   (vi) T 141—89. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.47°. (x) N.A.  

2. **Treatments:**

3. **Design:**
   (i) R.B.D.  
   (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A.  
   (b) 99' × 10'. (v) N.A. (vi) Yes.

4. **General:**
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. **Results:**
   (i) 2378 lb/ac.  
   (ii) 212.3 lb/ac. (iii) Treatment differences are highly significant.  
   (iv) Av. yield of grain in lb/ac.
Object: To study the effect of different levels of N and their combinations with P and K on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) and (d) N.A. (e) 2 to 3. (v) Nil.
   (vi) T 141—49. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 57.94'. (a) N.A.

2. TREATMENTS:
   Same as in exp. no. 57(2) on pág: 17.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 99'×10'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1730 lb./ac. (ii) 165.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_9</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
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<td>1679</td>
<td>1778</td>
<td>1835</td>
<td>1835</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>67.4</td>
<td></td>
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</tbody>
</table>

Object: To study the effect of growing Dhaincha with broadcast Paddy and incorporation of Dhaincha in the field 6 to 8 weeks later at the time of brashening with and without P and N.

6. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 22.6.1954.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Broadcast. (c) Paddy at 80 lb./ac and dhaincha at 25 lb./ac. (d) and (e) N.A. (v) Nil. (vi) T—1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 55.34'. (x) 24 to 16.12.1954.

7. TREATMENTS:
   12 manurial treatments: T_1=Paddy unmanured, T_2=Growing dhaincha with Paddy, T_3=Paddy with top-dressing of 20 lb./ac. of N, T_4=T_3 with basal dressing of 20 lb./ac. of N, T_5=T_4 with top dressing of 20 lb./ac. of N, T_6=T_5 with top dressing of 10 lb./ac. of N and basal dressing of 10 lb./ac. of N, T_7=T_6 with top dressing of 10 lb./ac. of P_2O_5 and basal dressing of 10 lb./ac. of P_2O_5, T_8=T_7 with 50 lb./ac. of P_2O_5 and top dressing of 20 lb./ac. of N, T_9=T_8 with 50 lb./ac. of P_2O_5, T_10=T_9 with 50 lb./ac. of P_2O_5 and top dressing of 10 lb./ac. of N and top dressing of 10 lb./ac. of N and top dressing of 10 lb./ac. of N and 10 lb./ac. of N, T_11=T_10 with 20 lb./ac. of P_2O_5 and top dressing of 10 lb./ac. of N.

N applied as A/S and P_2O_5 as Super. Dhaincha broadcast with paddy and applied as G.M. after 6 to 8 weeks.
3. DESIGN:
(i) R.B.D.  (ii) a) 12.  (b) N.A.  (iii) 4.  (iv) a) 30'×20'.  (b) 20'×18'.  (v) 1'×1'.  (vi) Yes.

4. GENERAL:
(i) Satisfactory.  (ii) Nil.  (iii) Yield of grain and straw, height, tiller counts and ear-length measurements, (iv) (a) 1953-1957 (not conducted during 1956).  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
(i) 2742 lb./ac.  (ii) 315.0 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
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<td>2748</td>
<td>3133</td>
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<tr>
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</table>

Crop = Paddy (Kharif).
Site = Central Rice Res. Inst., Cuttack.
Ref = C.R.R.I. 55(10).
Type = 'M'.

Object: To study the effect of growing dhaincha with broadcast Paddy and incorporation of dhaincha in the field 6 to 8 weeks later at the time of beushenning with and without P and N.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Paddy.  (c) Nil.  (ii) (a) Clay loam.  (b) Refer soil analysis, C.R.R.I., Cuttack.  (iii) 10.6.1955/2.8.1955.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Broadcast.  (c) 50 lb./ac.  (d) and (e) Nil.  (v) Nil.  (vi) T-1242 (late).  (vii) Irrigated.  (viii) 2 to 3 intercultures with Japanese weeder and hand weeding.  (ix) 72.71'.  (x) 19.12.1955.

2. TREATMENTS:
12 manurial treatments:
- T1 = Paddy unmanured.
- T2 = Paddy beushenened.
- T3 = Paddy with top dressing of 10 lb./ac. of N.
- T4 = Paddy with top dressing of 20 lb./ac. of N.
- T5 = Paddy with top dressing of 15 lb./ac. of P2O5 and top dressing of 10 lb./ac. of N.
- T6 = Growing dhaincha with paddy.
- T7 = T6 with top dressing of 10 lb./ac. of N.
- T8 = T6 with top dressing of 15 lb./ac. of P2O5 and top dressing of 20 lb./ac. of N.
- T9 = T6 with top dressing of 15 lb./ac. of P2O5 and top dressing of 10 lb./ac. of N.
- T10 = T6 with top dressing of 50 lb./ac. of P2O5.
- T11 = T6 with top dressing of 50 lb./ac. of P2O5 and top dressing of 20 lb./ac. of N.
- T12 = T6 with top dressing of 50 lb./ac. of P2O5 and top dressing of 10 lb./ac. of N.

3. DESIGN:
(i) R.B.D.  (ii) a) 12.  (b) N.A.  (iii) 4.  (iv) a) 30'×20'.  (b) 25'×18'.  (v) 1'×1'.  (vi) Yes.

4. GENERAL:
(i) Good.  (ii) Nil.  (iii) Height, tiller and ear-length measurements and yield of straw and grain.  iv) (a) 1953—cond not conducted during 1956.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
(i) 1988 lb./ac.  (ii) 249.0 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
<th>T12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1802</td>
<td>1791</td>
<td>1838</td>
<td>2083</td>
<td>2156</td>
<td>2029</td>
<td>2210</td>
<td>2095</td>
<td>2116</td>
<td>1969</td>
<td>2109</td>
<td>2156</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>124.5 lb./ac.</td>
<td></td>
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</tr>
</tbody>
</table>
Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.

Object :- To study the effect of growing dhaincha with broadcast paddy and incorporation of dhaincha in the field 6 to 8 week later at the time of harvesting with and without P and N.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 12.6.1957/N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Broadcast. (c) 60 lb./ac. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T=1242 (late). (vii) Integrated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.47°. (a) 30.12.1957.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 55(10) on page 22.

5. RESULTS:
(i) 1759 lb./ac. (ii) 177.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
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<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
<th>T12</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1268</td>
<td>1433</td>
<td>1080</td>
<td>1705</td>
<td>1743</td>
<td>1721</td>
<td>1749</td>
<td>2078</td>
<td>1941</td>
<td>1717</td>
<td>1982</td>
<td>2089</td>
</tr>
</tbody>
</table>

S.E./mean = 88.6 lb./ac.

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.

Object :- To assess the relative efficiency of different nitrogeneous fertilizers on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 25.11.1957/18.1.1958. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9'x6". (e) 2 to 3. (v) Nil. (vi) MTU-15. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 39°47'. (a) 20.4.1958.

2. TREATMENTS:
All combinations of (1), (2) and (3)+3 extra treatments
(1) 3 levels of N : N₀ =0, N₁ =40 and N₂ =80 lb./ac.
(2) 3 levels of P₂O₅ : P₀ =0, P₁ =50 and P₂ =100 lb./ac.
(3) 3 sources of N : S₁ =AJS, S₂ =C/AJN and S₃ =Urea.
3 extra treatments : T₁ =40 lb./ac. of N₀+50 lb./ac. of P₀₂O₅+20 lb./ac. of K₂O, T₂ =40 lb./ac. of N₀+50 lb./ac. of P₀₂O₅+40 lb./ac. of K₂O and T₃ =40 lb./ac. of N₀+50 lb./ac. of P₀₂O₅+60 lb./ac. of K₂O.

3. DESIGN:
(i) 3 confd.+3 extra treatments/block. (ii) (a) 12 plots/block and 3 blocks/replication. (b) N.A. (iii) 2.
(iv) (a) 20'x15'. (b) 18'x13.5'. (v) 1'x9'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. Lodging on 30.3.1958. (ii) Attack of stem borer. Spraying with Endrin. (iii) Straw height, tiller and ear-length measurements and yield of grain. (iv) (a) and (b) N.A. (c) No. (v) to (vii) Nil.

5. RESULTS:
(i) 2143 lb./ac. (ii) 1760 lb./ac. (iii) N effect is highly significant. S effect is significant. (iv) Av. yield of grain in lb./ac.
Crop: Paddy (*Kharif*).

Site: Central Rice Res. Instt., Cuttack.

Object: To determine the effects of N, P and K on the yield of Paddy.

Ref: C.R.R.I. 57(22).

Type: *M*.

### BASAL CONDITIONS:

1. (i) Nil. (b) Paddy. (c) N.A. (i) (a) Nil. (b) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A.
2. (iv) 4 ploughings, laddering and levelling. (b) Transplanted. (c) and (d) N.A. (e) 2 to 3. (v) Nil.
3. (vi) T 141—89. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.47'. (x) N.A.

### DESIGN:

(i) R.B.D. (ii) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 99' × 21'. (v) N.A. (vi) Yes.

### GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 197—contd. (b) No. (c) Nil. (v) to (vii) Nil.

### RESULTS:

(i) 2449 lb./ac. (ii) 1231 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;0&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>2470</td>
<td>2487</td>
<td>2391</td>
</tr>
</tbody>
</table>

S.E./mean = 50.3 lb./ac.

---

Ref: C.R.R.I. 58(21).

Type: *M*.

Crop: Paddy (*Kharif*).

Site: Central Rice Res. Instt., Cuttack.

Object: To determine the effects of N, P and K on the yield of Paddy.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) and (d) N.A. (v) (a) T-141—89. (vi) Irrigated. (vii) 2 to 3 intercultural Japanese weeder and hand weeding. (ix) 57.94°. (x) N.A.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 57(22) on page 24.

3. RESULTS:
   (i) 2031 lb./ac. (ii) 315.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

   \[
   \begin{array}{ccc}
   \text{Treatment} & N_0 & N_1 & N_2 \\
   \text{Av. yield} & 1823 & 2148 & 2122 \\
   \text{S.E./mean} & 128.7 lb./ac. \\
   \end{array}
   \]

---

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Inst., Cuttack.
Ref :- C.R.R.I. 54(4).
Type :- 'M'.

Object :- To study the effect of continuous application of A/S with different levels of lime and compost on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) N.A. (iii) 23.6.1954/7 8.1954. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10° to 6°. (e) 2 to 3. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 55.24°. (x) 23.11.1954.

2. TREATMENTS:
   Treatments in one direction:
   2 levels of compost: C_0 = 0 and C_1 = 100 mda/ac.
   Treatments in perpendicular direction:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S:
      N_0 = 0, N_1 = 20 and N_2 = 40 lb./ac.
   (2) 3 levels of lime: L_0 = 0, L_1 = 4 and L_2 = 8 cwt/ac.
   Manure applied on 24.8.1954.

3. DESIGN:
   (i) Strip-plot. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 15' x 12'. (b) 18' x 10'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw; height, tiller count and ear-length measurements. (iv) (a) 1948—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2696 lb./ac. (ii) (a) 85 lb./ac. for (C). (b) 188 lb./ac. for (NL). (c) 168 lb./ac. for (C×NL). (iii) Main effects of N and C are highly significant. Interaction N×C is significant. (iv) Av. yield of grain in lb./ac.

\[
\begin{array}{ccc|ccc|ccc}
|   & L_0 & L_1 & L_2 & \text{Mean} & C_0 & C_1 & \text{Mean} | \\
| N_0 & 2233 & 2330 & 2350 & 2304 & 1990 & 2618 | \\
| N_1 & 2779 & 2820 & 2811 & 2803 & 2639 & 2967 | \\
| N_2 & 2970 & 2924 & 3047 & 2980 & 2785 & 3176 | \\
| \text{Mean} & 2660 & 2691 & 27.6 & 2696 & 2471 & 2920 | \\
| C_0 & 2462 & 2470 & 2482 & | & & | \\
| C_1 & 2859 & 2912 & 2990 & | & & | \\
\end{array}
\]
S.E. of difference of two

1. C marginal means = 20.0 lb./ac.
2. N or L marginal means = 54.3 lb./ac.
3. N or L means at the same level of C = 72.8 lb./ac.
4. C means at the same level of N or L = 59.3 lb./ac.
S.E. of body of N x L table = 66.5 lb./ac.

Crop :- Paddy (Kharif).

Site :- Central Rice Res. Inst., Cuttack.

Object :- To study the effect of continuous application of A/S with different levels of lime and compost on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 10.6.1955/4.8.1955. (iv) (a) 4 ploughings, laddering and leveling. (b) Transplanted. (c) N.A. (d) 10'x6'. (e) 2 to 3. (v) Nil. (vi) T—1145 (medium). (vii) Irrigated. (viii) 2 intercultures. (ix) 72.71°. (x) 24/11.1955.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(4) on page 21.

4. GENERAL:
   (i) Good. Lodging on 29.10.1955. (ii) Incidence of leaf roller. (iii) Yield of grain and straw, height, tiller and ear-length measurements. (iv) (a) 1916—coad. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (ii) 2066 lb./ac. (ii) (a) 11.0 lb./ac. for (C). (b) 133.0 lb./ac. for (NL). (c) 91.0 lb./ac. for (CxN). (iii) Main effects of C, N and interaction C x N are highly significant. (iv) A.v. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₀</th>
<th>L₁</th>
<th>L₂</th>
<th>Mean</th>
<th>C₀</th>
<th>C₁</th>
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<tr>
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<td>1783</td>
<td>1722</td>
<td>1753</td>
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<tr>
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<td>2172</td>
<td>2208</td>
<td>2183</td>
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<td>2237</td>
<td>2286</td>
<td>2260</td>
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Mean 2066 2064 2072

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<th>L₂</th>
<th>Mean</th>
<th>C₀</th>
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<td>1874</td>
<td>1918</td>
<td>1906</td>
<td>2226</td>
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<tr>
<td>C₁</td>
<td>2197</td>
<td>2254</td>
<td>2226</td>
<td></td>
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</tbody>
</table>

S.E. of difference of two

1. C marginal means = 7.3 lb./ac.
2. N or L marginal means = 38.4 lb./ac.
3. N or L means at the same level of C = 46.5 lb./ac.
4. C means at the same level of N or L = 31.2 lb./ac.
S.E. of body of N x L table = 47.0 lb./ac.

Crop :- Paddy (Kharif).

Site :- Central Rice Res. Inst., Cuttack.

Object :- To study the effect of continuous application of A/S with different levels of lime and compost on the yield of Paddy.

Ref :- C.R.R.I. 55(3).
Type :- ‘M’.

Ref :- C.R.R.I. 56(3).
Type :- ‘M’.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.
   (iii) 25.6.1956/4.8.1956. (iv) (a) 4 ploughings, ladder and levelling. (b) Transplanted. (c) N.A. (d) 10" x 6".
   (e) 2 to 3. (v) Nil. (vi) T—1145 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 82.73°. (x) 26 to 28.11.1956.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(4) on page 24.

4. GENERAL:
   (i) Satisfactory. Lodging in heavily manured plots. (ii) Mild attack of blast. Sprayed with Folidol. (iii) Yield of grain and straw, height, tiller counts and ear-length measurements. (iv) (a) 1948—contd. (b) Yes. (c) Nil. (d) L to (vii) Nil.

5. RESULTS:
   (i) 2379 lb./ac. (ii) (a) 267 lb./ac. for (C). (b) 151 lb./ac. for (L). (c) 141 lb./ac. for (C x N). (iii) Main effects of C, N and interaction C x N are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L_3</th>
<th>L_4</th>
<th>L_5</th>
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</table>

S.E. of difference of two
1. C marginal means  = 62.9 lb./ac.
2. N or L marginal means = 43.6 lb./ac.
3. N or L means at the same level of C = 59.6 lb./ac.
4. C means at the same level of N or L = 78.5 lb./ac.
S.E. of body of N x L table = 53.4 lb./ac.

Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.
Object: To study the effect of continuous application of A/S with different levels of lime and compost on the yield of Paddy.

Ref: C.R.R.I. 57(18). Type: M'.
4. GENERAL:
(i) Satisfactory. Lodging occurred in some plots. (ii) Attack of leaf roller controlled. (b) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2733 lb./ac. (ii) (a) 117 lb./ac. for (C). (b) 243 lb./ac. for (NL). (c) 250 lb./ac. for (C×NL). (iii) Main effects of C, N and interaction C×N are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₀</th>
<th>L₁</th>
<th>L₂</th>
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<td>2692</td>
<td>2741</td>
<td>2733</td>
<td>2578</td>
<td>2888</td>
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</tbody>
</table>

S.E. of difference of two
1. C marginal means = 27.6 lb./ac.
2. N or L marginal means = 70.1 lb./ac.
3. N or L means at the same level of C = 122.7 lb./ac.
4. C means at the same level of N or L = 87.8 lb./ac.
S.E. of body of N×L table = 85.9 lb./ac.

Crop - Paddy (Kharif).
Site - Central Rice Res. Instt., Cuttack.
Ref - C.R.R.I. 58(23).
Type - ‘M’.

Object:—To study the effect of continuous application of A/S with different levels of lime and compost on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (b) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 24.6.1958/11.8.1958. (iv) (a) 4 ploughings, ladder ing and levelling. (b) Transplanted. (c) 25 lb./ac. (d) 10"×6". (e) 2 to 3. (f) Nil. (g) T=1145 (medium). (h) Irrigated. (i) Inter-culture and hand weeding. (j) 15.7.59. (k) 24 and 25.11.1958.

2. TREATMENTS:
Same as in exp. no. 54(4) on page 24.

3. DESIGN:
(i) Strip-plot. (ii) (a) 2 strips in one direction and 9 strips in the perpendicular direction. (b) N.A. (iii) 4. (iv) (a) 30’×11’. (b) 28’×10’. (v) 1’×10’. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Attack of mealy bugs. Controlled by spraying Folidol on 29.9.1958. (iii) Yield of straw, grain, height, tiller count and ear-length measurements. (iv) (a) 1948—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2582 lb./ac. (ii) (a) 117.6 lb./ac for (C). (b) 203.0 lb./ac. for (NL). (c) 122.4 lb./ac. for (C×NL). (iii) Main effects of N, C and interaction N×C are highly significant. (iv) Av. yield of grain in lb./ac.
Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.
Type: 'M'.

Object: To study the effect of continuous application of A/S with different levels of lime and compost on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.
   (iii) 2.7.1959/5.8.1959. (iv) (a) 2 puddlings and laddering. (b) Transplanted. (c) 25 lb./ac. (d) 15' x 6'.
   (e) 2 to 3. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2 weedings by Japanese weeder. (ix) 45.05'. (x) 2111.1959.

2. TREATMENTS:
   Same as in expt. no. 54(4) on page 24.

3. DESIGN:
   (i) Strip-plot. (ii) (a) 2 strips in one direction and 9 strips in the perpendicular direction. (b) N.A. (iii) 4.
   (iv) (a) 30' x 11'8'. (b) 28' x 0'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
   (i) Fairly good. (ii) Blast disease in heavily manured plots. (iii) Height, tiller count and yield of grain.
   (iv) (a) 1948 - contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Abnormally heavy rains in October.
   (vii) Nil.

5. RESULTS:
   (i) 2165 lb./ac. (ii) 490 lb./ac. for (Cl). (b) 158 lb./ac. for (NL). (c) 237 lb./ac. for (CXL). (ii) N effect
   is highly significant. L effect and interaction C x N are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
<th>C0</th>
<th>C1</th>
</tr>
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<tr>
<td>L0</td>
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<td>2198</td>
<td>2356</td>
<td>2165</td>
<td>2103</td>
<td>2140</td>
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<tr>
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<td>2274</td>
<td>2446</td>
<td>2165</td>
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<tr>
<td>L2</td>
<td>1880</td>
<td>2265</td>
<td>2607</td>
<td>2165</td>
<td>2103</td>
<td>2140</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. C marginal means
2. N or L marginal means
3. N or L means at the same level of C
4. C means at the same level of N or L

S.E. of body of N x L table

27.7 lb./ac. 58.0 lb./ac. 67.9 lb./ac. 49.3 lb./ac. 71.1 lb./ac.
S.E. of difference of two
1. C marginal means = 115.5 lb./ac.
2. N or L marginal means = 57.2 lb./ac.
3. N or L means at the same level of C = 103.9 lb./ac.
4. C means at the same level of N or L = 139.9 lb./ac.
S.E. of body of NXL table = 70.0 lb./ac.

Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.
Ref.: C.R.R.I. 54(20).
Type: -0M'.

Object: -To study the influence of deep placement of A/S in combination with P with or without lime on the yield of Paddy in low land soil.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 19.6.1954/16.7.1954. (iv) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10' X 10', (e) 2 to 3. (v) Nil. (vi) T=1241 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japan wender and 1 hand weeding. (ix) 55.24'.

2. TREATMENTS:
Main-plot treatments:
2 levels of lime: \( L_0 = 0 \) and \( L_1 = 2000 \) lb./ac.
Sub-plot treatments:
3 levels of P as Super: \( P_0 = 0 \), \( P_1 = 50 \) and \( P_2 = 100 \) lb./ac.
Sub-sub-plot treatments:
3 levels of N as A/S: \( N_0 = 0 \), \( N_1 = 20 \) and \( N_2 = 40 \) lb./ac.
Lime and Super applied on 16.7.1954 and 23.6.1954 respectively.

3. DESIGN:
(i) Split plot. (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) \( 13'5' X 47'6' \). (iii) 4. (iv) (a) 21'8" X 15'10". (b) \( 17'6" X 14'2" \). (v) \( 2'1" X 10' \). (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Height, tiller counts, grain and straw yield. (iv) (a) N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2650 lb./ac. (ii) (a) 394 lb./ac. (b) 479 lb./ac. (c) 176 lb./ac. (iii) Main effects of N and L are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
<th>Mean</th>
<th>( L_0 )</th>
<th>( L_1 )</th>
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<td>2682</td>
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<td>2401</td>
<td>2918</td>
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<td>2789</td>
<td>3146</td>
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<td>2722</td>
<td>2669</td>
<td>2650</td>
<td>2420</td>
<td>2880</td>
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<tr>
<td>( L_0 )</td>
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<td>2441</td>
<td></td>
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<tr>
<td>( L_1 )</td>
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<td>3009</td>
<td>2897</td>
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</tbody>
</table>

S.E. of difference of two
1. L marginal means = 92.9 lb./ac. 6. N means at the same level of L = 71.7 lb./ac.
2. P marginal means = 138.3 lb./ac. 7. L means at the same level of N = 109.8 lb./ac.
3. N marginal means = 50.8 lb./ac. 8. N means at the same level of P = 87.8 lb./ac.
4. P means at the same level of L = 195.6 lb./ac. 9. P means at the same level of N = 155.8 lb./ac.
5. L means at the same level of P = 184.7 lb./ac.
Crop: Paddy (Kharif)

Site: Central Rice Res. Instt., Cuttack.

Object: To compare the efficiency of surface and sub-surface application of different sources of N at planting and one month after planting on Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil, (b) Paddy, (c) N.A. (ii) (a) Clay loam, (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 10.6.1955/17.7.1955. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 1050 x 9'. (e) 2 to 3. (vi) Nil. (vii) BAM—9 (late). (viii) Irrigated. (ix) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (x) 25.12.1955.

2. TREATMENTS:

All combinations of (1) and (2) + a control

(1) 4 sources of 30 lb./ac. of N: S1 = A/S, S2 = Ammon., S3 = A/C and S4 = Urea.

(2) 5 methods of application of fertilizers: M1 = Dry sub-surface, M2 = Sub-surface at planting, M3 = Sub-surface (pellet) at planting, M4 = Surface application one month after planting and M5 = Sub-surface (pellet) one month after planting.

3. DESIGN:

(i) R.B.D. (ii) (a) 21. (b) 132' x 64.5'. (iii) 4. (iv) (a) 42.5' x 7.5'. (b) 40.83' x 6.0'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (b) N.A. (iii) Yield of grain and straw, height and tiller counts. (iv) (a) N.A. (b) No. (e) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(ii) 253.9 lb./ac. (ii) 111.1 lb./ac. (iii) ‘Control vs. others’ is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
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<td>2610</td>
<td>2448</td>
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</table>

S.E. of S marginal mean = 24.8 lb./ac.
S.E. of M marginal mean = 27.8 lb./ac.
S.E. of body of table or control mean = 55.6 lb./ac.

Crop: Paddy (Kharif)

Site: Central Rice Res. Instt., Cuttack.

Object: To compare the efficiency of surface and sub-surface application of different sources of N at planting and one month after planting on Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil, (b) Paddy, (c) N.A. (ii) (a) Clay loam, (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 25.6.1956/16.8.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 1050 x 9'. (e) 2 to 3. (vi) Nil. (vii) BAM—9. (viii) Irrigated. (ix) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (x) 25.12.1955.
2. TREATMENTS

All combinations of (1) and (2) + control

(1) 4 sources of 30 lb./ac. of N: S1 = A/S, S2 = Ammono Phos, S3 = A/C and S4 = Urea.

(2) 5 methods of application of N: M1 = Surface application one month after planting, M2 = Sub-surface (pellet) at planting, M3 = Sub-surface (pellet) one month after planting, M4 = Sub-surface 1/2 at planting + 1 at flowering.

3. DESIGN:

(i) R.B.D. (ii) (a) 21. (b) 132' X 64.5'. (iii) 4. (iv) (a) 42.5' X 7.5'. (b) 40.83' X 5.83'. (v) 1 row around. (vi) Yes.

4. GENERAL:

Same as in exp. no. 55(19) on page 29.

5. RESULTS:

(i) 1946 lb./ac. (ii) 194.4 lb./ac. (iii) Main effects of M and S are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>Mean</th>
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<td>2339</td>
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<td>2069</td>
<td>2259</td>
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<td>1812</td>
<td>1949</td>
<td>1947</td>
<td>2020</td>
<td>2241</td>
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<tr>
<td>S4</td>
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<td>1813</td>
<td>1776</td>
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<td>2013</td>
</tr>
<tr>
<td>Mean</td>
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<td>1920</td>
<td>1892</td>
<td>2046</td>
<td>1968</td>
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</table>

S.E. of S marginal mean = 48.6 lb./ac.
S.E. of M marginal mean = 43.5 lb./ac.
S.E. of body of table or control mean = 97.2 lb./ac.

---

Crop: Paddy (Khariji).  
Site: Central Rice Res. Instt., Cuttack.  
Object: To study the response of Paddy to organic and inorganic manures.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A.  
(ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.
(iv) (a) 4 ploughings, ladening and levelling. (b) Transplanted. (c) N.A.  
(d) 10° X 10°. (e) 2 to 3. (v) Nil.  
(vi) T=1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding.  

2. TREATMENTS:

All combinations of (1) and (2)  
(1) 4 levels of N as compost: C0=0, C1=30, C2=60 and C3=90 lb./ac.  
(2) 3 levels of N as A/S: N0=0, N1=15 and N2=30 lb./ac.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A.  
(iii) 4. (iv) (a) 19°2′ X 30′. (b) 17°8′ X 28°4′. (v) 10° X 10°.  
(vi) Yes.

4. GENERAL:

(i) Good.  
(ii) N.A. (iii) Yield of grain and straw, height, tiller count and ear-length measurements. (iv) (a) 1951—contd.  
(b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1164 lb./ac.  
(ii) 727.0 lb./ac.  
(iii) Main effects of C and N are highly significant. (iv) Av. yield of grain in lb./ac.
Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.

Object: To study the effect of application of fertilizers to the nursery and different levels of N to the field on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A.  (ii) (a) Clay loam. (b) Refor soil analysis, C.R.R.I., Cuttack. (iii) 23.6.1958/5.8.1958.  (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10" x 10". (e) 2 to 3. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 57.94". (x) 11.12.1958.

2. TREATMENTS:
   Main-plot treatments:
   3 levels of N: N₀=0, N₁=26.7 and N₂=53.5 lb./ac.
   Sub-plot treatments:
   2 seed treatments: S₁=Seedlings unfertilized given compost at 25 lb./plot and S₂=Seedlings fertilized with 15 lb./plot of N + 10 lb./plot of P₂O₅ and K₂O each.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10" x 8" 2. (b) 28" x 6" 6. (v) 10" x 10". (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Height, tiller counts, grain and straw yield. (iv) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 3139 lb./ac. (ii) ca. 751.5 lb./ac. (b) 264.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th>N₂</th>
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</tr>
<tr>
<td>Mean</td>
<td>2550</td>
<td>3506</td>
<td>3360</td>
<td>3139</td>
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</table>

S.E. of difference of two
1. N marginal means = 375.8 lb./ac.
2. S marginal means = 116.1 lb./ac.
3. S means at the same level of N = 201.2 lb./ac.
4. N means at the same level of S = 401.7 lb./ac.
Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.

Object: To study the growth and uptake of nutrients by Paddy crop under field conditions under different manurial treatments.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 21.6.1958/18.7.1958. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 9.8" x 9.8". (e) 2 to 3. (v) Nil. (vi) T=1424 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 57.94". (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 4 levels of N as A/S: N_0 = 0, N_1 = 17.8, N_2 = 35.7 and N_3 = 53.5 lb./ac.
   (2) 2 levels of P_2O_5: P_0 = 0 and P_1 = 26.8 lb./ac.
   (3) 2 levels of K_2O : K_0 = 0 and K_1 = 26.8 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 2. (iv) (a) 32.8' x 23.0'. (b) 31.2' x 21.3'. (v) One row around the experimental unit. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height, tiller counts and ear-length. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2589 lb./ac. (ii) 189.0 lb./ac. (iii) N effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th>N_2</th>
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</table>

S.E. of N marginal mean
S.E. of P or K marginal mean
S.E. of body of N x P or N x K table
S.E. of body of P x K table

---

Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.

Object: To study the effect of N and its time of application on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (i) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 21.6.1958/30.7.1958. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 9.8" x 9.8". (e) 2 to 3. (v) Nil. (vi) P_2O_5 and K_2O each at 26.8 lb./ac. at puddling. (vii) T-141 (medium). (viii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 57.94". (x) 8 and 9.12.1958.

2. TREATMENTS:
   8 levels of N: T_0 = 0, T_1 = 17.8, T_2 = 35.7, T_3 = 53.5, T_4 = 71.4, T_5 = 89.2 lb./ac, T_6 = 17.8 lb./ac, as basal + 17.8 lb./ac as top dressing and T_7 = 35.7 lb./ac, as basal + 17.8 lb./ac as top dressing.

Treatments T_1 to T_3 applied as basal dressing. Top dressing done at boot stage.
3. **DESIGN:**
   (i) R.B.D.  
   (ii) (a) 8.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) $60.7' \times 8.2'$.  
   (b) $59.0' \times 7.4'$.  
   (v) One row alround.  
   (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory.  
   (ii) N.A.  
   (iii) Yield of grain and straw, height, tiller counts and ear-length measurements.  
   (iv) (a) 1958—1959.  
   (b) N.A.  
   (c) Nil.  
   (v) to (vii) Nil.

5. **RESULTS:**
   (i) 2511 lb./ac.  
   (ii) 103.5 lb./ac.  
   (iii) Treatment differences are significant.  
   (iv) Av. yield of grain in lb./ac.

| Treatment |  |  |  |  |  |  |  |
|-----------|---|---|---|---|---|---|
| Av. yield | 1848 | 2084 | 2637 | 2850 | 3031 | 2701 | 2485 | 2511 |

S.E./mean = 51.8 lb./ac.

---

_Crop _:- Paddy (Kharif).  
_Ref :- C.R.R.I. 59(22).  
_Site _:- Central Rice Res. Inst., Cuttack.  
_Type _:- 'M'.

Object :- To study the effect of N and its time of application on the yield of Paddy.

1. **BASAL CONDITIONS**:
   (i) (a) Nil.  
   (b) Fallow.  
   (c) Nil.  
   (ii) (a) Aluvial clay loam.  
   (b) Refer soil analysis, C.R.R.I., Cuttack.  
   (iv) (a) Summer ploughing and puddling just before planting.  
   (b) Transplanted.  
   (c) N.A.  
   (d) 9.8' x 9.8'.  
   (e) 2 to 3.  
   (v) Uniform basal application of 26.8 lb./ac. of each P$_2$O$_5$ and K$_2$O.  
   (vi) T-141.  
   (vii) Irrigated.  
   (viii) 3 intercultures.  
   (ix) N.A.  
   (x) 4.12.1959.

2. **TREATMENTS**:
   Same as in expt. no. 58(11) on page 34.

3. **DESIGN**:
   (i) R.B.D.  
   (ii) (a) 8.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) $59.0' \times 8.2'$.  
   (b) $57.4' \times 6.6'$.  
   (v) One row alround.  
   (vi) Yes.

4. **GENERAL**:
   (i) Good. Some lodging occurred.  
   (ii) N.A.  
   (iii) Flowering dates, tiller counts, grain and straw yield.  
   (iv) (a) 1958—1959.  
   (b) and (c) Nil.  
   (v) to (vii) Nil.

5. **RESULTS**:
   (i) 2387 lb./ac.  
   (ii) 174.0 lb./ac.  
   (iii) Treatment differences are highly significant.  
   (iv) Av. yield of grain in lb./ac.

| Treatment |  |  |  |  |  |  |  |
|-----------|---|---|---|---|---|---|
| Av. yield | 1178 | 1774 | 2283 | 2092 | 3208 | 2730 | 2507 | 2604 |

S.E./mean = 87.0 lb./ac.

---

_Crop _:- Paddy (Kharif).  
_Ref :- C.R.R.I. 58(13).  
_Site _:- Central Rice Res. Inst., Cuttack.  
_Type _:- 'M'.

Object :- To study the growth and uptake of nutrients by Paddy grown under irrigated, transplanted conditions with different manurial treatments.

1. **BASAL CONDITIONS**:
   (i) (a) Nil.  
   (b) Paddy.  
   (c) N.A.  
   (d) Nil.  
   (a) Clay loam.  
   (b) Refer soil analysis C.R.R.I., Cuttack.  
   (iv) (a) 4 ploughings, laddering, and levelling.  
   (b) Transplanted.  
   (c) N.A.  
   (d) 9.8' x 5.9'.  
   (e) 2 to 3.  
   (v) Nil.  
   (vi) PTB 10 (early).  
   (vii) Irrigated.  
   (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding.  
   (ix) 57.9'.  
   (x) 17.10.1959.
2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 levels of N: \( N_0 = 0 \), \( N_1 = 26.8 \), \( N_2 = 53.5 \) and \( N_3 = 80.3 \) lb./ac.
(2) 3 levels of \( P_0 \): \( P_0 = 0 \), \( P_1 = 44.6 \) and \( P_2 = 89.2 \) lb./ac.
Manures applied on 30.7.1959.

3. DESIGN:
(i) Factor in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 18.7' x 8.2' (b) 17.7' x 6.6'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height measurements and tiller counts. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1712 lb./ac. (ii) 383.6 lb./ac. (iii) N effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_0 )</td>
<td>1085</td>
<td>1093</td>
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<td>2362</td>
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<tr>
<td>( P_1 )</td>
<td>1255</td>
<td>1842</td>
<td>2193</td>
<td>2365</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>585</td>
<td>1834</td>
<td>1927</td>
<td>1677</td>
</tr>
</tbody>
</table>

Mean 1109 1790 2135 1712

S.E. of N marginal mean = 127.9 lb./ac.
S.E. of P marginal mean = 110.7 lb./ac.
SE of body of table = 221.5 lb./ac.

---

Crop = Paddy (Kharif).
Site = Central Rice Res. Inst., Cuttack.
Object = To study the response of Paddy to dhanicha and A/S.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 19.6.1954/26.7.1954. (iv) (a) 4 ploughings, ladinging and levelling. (b) Transplanted. (c) and (d) N.A. (e) 2 to 3. (f) Nil. (g) T = 90 (date). (h) Irrigated. (i) to (iii) 2 to 3 intercultures with Japanese weed and I hand weeding. (iv) 55.24'. (v) 13 and 14.12.1954.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 levels of N as A/S: \( N_0 = 0 \), \( N_1 = 10 \), \( N_2 = 20 \) and \( N_3 = 30 \) lb./ac.
(2) 4 levels of N as dhanicha: \( D_0 = 0 \), \( D_1 = 10 \), \( D_2 = 20 \) and \( D_3 = 30 \) lb./ac.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 14'2" x 20'10". (b) 11'8" x 18'4". (v) 1 row around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw, height, tiller counts and ear length measurements. (iv) (a) 1950-1954. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 3032 lb./ac. (ii) 185.3 lb./ac. (iii) Main effects of D and N are highly significant. (iv) Av. yield of grain in lb./ac.
Crop = Paddy.

Site = Central Rice Res. Instt., Cuttack.

Ref = C.R.R.I. 54(18).

Type := 'M'.

Object := To study the efficiency of mung grown as such with pillipeara and P for seed and as G.M. to Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 17.6.1954/18.7.1954. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 9" x 6", (e) 2 to 3. (v) Nil. (vi) FTB—10. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 55.24", (x) 12.10.1954.

2. TREATMENTS:

All combinations of (I) and (2)

(I) 4 treatments applied to the previous crop: T₀ = Fallow, T₁ = Mung as G.M., T₂ = Mung for seed and T₃ = Mung for seed + pillipeara.

(2) 3 levels of P₂O₅: P₀ = Control, P₁ = 30 lb./ac. of P₂O₅ applied to previous crop and P₂ = 30 lb./ac. of P₂O₅ applied to paddy crop.

3. DESIGN:

(i) Fact in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 14' x 13'. (b) 12' x 11.5'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height, tiller counts and ear-length measurements. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 2874 lb./ac. (ii) 192.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2730</td>
<td>2995</td>
<td>2844</td>
<td>2766</td>
<td>2834</td>
</tr>
<tr>
<td>2892</td>
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<tr>
<td>2872</td>
<td>2982</td>
<td>2825</td>
<td>289</td>
<td>2917</td>
</tr>
</tbody>
</table>

Mean: 2831 2975 2829 2859 2874

S.E. of T marginal mean = 55.6 lb./ac.

S.E. of P marginal mean = 48.2 lb./ac.

S.E. of body of table = 96.3 lb./ac.
Crop: Paddy (Kharij).
Site: Central Rice Res. Instt., Cuttack.

Object: To study the efficiency of mung grown as such and with pillipesara for seed and as G.M. to Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 13.6.1955; 23.7.1955. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted (c) N.A. (d) 5' x 6'. (e) 3 to 3. (v) Nil. (vi) PTB-10 (only). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 7.7.1955; (x) 11.10.1955.

2. TREATMENTS:
   Same as in expt. no. 54(18) on page 37.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 15' x 14'. (b) 11' x 13'. (v) 1 row around. (vi) Yes.

4. GENERAL:
   Same as in expt. no. 54(18) on page 37.

5. RESULTS:
   (i) 2382 lb./ac. (ii) 159.2 lb./ac. (iii) Main effect of T alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
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<tbody>
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<td>P₀</td>
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<td>2579</td>
<td>2257</td>
<td>2377</td>
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<td>P₂</td>
<td>2345</td>
<td>2487</td>
<td>2373</td>
<td>2473</td>
<td>2420</td>
</tr>
</tbody>
</table>

Mean 2323 2508 2315 2383 2382

S.E. of T marginal mean = 45.9 lb./ac.
S.E. of P marginal mean = 39.8 lb./ac.
S.E. of body of table = 79.6 lb./ac.

Crop: Paddy (Kharij).
Site: Central Rice Res. Instt., Cuttack.

Object: To study the efficiency of mung grown as such and with pillipesara for seed and as G.M. to Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 28.6.1956/1 and 2.8.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10' x 6'. (e) 2 to 3. (v) Nil. (vi) T=1145 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 8.2.1956; (x) 20.11.1956.

2. TREATMENTS:
   Same as in expt. no. 54(18) on page 37.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 22' x 20'. (b) 20' x 18'. (v) 1' x 10'. (vi) Yes.

4. GENERAL:
   Same as in expt. no. 54(18) on page 37.
5. RESULTS:

(i) 2217 lb./ac.  (ii) 391.2 lb./ac.  (iii) None of the effects is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2161</td>
<td>2464</td>
<td>2083</td>
<td>2353</td>
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</tr>
<tr>
<td>( P_1 )</td>
<td>2072</td>
<td>2315</td>
<td>2193</td>
<td>2334</td>
<td>2228</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>2163</td>
<td>2236</td>
<td>2064</td>
<td>2166</td>
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<td>Mean</td>
<td>2132</td>
<td>2338</td>
<td>2113</td>
<td>2284</td>
<td>2217</td>
</tr>
</tbody>
</table>

S.E. of T marginal mean = 113.5 lb./ac.
S.E. of P marginal mean = 98.3 lb./ac.
S.E. of body of table = 196.6 lb./ac.

---

Crop : Paddy (Khari).
Site : Central Rice Res. Inst., Cuttack.
Ref : C.R.R.I. 57(5).
Type : 'M'.

Object : To study the efficiency of mung grown as such and with pippilensara and P for seed and as G.M. to Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Paddy.  (c) N.A.  (ii) (a) Clay loam.  (b) Refer soil analysis, C.R.R.I., Cuttack.
   (iii) 28.6.1957/13.8.1957.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanted.  (c) N.A.
   (d) 10' \times 6'.  (e) 2 to 3.  (v) Nil.  (vi) T=1145 (medium).  (vii) Irrigated.  (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding.  (ix) 29.47'.  (x) 29.11.1957.

2. TREATMENTS:
   Same as in expt. no. 54(18) on page 37.

3. DESIGN:
   (i) Fact. in R.B.D.  (ii) (a) 12.  (b) N.A.  (iii) 4.  (iv) (a) 22' \times 20'.  (b) 20' \times 18'4'.  (v) 1' \times 10'.  (vi) Yes.

4. GENERAL:
   Same as in expt. no. 54(18) on page 37.

5. RESULTS:
   (i) 2921 lb./ac.  (ii) 116.5 lb./ac.  (iii) None of the effects is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_0 )</td>
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<td>2997</td>
<td>2803</td>
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<tr>
<td>Mean</td>
<td>2897</td>
<td>2974</td>
<td>2938</td>
<td>2876</td>
<td>2921</td>
</tr>
</tbody>
</table>

S.E. of T marginal mean = 33.6 lb./ac.
S.E. of P marginal mean = 29.1 lb./ac.
S.E. of body of table = 58.2 lb./ac.
Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.

Object: To find out the efficiency of different G.M. brought from outside on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 17.6.1955/21.7.1955. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10' x 10'. (e) 2 to 3. (v) Nil. (vi) T: 1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 72.75'. (x) 13.12.1955.

2. TREATMENTS:
   16 G.M. treatments:
   G0=Control (no G.M.), G1=Dhaincha, G2=Sesbania speciosa, G3=Sesbania, G4=Phaseolus Semirecrtus, G5=Cassia Li Sehensatiaka, G6=Wild Cassia, G7=Crotolaria Skista, G8=Crotolaria Unarmoeuis, G9=Crotolaria Brownei, G10=Tephrosia Canulida, G11=Tephrosia Purpurea, G12=Aescopnomena Americana, G13=Glyricidir Maculata, G14=Desmodium Gyroides, and G15=A/S at 20 lb/ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 15' X 11'8'. (b) 0.325.7 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw, height, tiller counts, and ear-length measurements. (iv) (a) 1955—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2562 lb/ac. (ii) 272.2 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb/ac.

   Treatment
   G0  G1  G2  G3  G4  G5  G6  G7  G8  G9  G10 G11 G12 G13 G14 G15
   Av. yield 2323 2362 2323 2544 2646 2787 2516 2738
   S.E./mean = 136.1 lb/ac.
Crop :- Paddy (Kharif).
Site : Central Rice Res. Instt., Cuttack.

Object :- To find out the efficiency of different G.M. brought from outside on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 26.6.1957/1.8.1957. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10\(^{\times}\)10\(^{\prime}\). (e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weed and 1 hand weeding. (ix) 29.47°. (x) 25.12.1957.

2. TREATMENTS:
   Same as in expt. no. 55(6) on page 40.

3. DESIGN:
   (i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 21\(^{\prime}\)4\(^{\prime}\)\(\times\)14\(^{\prime}\)2\(^{\prime}\). (b) 21\(^{\prime}\)8\(^{\prime}\)\(\times\)12\(^{\prime}\)6\(^{\prime}\). (v) 1 row alround. (vi) Yes.

4. GENERAL:
   Same as in expt. no. 55(6) on page 40.

5. RESULTS:
   (i) 2173 lb./ac. (ii) 219.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>G_9</th>
<th>G_1</th>
<th>G_2</th>
<th>G_3</th>
<th>G_4</th>
<th>G_5</th>
<th>G_6</th>
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<td>2076</td>
<td>2015</td>
<td>2208</td>
<td>2283</td>
<td>2322</td>
<td>2070</td>
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<table>
<thead>
<tr>
<th>Treatment</th>
<th>G_9</th>
<th>G_8</th>
<th>G_10</th>
<th>G_11</th>
<th>G_12</th>
<th>G_13</th>
<th>G_14</th>
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<tbody>
<tr>
<td>Av. yield</td>
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<td>2311</td>
<td>1917</td>
<td>2424</td>
<td>2112</td>
<td>2374</td>
<td>1932</td>
<td>2158</td>
</tr>
</tbody>
</table>

S.E./mean = 101.6 lb./ac.

Crop :- Paddy (Kharif).
Site : Central Rice Res. Instt., Cuttack.

Object :- To study different methods of application of A/S on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 11.6.1954/17.7.1954. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10\(^{\times}\)6\(^{\prime}\). (e) 2 to 3. (v) Nil. (vi) T-241 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weed and one hand weeding. (ix) 55.3°. (x) 29.11.1954.

2. TREATMENTS:
   5 methods of applications of A/S : M_9 = Control, M_1 = 20 lb./ac. of N as A/S applied before planting and puddled in, M_2 = M_1 + 10 lb./ac. of N as pellets 3 weeks after planting, M_3 = 20 lb./ac. of N as pellets 3 weeks after planting and M_5 = 20 lb./ac. of N broadcast 3 weeks after planting.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 15'x4.2'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Height, tiller counts and yield of grain. (iv) (a) 1953—contd. (i) Yes (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 3125 lb./ac. (ii) 348.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
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<tbody>
<tr>
<td>Av. yield</td>
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<td>3196</td>
<td>3190</td>
<td>3203</td>
<td>3150</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>142.2 lb./ac.</td>
<td></td>
<td></td>
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</tbody>
</table>

Crop :- Paddy (Kharij).
Ref :- C.R.R.I. 54(15).
Site :- Central Rice Res. Instt, Cuttack.
Type :- 'M'.

Object :- To compare the efficiency of dhaincha as G.M. buried on different dates.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (i) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (ii) 20.6.1953/3.8.1954. (iv) (a) 4 ploughings; harrowing and levelling. (b) Transplanted. (c) N.A. (d) 9"x10". (e) 2 to 3. (f) Nil. (vi) T-10 (medium). (vii) Frequent. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 55-25. (x) 9 and 10.12.1954.

2. TREATMENTS:
12 manurial treatments : T₀ = Control (no manure), T₁ = 20 lb./ac. of N as A/S, T₂ = 53 days old dhaincha buried on 18.6.1954, T₃ = 83 days old dhaincha buried on 18.6.1954, T₄ = 53 days old dhaincha buried on 8.7.1954, T₅ = 83 days old dhaincha buried on 8.7.1954, T₆ = 53 days old dhaincha buried on 28.7.1954, T₇ = 83 days old dhaincha buried on 28.7.1954, T₈ = 40 days old compost made on 18.6.1954 from 53 days old dhaincha buried on 28.7.1954, T₉ = 40 days old compost made on 18.6.1954, from 83 days old dhaincha buried on 28.7.1954, T₁₀ = 20 days old compost made on 28.7.1954, T₁₁ = 20 days old compost made on 8.7.1954, from 33 days old dhaincha buried on 28.7.1954, T₁₂ = 30 days old compost made on 8.7.1954.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 30'x30', (b) 28.6'x18'. (v) 1 row around. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain, straw, height, tiller counts and ear-length measurements. (iv) (a) 1953—contd. (b) N.A. (c) Nil. (d) Nil. (e) to (vii) Nil.

5. RESULTS:
(i) 3799 lb./ac. (ii) 240.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
<th>T₁₀</th>
<th>T₁₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>3106</td>
<td>3241</td>
<td>3365</td>
<td>3506</td>
<td>3333</td>
<td>3336</td>
<td>3188</td>
<td>3159</td>
<td>3373</td>
<td>3322</td>
<td>3164</td>
<td>120.0 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>
Object:— To study the effect of time and method of incorporating G.M. crop in the soil on the yield of subsequent Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Chay lemon. (b) Refer soil analysis. C.R.R.I., Cuttack. (iii) 17.6.1955/5.8.1955. (iv) (a) 4 ploughings, lodging and levelling. (b) Transplanted. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) T=141 (medium). (vii) Irrigated. (viii) 2 intercultures with Japanese weeder and one hand weeding. (ix) 72.71†. (x) 3 and 4.12.1955.

2. TREATMENTS:
   All combinations of (1) and (2) + 2 extra treatments
   (1) 2 ages of dhaincha at burying: A1=60 and A2=90 days.
   (2) 6 green manurial treatments: M1=Dhaincha buried on 1st June, M2=Dhaincha buried on 1st July, M3=Dhaincha buried on 15th July, M4=Dhaincha grown in situ and buried on 1st June, M5=Dhaincha composted and buried on 1st June and M6=Dhaincha composted and buried on 1st July.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 16"×10'. (b) 15'×28'. (v) 10"×1'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of grain, straw, height, tiller and ear-length measurements. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2640 lb./ac. (ii) 155.0 lb./ac. (iii) "T0 vs. T1" and "extra treatments vs. others" are significant. (v) Av. yield of grain in lb./ac.

\[
\begin{array}{ccccc}
&A_1&M_1&M_2&M_3&M_4&M_5&M_6&\text{Mean} \\
A_1&2669&2744&2877&2838&2645&2523&2716 \\
A_2&2775&2596&2571&2679&2586&2574&2530 \\
\text{Mean}&2722&2670&2724&2758&2615&2549&2673 \\
\end{array}
\]

S.E. of A marginal mean = 31.6 lb./ac.
S.E. of M marginal mean = 54.8 lb./ac.
S.E. of body of table or extra treatment mean = 77.5 lb./ac.
2. TREATMENTS:
All combinations of (1) and (2) + 2 extra treatments
(1) 2 ages of dhaincha at burying: A1 = 8 and A2 = 12 weeks.
(2) 7 green manured treatments: M1 = Dhaincha buried 8 weeks before planting, M2 = Dhaincha buried 4 weeks before planting, M3 = Dhaincha buried 2 weeks before planting, M4 = Dhaincha composted 8 weeks before planting, M5 = Dhaincha composted 4 weeks before planting and M6 = Dhaincha grown in situ and buried 2 weeks before planting.
Extra treatments: T0 = Control and T1 = 20 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 30' X 15'. (b) 28' X 13'. (v) 12' X 10'.
(vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw, height, tiller counts and ear-length measurements. (iv) (a) 1953—cond. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2094 lb./ac. (ii) 291.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac. T0 = 1913 lb./ac. and T1 = 1959 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>2062</td>
<td>2125</td>
<td>2188</td>
<td>2234</td>
<td>1919</td>
<td>1862</td>
<td>2132</td>
<td>2117</td>
</tr>
<tr>
<td>A2</td>
<td>2241</td>
<td>2210</td>
<td>20.0</td>
<td>2074</td>
<td>1975</td>
<td>1936</td>
<td>2257</td>
<td>2115</td>
</tr>
<tr>
<td>Mean</td>
<td>2152</td>
<td>2177</td>
<td>2139</td>
<td>2154</td>
<td>1947</td>
<td>1899</td>
<td>2344</td>
<td>2116</td>
</tr>
</tbody>
</table>

S.E. of A marginal mean = 55.1 lb./ac.
S.E. of M marginal mean = 103.2 lb./ac.
S.E. of body of table or Extra treatment mean = 145.9 lb./ac.

Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.
Type: 'M'.

Object: To study the effect of time and method of incorporation of G.M. in the soil on the yield of Paddy crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (i) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 28.6.1957/8.8.1957. (iv) (a) 4 ploughings, Jaddering and levelling. (b) Transplanted. (c) N.A. (d) 10" X 6".

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 56 (19) on page 43.

5. RESULTS:
(i) 3109 lb./ac. (ii) 262.1 lb./ac. (iii) M effect and 'control vs. others' are significant. (iv) Av. yield of grain in lb./ac. T0 = 2825 lb./ac. and T1 = 3181 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>2862</td>
<td>.10</td>
<td>3113</td>
<td>3349</td>
<td>2906</td>
<td>3018</td>
<td>3484</td>
<td>3106</td>
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<tr>
<td>A2</td>
<td>3313</td>
<td>189</td>
<td>2202</td>
<td>2977</td>
<td>3109</td>
<td>2887</td>
<td>3322</td>
<td>3143</td>
</tr>
<tr>
<td>Mean</td>
<td>3087</td>
<td>3100</td>
<td>3157</td>
<td>3163</td>
<td>3007</td>
<td>2952</td>
<td>3403</td>
<td>3124</td>
</tr>
</tbody>
</table>
Crop :- Paddy (Kharif).  
Site :- Central Rice Res. Instt., Cuttack.  
Ref :- C.R.R.I. 54(11).  
Type :- ‘M’.

Object :- To study the efficiency of dhaincha and sannhep grown within plot and brought from outside applied alone and in combinations with inorganic fertilizers.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (b) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 20.6.1954/29.7.1954. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10°5×9°. (e) 2 to 3. (v) Nil. (vi) T—141 (medium). (vii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 1953—contd. (x) Yes.

2. TREATMENTS:
All combinations of (1) (2), (3), (4), (5) and (6)
(1) 2 types of G.M. : A₀=Sannhep and A₁=Dhaincha.
(2) 2 methods of application : B₀= Brought from outside and B₁=Grown in situ.
(3) 2 levels of lime : C₀=0 and C₁=1 ton/ac.
(4) 2 levels of P₂O₅ at Super to G.M. : D₀=0 and D₁=50 lb./ac.
(5) 2 levels on N as A/S : F₀=0 and F₁=30 lb./ac.
(6) 2 levels of P₂O₅ to paddy : F₀=0 and F₁=50 lb./ac.

3. DESIGN:
(i) 2⁶ confd. (ii) (a) 16 plots/block : 4 blocks/replication. (b) N.A. (iii) 1953—contd. (iv) (a) 30'x15'. (b) 28.33'x13.5'. (v) 1 row allround. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Straw and grain yields, height, tiller and ear-length measurements. (iv) (a) 1953—contd. (b) Yes. (c) Nil. (v) to (vi) Nil.

5. RESULTS:
(i) 373 lb./ac. (ii) 245.0 lb./ac. (iii) N.rce of the effects is significant. (iv) Mean and differential response table of grain in lb./ac.

<table>
<thead>
<tr>
<th>Differential response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean response</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>A₀</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>E</td>
</tr>
<tr>
<td>F</td>
</tr>
</tbody>
</table>

S.E. of mean response = 61.2 lb./ac.  
S.E. of differential response = 43.3 lb./ac.
Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.

Ref: C.R.R.I. 54(11).
Type: 'M'.

Object: To study the efficiency of dhaincha and samshemp grown in situ and brought from outside applied alone and in combinations with inorganic fertilizers.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 20.L,1955/7 6 - 1955. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10" x 6". (e) 2 to 3. (v) Nil. (vi) T—141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 72.71". (x) 28 to 31.11.1955.

2. TREATMENTS to 4. GENERAL:
Same as in exp't no. 54(11) on page 45.

5. RESULTS:
(i) 2428 lb./ac. (ii) 212.0 lb./ac. (iii) Main effects of B, D and E are significant. Interaction A x C is significant. (iv) Mean and differential responses table of grain in lb./ac.

<table>
<thead>
<tr>
<th>Mean response</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A_&lt;sub&gt;0&lt;/sub&gt;, A_&lt;sub&gt;1&lt;/sub&gt;</td>
<td>B_&lt;sub&gt;0&lt;/sub&gt;, B_&lt;sub&gt;1&lt;/sub&gt;</td>
<td>C_&lt;sub&gt;0&lt;/sub&gt;, C_&lt;sub&gt;1&lt;/sub&gt;</td>
<td>D_&lt;sub&gt;0&lt;/sub&gt;, D_&lt;sub&gt;1&lt;/sub&gt;</td>
<td>E_&lt;sub&gt;0&lt;/sub&gt;, E_&lt;sub&gt;1&lt;/sub&gt;</td>
<td>F_&lt;sub&gt;0&lt;/sub&gt;, F_&lt;sub&gt;1&lt;/sub&gt;</td>
</tr>
<tr>
<td>A</td>
<td>—16.8</td>
<td>—</td>
<td>—28.3</td>
<td>—363.8</td>
<td>103.2</td>
<td>38.1</td>
</tr>
<tr>
<td>B</td>
<td>—262.8</td>
<td>—217.6</td>
<td>—307.9</td>
<td>—213.3</td>
<td>—309.7</td>
<td>—263.3</td>
</tr>
<tr>
<td>C</td>
<td>26.6</td>
<td>—93.4</td>
<td>146.6</td>
<td>73.6</td>
<td>—20.3</td>
<td>—</td>
</tr>
<tr>
<td>D</td>
<td>—60.2</td>
<td>—5.4</td>
<td>—115.1</td>
<td>—60.8</td>
<td>—59.7</td>
<td>—3.8</td>
</tr>
<tr>
<td>E</td>
<td>—554.0</td>
<td>—498.8</td>
<td>—607.2</td>
<td>—606.2</td>
<td>—491.8</td>
<td>—541.6</td>
</tr>
<tr>
<td>F</td>
<td>117.8</td>
<td>89.5</td>
<td>146.0</td>
<td>193.4</td>
<td>42.1</td>
<td>139.3</td>
</tr>
</tbody>
</table>

S.E. of mean response = 53.0 lb./ac. S.E. of differential response = 37.5 lb./ac.

Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.

Ref: C.R.R.I. 56(7).
Type: 'M'.

Object: To study the efficiency of dhaincha and samshemp grown in situ and brought from outside, applied alone and in combinations with inorganic fertilizers.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 22.6.1956/21.7.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10" x 6". (e) 2 to 3. (v) Nil. (vi) T—141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 82.71". (x) 8.12.1956.

2. TREATMENTS to 4. GENERAL:
Same as in exp't no. 54(11) on page 45.

5. RESULTS:
(i) 2790 lb./ac. (ii) 313.3 lb./ac. (iii) Interactions A x F and D x E are significant. (iv) Mean and differential responses table of grain in lb./ac.
Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A₀</td>
<td>A₁</td>
<td>B₀</td>
<td>B₁</td>
<td>C₀</td>
<td>C₁</td>
</tr>
<tr>
<td>A</td>
<td>33.6</td>
<td></td>
<td>−59.4</td>
<td>126.6</td>
<td>−48.8</td>
<td>115.9</td>
</tr>
<tr>
<td>B</td>
<td>31.3</td>
<td></td>
<td>−59.8</td>
<td>126.3</td>
<td>−67.8</td>
<td>−1.2</td>
</tr>
<tr>
<td>C</td>
<td>126.8</td>
<td></td>
<td>41.5</td>
<td>209.2</td>
<td>161.3</td>
<td>92.4</td>
</tr>
<tr>
<td>D</td>
<td>142.8</td>
<td></td>
<td>59.4</td>
<td>216.2</td>
<td>246.2</td>
<td>39.4</td>
</tr>
<tr>
<td>E</td>
<td>−101.6</td>
<td></td>
<td>−57.0</td>
<td>−146.2</td>
<td>−55.6</td>
<td>−147.6</td>
</tr>
<tr>
<td>F</td>
<td>3.8</td>
<td></td>
<td>−59.1</td>
<td>+66.7</td>
<td>44.3</td>
<td>−36.8</td>
</tr>
</tbody>
</table>

S.E. of mean response = 78.3 lb./ac.  S.E. of differential response = 55.4 lb./ac.

Crop: Paddy (Kharij).
Site: Central Rice Res. Inst., Cuttack.
Ref.: C.R.R.I. 57(6).
Type: M⁻¹.

Object: To study the efficiency of dhaincha and samshemp, grown in situ and brought from outside applied alone and in combinations with inorganic fertilizers.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 21.6.1957/6.8.1957. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10"×6". (e) 2 to 3. (v) Nil. (vi) T−141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.4.7. (x) 12.12.1957.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 54(11) on page 45.

5. RESULTS:
(i) 2800 lb./ac. (ii) 403.8 lb./ac. (iii) Main effect of E is significant. (iv) Mean and differential response of grain in lb./ac.

<table>
<thead>
<tr>
<th>Mean response</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A₀</td>
<td>A₁</td>
<td>B₀</td>
<td>B₁</td>
<td>C₀</td>
<td>C₁</td>
</tr>
<tr>
<td>A</td>
<td>145.1</td>
<td></td>
<td>122.8</td>
<td>147.5</td>
<td>9.4</td>
<td>280.8</td>
</tr>
<tr>
<td>B</td>
<td>113.8</td>
<td></td>
<td>111.4</td>
<td>116.1</td>
<td></td>
<td>148.8</td>
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<tr>
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<td></td>
<td>−135.2</td>
<td>136.1</td>
<td>35.5</td>
<td>−34.6</td>
</tr>
<tr>
<td>D</td>
<td>−41.9</td>
<td></td>
<td>−150.6</td>
<td>64.8</td>
<td>−28.6</td>
<td>38.9</td>
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<tr>
<td>E</td>
<td>347.1</td>
<td></td>
<td>414.5</td>
<td>239.7</td>
<td>357.4</td>
<td>336.9</td>
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<tr>
<td>F</td>
<td>−20.2</td>
<td></td>
<td>−21.5</td>
<td>−37.0</td>
<td>−21.6</td>
<td>−36.9</td>
</tr>
</tbody>
</table>

S.E. of mean response = 100.9 lb./ac.  S.E. of differential response = 70.8 lb./ac.
Crop: Paddy (Kharif).
Ref: C.R.R.I. 54(12).
Site: Central Rice Res. Inst., Cuttack.
Type: "M'.

Object: To find out the effect of various O.M. crops grown in situ on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 11.6.1954/27.7.1954. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10"×9". (e) 2 to 3. (v) Nil. (vi) T−141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 5.2×7'. (x) 24 and 25.11.1954.

2. TREATMENTS:
   15 manurial treatments: T0=Control, T1=Dhaincha, T2=Sesbania speciosa, T3=Sunehemp, T4=P. semirectus, T5=P. leasr::hen. auritiana, T6=P. semi-rectus, T7=P. leasr::hen. auritiana, T8=Wild cassia, T9=Mung type 1, T10=S. Grandiflora, T11=T. candida, T12=Jowar, T13=Compost and T14=20 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 22.5'×192". (v) 1 row around. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height, tiller and ear-length measurements. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1901 lb./ac. (ii) 320.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>3555</td>
<td>4191</td>
<td>4049</td>
<td>3659</td>
<td>3986</td>
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<tr>
<td>Treatment</td>
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<td>T2</td>
<td>T10</td>
<td>T11</td>
<td>T12</td>
<td>T13</td>
<td>T14</td>
</tr>
<tr>
<td>Av. yield</td>
<td>3969</td>
<td>3877</td>
<td>3905</td>
<td>3741</td>
<td>3890</td>
<td>4169</td>
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</tbody>
</table>

S.E./mean = 160.3 lb./ac.

Crop: Paddy (Kharif).
Ref: C.R.R.I. 55(7).
Site: Central Rice Res. Inst., Cuttack.
Type: "M'.

Object: To find out the effect of various O.M. crops grown in situ on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 22.6.1955. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10"×9". (e) 2 to 3. (f) Nil. (g) T−141 (medium). (h) Irrigated. (i) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (j) 7×7'. (k) 10.12.1955.

2. TREATMENTS:
   16 manurial treatments: T0=Control, T1=Dhaincha, T2=Sesbania speciosa, T3=Sunehemp, T4=C. leasr::hen. auritiana, T5=P. semirectus, T6=P. leasr::hen. auritiana, T7=P. semirectus, T8=Wild cassia, T9=Mung type 2, T10=S. Grandiflora, T11=T. candida, T12=Jowar, T13=Compost and T14=20 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 5. (iv) (a) 30'×13'. (b) 25'×13'4". (v) 1'×10". (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height, tillers and ear-length measurements. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 2796 lb./ac. (ii) 134.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in
lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
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<tr>
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<tr>
<td>S.E./mean</td>
<td>67.3 lb./ac.</td>
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<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
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Crop : Paddy (Kharif).  
Site : Central Rice Res. Instt., Cuttack.  
Type : 'M'.

Ref : C.R.R.I. 56(5).

Object : To find out the relative efficiency of various G.M. crops grown in situ in comparison with compost and A/S for Paddy crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 5.7.1956/9 and 10.8.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10' x 6'. (e) 2 to 3. (v) Nil. (vi) T—141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 83.7%. (x) 13 and 14.12.1956.

2. TREATMENTS:
16 manurial treatments: T_1 = Dhaincha, T_2 = Sesbania speciosa, T_3 = Samshemp, T_4 = P. semirectus, T_5 = C. lechenaueri, T_6 = Mung (local), T_7 = Aeschynomene americana, T_8 = Crotolaria, T_9 = Wild cassia, T_10 = Tephrosia candida, T_11 = Cowpea (local), T_12 = Crotilaria usumons, T_13 = Jute, T_14 = Compost and T_15 = 20 lb./ac. of N as A/S.

3. DESIGN and 4. GENERAL:
Same as in exp. no 55(7) on page 48.

5. RESULTS:
(i) 2936 lb./ac. (ii) 176.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in
lb./ac.

<table>
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<th>Treatment</th>
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<td>3073</td>
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<tr>
<td>S.E./mean</td>
<td>88.1 lb./ac.</td>
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Crop : Paddy (Kharif).  
Site : Central Rice Res. Instt., Cuttack.  
Type : 'M'.

Ref : C.R.R.I. 57(10).

Object : To find out the effect of various G.M. crops grown in situ on the yield of Paddy.
2. TREATMENTS:

16 manurial treatments: T₀ = Control, T₁ = Dhaincha, T₂ = Sesbania speciosa, T₃ = Sant hemp, T₄ = P. Semirenectus, T₅ = C. lechenouriana, T₆ = Mung, T₇ = Aeschynomene americana, T₈ = Crotonalora striata, T₉ = Wild cassia, T₁₀ = P. Pippicaria, T₁₁ = Cowpea, T₁₂ = Crotonalora umermoensis, T₁₃ = Sesamum, T₁₄ = Compost and T₁₅ = 20 lb./ac. of N as A/S.

3. DESIGN and 4. GENERAL:

Same as in exp. no. 55(7) on page 48.

5. RESULTS:

(i) 2268 lb./ac. (ii) 259.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
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<th>Treatment</th>
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<th>T₂</th>
<th>T₃</th>
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<td>Av. yield</td>
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<td>2398</td>
<td>2281</td>
<td>2418</td>
<td>1964</td>
<td>1963</td>
<td>2264</td>
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S.E./mean = 130.0 lb./ac.

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Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.
Ref: C.R.R.I. 54(1).
Type: 'M'.

Object: To study the effect of continuous application of A/S with and without compost on the yield of Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 23.6.1954/6.8.1954. (iv) (a) 4 ploughings, 1 laddering and levelling. (b) Transplanted. (c) N.A. (d) 10" X 6". (e) 2 to 3. (v) Nil. (vi) T=1145 (medium). (vii) Irrigated. (viii) 3 weedings (ix) 55.24' (x) 20 and 23.11.1954.

2. TREATMENTS:

Main-plot treatments:
- 2 levels of compost: C₀ = 0 and C₁ = 100 mds./ac.
Sub-plot treatments:
- 5 levels of N as A/S: N₀ = 0, N₁ = 20, N₂ = 40, N₃ = 60 and N₄ = 80 lb./ac.
Fertilizer applied on 24.8.1954.

3. DESIGN:

(i) Split-plot. (ii) 2 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 60' X 10.8'. (b) 58' X 9.2'. (v) 1 row around. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height, tillers and ear-length measurements. (iv) (a) 1949—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 2755 lb./ac. (ii) (a) 198.6 lb./ac. (b) 134.7 lb./ac. (iii) Main effect of C is significant. Main effect of N and interaction N X C are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
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</table>
Crop: Paddy (Kharif).

Site: Central Rice Res. Instt., Cuttack.

Object: To study the effect of continuous application of A/S with and without compost on the yield of Paddy.

Ref: C.R.R.I. 56(1).

Type: 'M'.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 10.6.1955/1.8.1955. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10'x6'. (e) 2 to 3. (v) Nil. (vi) T—1145 (medium). (vii) Irrigated. (viii) 2 to 3 weedicings with Japanese weeder and hand weeder. (a) 72.71'. (x) 23 and 24.11.1955.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(1) on page 50. Fertilizer applied on 17.8.1955.

4. GENERAL:
   (i) Satisfactory. Lodging on 11.10.1955 and 31.10.1955. (ii) N.A. (iii) Yield of grain and straw, height, tillers and ear-length measurements. (iv) (a) 1949—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1948 lb./ac. (ii) (a) 120.2 lb./ac. (b) 73.0 lb./ac. (iii) C effect is significant. Main effects of N and interaction NxC are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
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<th>N1</th>
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<tr>
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<td>1943</td>
<td>1647</td>
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</table>

S.E. of difference of two

|   | C marginal means | = 38.0 lb./ac. |
|   | N marginal means | = 36.6 lb./ac. |
|   | N means at the same level of C | = 51.6 lb./ac. |
|   | C means at the same level of N | = 59.8 lb./ac. |
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil.  
   (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.  
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A.  
   (d) 10"x6". (e) 2 to 3. (v) Nil.  
   (vi) T-1145 (medium). (vii) Irrigated.  
   (viii) 2 to 3 weedings with Japanese weeder.  
   (ix) 82.73".  

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 54(1) on page 30.  
   Fertilizers applied on 22.8.1956.  

4. GENERAL:
   (i) Satisfactory. Lodging on 1.11.1956. (ii) Nil. (iii) Yield of grain and straw, height, tiller counts and ear-length measurements. (iv) (a) 1949—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.  

5. RESULTS:
   (i) 2420 lb./ac.  
   (ii) 213.0 lb./ac. (b) 154.2 lb./ac.  
   (iii) Main effect of C is significant. Main effect of N and interaction CxN are highly significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
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S.E. of difference of two
1. C marginal means = 67.0 lb./ac.  
2. N marginal means = 77.0 lb./ac.  
3. N means at the same level of C = 109.0 lb./ac.  
4. C means at the same level of N = 118.9 lb./ac.  

Object:—To study the comparative efficiency of Urea and A/S as fertilizer for low land Paddy.
Object: To study the effect of fertilizers on different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Ref. to soil analysis, C.R.R.I., Cuttack. (iii) 19.6.1956/13.8.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9' x 9'.
   (e) 2 to 3. (f) Nil. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 62.73'. (x) 3.1.1957.

2. TREATMENTS:
   Main-plot treatments: 2 levels of manures: M₀ = No manure (control) and M₁ = 30 lb./ac. of P₂O₅ as Super+20 lb./ac. of N as A/S as basal dressing+20 lb./ac. of N as A/S as top dressing.


3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 30 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12' x 10'. (b) 10'6' x 8'6'. (v) 9' x 9'. (vii) Yes.

4. GENERAL:
   (i) Good (ii) N.A. (iii) Yield of grain and straw, height, tiller and ear-length measurements. (iv) (a) 1956—cond. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1596 lb./ac. (ii) 886.3 lb./ac. (b) 288.7 lb./ac. (iii) Only V effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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Cond. on page 54.
Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.
Type: ’MV’.

Object: To study the effect of fertilizers on different varieties of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 29.6.1957/26 and 27.8.1957. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10" x 10". (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 intercultures and 1 hand weeding. (ix) 24.07.57. (x) N.A.

2. TREATMENTS:
Main-plot treatments:
4 manurial treatments: M₀=Control, M₁=10 lb./ac. of N as G.L. + 20 lb./ac. of N as A/S, M₂=20 lb./ac. of N as G.L. + 40 lb./ac. of N as A/S and M₃=30 lb./ac. of N as G.L. + 60 lb./ac. of N as A/S.

Sub-plot treatments:

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication ; 24 sub-plots/main-plot. (b) Yes. (c) 13.4° x 7.6°. (d) 10° x 10°. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height, tiller counts and ear-length measurements. (iv) (a) 15°—contd. (b) No. (c) Nil. (v to (vii) Nil.

5. RESULTS:
(i) 2387 lb./ac. (ii) (a) 722.5 lb./ac. (b) 277.5 lb./ac. (iii) M effect is significant. V effect and M x V interaction are highly significant. (iv) Av. yield of grain in lb./ac.
55

<table>
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</table>

Mean 2360 2761 2751 2989 2568 1908 2666 2022 1770 1852 2190

Mean 2144 1432 2452 2552 3021 2012 2683 2573 2169 1925 2663 2285

S E. of difference of two
1. M marginal means = 120.4 lb./ac.
2. V marginal means = 113.2 lb./ac.
3. V means at the same level of M = 226.6 lb./ac.
4. M means at the same level of V = 232.4 lb./ac.

Crop : Paddy (Kharif).

Site: Central Rice Res. Inst., Cuttack.

Type : 'MV'.

Object: To study the effect of N on the yield of different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A. T.R.1959.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 10'x10'. (e) 2 to 3. (f) Nil. (g) As per treatments. (h) Irrigated. (i) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (j) 57.94'. (k) 28.12.1959.

2. TREATMENTS:
   Main-plot treatments:
   6 levels of N : M0 = Control, M1 = 30 lb./ac. N as basal dressing, M2 = M1 +30 lb./ac. of N as top dressing, M3 = 60 lb./ac. of N as basal dressing, M4 = M3 +30 lb./ac. of N as top dressing and M5 = 90 lb./ac. of N as basal dressing.

Sub-plot treatments:

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/replication; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) and (b) 18'x6.5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height and tiller measurements. (iv) (a) 1958-1959. (b) No. (c) Nil. (d) (i) to (vii) Nil.

5. RESULTS:
   (i) 1809 lb./ac. (a) 203.9 lb./ac. (b) 190.3 lb./ac. (iii) Main effect of V is highly significant. Main effect of N and N x V interaction are significant. (iv) Av. yield of grain in lb./ac.
Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.
Ref: C.R.R.I. 59(18).
Type: 'MV'.

Object: To study the effect of N on the yield of different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 23.6.1959/7.8.1959. (iv) (a) Summer ploughings followed by puddings. (b) Transplanting. (c) N.A. (d) 10" x 10". (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 intercultures. (ix) N.A., (x) 28 to 30.12.1959.

2. TREATMENTS:
   Main-plot treatments:
   6 levels of N: M0=Control, M1=26.8 lb./ac. of N as basal dressing, M2=M1+26.8 lb./ac. of N as top dressing, M3=M2+53.5 lb./ac. of N as basal dressing, M4=M3+26.8 lb./ac. of N as top dressing and M5=80.3 lb./ac. of N as basal dressing.
   Sub-plot treatments:
   8 late duration varieties: V1=AC—1951, V2=T—1242, V3=T—90, V4=BAM—9, V5=BAM—6, V6=Salak, V7=Untung and V8=W—24.

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/replication; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 8.2' x 19.7'. (b) 6.6' x 18.0'. (v) One row around. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1828 lb./ac. (ii) (a) 281.0 lb./ac. (b) 1900 lb./ac. (iii) Main effects of M and V are highly significant. Interaction M x V is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
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S.E. of difference of two
1. M marginal means = 99.3 lb./ac.
2. V marginal means = 77.6 lb./ac.
3. V means at the same level of M = 190.2 lb./ac.
4. M means at the same level of V = 2018 lb./ac.
Crop: Paddy (Kharif).

Site: Central Rice Res. Instt., Cuttack.

Object: To study the effect of N on different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) Fallow—Paddy. (b) Fallow. (c) Nil. (d) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (c) Transplanting. (d) 25 lb./ac. (e) 9' x 6'. (f) 2 to 3. (g) Nil. (h) As per treatments. (i) Irrigated. (j) Interculture and weeding. (k) 45.30°. (l) 17.12.1959.

2. TREATMENTS:
   Main-plot treatments:
   3 levels of N: N0=0, N1=30 and N2=60 lb./ac.

   Sub-plot treatments:
   8 late duration varieties: V1=T-1242, V2=T-90, V3=SR-26 B, V4=BAM—6, V5=EC—2705, V6=AC—2589 and V7=AC—2732.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 20'x15', (b) 18'x13.6'. (v) 1'x9'. (vi) Yes.

4. GENERAL:
   (i) Poor. (ii) Leaf roller, blast and helminthosporium towards the end of September, spraying with Folidol and other fungicides. (iii) Height and tiller measurements and yield of grain. (iv) (a) 1950—1960. (b) No. (c) Nil. (d) Nil. (e) Nil. (f) Nil. (g) Nil. (h) Nil. (i) Nil. (j) Nil. (k) Low rainfall in September resulted in heavy weed growth and high rainfall in October was responsible for high sterility. (l) Nil.

5. RESULTS:
   (i) 1574 lb./ac. (ii) (a) 753.0 lb./ac. (b) 279.0 lb./ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
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S.E. of difference of two
1. N marginal means = 217.4 lb./ac.
2. V marginal means = 131.5 lb./ac.
3. V means at the same level of N = 227.8 lb./ac.
4. N means at the same level of V = 304.4 lb./ac.
1. BASAL CONDITIONS:

(i) (a) Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Light clay loam. (b) Refet soil analysis, C.R.R.I., Cuttack. (iii) 30.6.1959/29.7.1959. (iv) (a) Ploughing by tractor, 2 puddlings and ladderings. (b) Transplanting. (c) 25 lb./ac. (d) 9"x6". (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Interculture and weeding. (ix) 49.4". (x) 13.11.1959 to 12.12.1959.

2. TREATMENTS:

Main-plot treatments:

5 levels of N: N₀ = 0, N₁ = 20, N₂ = 40, N₃ = 60 and N₄ = 80 lb./ac.

Sub-plot treatments:


3. DESIGN:

(i) Split-plot. (ii) (a) 5 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 10'x24'. (b) 8.5'x22'. (v) 9"x1'. (vi) Yes.

4. GENERAL:

(i) Fairly good. (ii) Mild attack of pests and blast. Spraying with Foliodol and Coppexa. (iii) Yield of grain, height and tiller counts. (iv) (a) 1958—H₀. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Low rainfall in September and high rainfall in October. (vii) Suffered to some extent due to untimely rainfall.

5. RESULTS:

(i) 2087 lb./ac. (ii) (a) 193.0 lb./ac. (b) 329.0 lb./ac. (iii) Main effects of N and V are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
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S.E. of difference of two

1. N marginal means = 70.5 lb./ac.
2. V marginal means = 109.7 lb./ac.
3. V means at the same level of N = 206.6 lb./ac.
4. N means at the same level of V = 213.5 lb./ac.

Ref: C.R.R.I. 59(15).
Type = "MV".

Object:—To study the effect of different levels of N and P on different varieties of Paddy.
Sub-plot treatments:
6 medium duration varieties: $V_1 = T-141$, $V_2 = BK-6$, $V_3 = T-1233$, $V_4 = T-874$, $V_5 = T-588$ and $V_6 = BR-6$.

3. DESIGN:
(i) Split-plot. (ii) (a) 8 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 17.9' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Tiller counts, height of the plants and yield of grain. (iv) (a) 1958-1960. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) No. (vii) Low rainfall in September and high rainfall in October. (viii) Low yield due to untimely rainfall.

5. RESULTS:
(i) 1978 lb./ac. (ii) (a) 355.0 lb./ac. (b) 231.0 lb./ac. (iii) Main effects of N and P are highly significant. Interaction N X P X V is highly significant. Interaction N X V and V X P are significant. (iv) Average yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>$V_4$</th>
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S.E. of difference of two
1. N marginal mean. $= 112.3$ lb./ac. 5. N means at the same level of $P = 184.2$ lb./ac.
2. P marginal means $= 79.4$ lb./ac. 6. V means at the same level of $P = 155.5$ lb./ac.
3. V marginal means $= 81.7$ lb./ac. 7. P means at the same level of V $= 130.2$ lb./ac.
4. V means at the same level of $N = 163.3$ lb./ac. S.E. of bc of N X P table $= 112.5$ lb./ac.

Crop -> Paddy (Kharif).
Ref -> C.R.R.I. 54(10).
Type -> IC.

Object -> To study the effect of growing different crops in the previous season on the yield of succeeding Paddy crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I. Cuttack. (iii) 17.6.1954/13.7.1954. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) PTF-10 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 35.2'. (x) 13.10.1954.

2. TREATMENTS:
12 previous crops: $C_1$ = Fallow, $C_2$ = Paddy, $C_3$ = Dhaincha for G.M., $C_4$ = Wheat, $C_5$ = Cotton, $C_6$ = Groundnut, $C_7$ = Linseed, $C_8$ = Mustard, $C_9$ = Gram, $C_{10}$ = Mung + Papathra.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 30' x 20'. (b) 28' x 18.5'. (v) 1' x 9'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, tiller counts and ear-length measurements. (iv) (a) 1551—contd. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 3305 lb./ac. (ii) 1213 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment  
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S.E./mean = 70.0 lb./ac.

Crop -> Paddy (Kharif).
Site -> Central Rice Res. Instt., Cuttack.
Ref -> C.R.R.I. 55(15).
Type -> 'C'.

Object:— To study the effect of growing different crops in the previous season on the yield of succeeding Paddy crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 11.6.1955/20.7.1955. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9"x6", (e) 2 to 3. (v) Nil. (vi) PTB—10 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 2 hand weedings. (ix) 72 71°. (x) 12 and 13.10.1955.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 54(10) on page 59.

5. RESULTS:
(i) 2347 lb./ac. (ii) 117.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment  
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<th>C₂</th>
<th>C₃</th>
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</table>

S.E./mean = 68.0 lb./ac.

Crop -> Paddy (Kharif).
Site -> Central Rice Res. Instt., Cuttack.
Ref -> C.R.R.I. 56(9).
Type -> 'C'.

Object:— To study the effect of growing different crops in the previous season on the yield of succeeding Paddy crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 12.6.1956/20.7.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9"x6", (e) 2 to 3. (v) Nil. (vi) PTB—10 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 82.73°. (x) 12 and 15.10.1956.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 54(10) on page 59.

5. RESULTS:
(i) 1905 lb./ac. (ii) 171.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment  
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S.E./mean = 99.0 lb./ac.
Crop: Paddy (Kharij).

Site: Central Rice Res. Instt., Cuttack.

Ref: C.R.R.I. 57(4).

Type: 'C'.

Object: To study the effect of growing different crops in the previous season on the yield of succeeding Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 9"x6'. (e) 2 to 3. (v) Nil. (vi) T—141 (medium) and PTB—10 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weed and 1 hand weeding. (ixe) 29.47". (x) N.A.

2. TREATMENTS:
   9 previous crops: C0=Fallow, C1=Paddy, C2=Gnm,paddy, C3=Gram, C4=Groundnut, C5=Cotton, C6=Wheat, C7=Gram, C8=Linnen, and C9=Bersetm.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 30'x20'. (b) 28'x18.5'. (c) 1'x9". (v) 1. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height, tilled and ear-length measurements. (iv) 1951—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) The exp. was modified in 1957.

5. RESULTS:
   (i) 261.2 lb./ac. (ii) 261.5 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

   Treatment C0 C1 C2 C3 C4 C5 C6 C7 C8
   Av. yield 2866 2846 2623 2605 2569 2265 2568 2687 2656

   S.E./mean = 122.8 lb./ac.

Crop: Paddy (Kharij).

Site: Central Rice Res. Instt., Cuttack.

Ref: C.R.R.I. 58(4).

Type: 'C'.

Object: To study the effect of growing different crops in the previous season on the yield of succeeding Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 24.6.1958/6.8.1958. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 9"x6'. (e) 2 to 3. (v) Nil. (vi) T—141 (medium) and PTB—10 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weed and 1 hand weeding. (ix) 57.94". (x) 24.10.1958 (PTB—10) and 8.12.1958 (T—141).

2. TREATMENTS:
   Same as in exp. no. 57(4) above.

3. DESIGN:
   (i) R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) 30'x20'. (b) 1/82.97 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   Same as in exp. no. 57(4) above.

5. RESULTS:
   (i) 245.9 lb./ac. (ii) 245.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment C0 C1 C2 C3 C4 C5 C6 C7 C8
   Av. yield 2588 2093 1790 1762 1775 1377 2004 1561 1618

   S.E./mean = 122.8 lb./ac.
Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.

Object:—To study the effect of different crops on the yield of succeeding Paddy crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 25.6.1959/1.8.1959. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) 25 lb./ac. (d) 9' x 6'. (e) 2 to 3. (v) Nil. (vi) PBD—10. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) N.A. (x) 9 and 10.11.1959.

2. TREATMENTS: same as in exp. no. 57(4) on page 61.

3. RESULTS:
(i) 1404 lb./ac. (ii) 401 lb./ac. (iii) Treatment differences are not significant. (iv) Ave. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C_s</th>
<th>C_1</th>
<th>C_2</th>
<th>C_3</th>
<th>C_4</th>
<th>C_5</th>
<th>C_6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>166</td>
<td>1359</td>
<td>1475</td>
<td>1804</td>
<td>1779</td>
<td>1453</td>
<td>1781</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>200.5 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.

Object:—To determine the effect of lodging on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10' x 6'. (e) 2. (f) Nil. (v) 7—1242 (late). (vi) Irrigated. (vii) 3 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 5534'. (x) N.A.

2. TREATMENTS: 6 dates of lodging the crop artificially: S_o = No artificial lodging, S_1 = 15.10.1954 (pre-flowering), S_2 = 25.10.1954 (pre-flowering), S_3 = 4.11.1954 (flowering), S_4 = 14.11.1954 (post-flowering) and S_5 = 24.11.1954 (post-flowering).

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 40' x 4'. (b) 392' x 3' x 10'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—cond. (b) No. (c) N.A. (vi) to (vii) N.A.

5. RESULTS:
(i) 2087 lb./ac. (ii) 196.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Ave. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S_0</th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
<th>S_5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>3164</td>
<td>1274</td>
<td>1268</td>
<td>1599</td>
<td>2585</td>
<td>2611</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>80.3 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 9" x 6". (e) 2. (f) Nil.
   (v) T—1242 (late). (vi) Irrigated. (vii) 2 to 3 intercultures with Japanese weedcr and 1 hand weeding.
   (viii) Nil. (ix) Nil. (x) N.A.

2. **TREATMENTS:**
   6 dates of lodging the crop artificially: S0 = Control, S1 = 15.10.1955 (pre-flowering), S2 = 25.10.1955 (pre-flowering), S3 = 4.11.1955 (flowering), S4 = 14.11.1955 (post-flowering) and S5 = 24.11.1955 (post-flowering).

3. **DESIGN:**
   (i) R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) 40' x 4'. (b) N.A. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory. (ii) and (iii) N.A. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**
   (i) 1910 lb./ac. (ii) 1410 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2513</td>
<td>1354</td>
<td>1637</td>
<td>2018</td>
<td>2282</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>57.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Crop:* Paddy *(Kharif)*.  
*Site:* Central Rice Research Instt., Cuttack.  
*Type:* 'C'.

Object:—To compare the effect of different methods of interculturing on the yield of Paddy.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 12" x 6". (e) 2 to 3. (f) Nil. (v) T—1242 (late). (vi) Irrigated. (vii) As per treatments. (viii) Nil. (ix) 72.71". (x) N.A.

2. **TREATMENTS:**
   4 cultural treatments: C0 = Control (no operation), C1 = Interculturing with country plough between the rows, C2 = Interculturing with Japanese weeder and C3 = Hand weeding.

3. **DESIGN:**
   (i) R.B.D. (ii) 4. (b) N.A. (iii) 8. (iv) (a) 30' x 15'. (b) N.A. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**
   (i) 2102 lb./ac. (ii) 1018 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2188</td>
<td>2100</td>
<td>2011</td>
<td>2108</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>36.0 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Crop:* Paddy *(Kharif).*  
*Site:* Central Rice Res. Instt., Cuttack.  
*Type:* 'C'.

Object:—To compare the effect of different methods of interculturing on the yield of Paddy.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) As per treatments. (ix) 39.47'. (x) N.A.

2. TREATMENTS:
   Same as in exp. no. 55(24) on page 63.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 32'X14'. (v) N.A. (vi) Yes.

4. GENERAL:
   Same as in exp. no. 55(24) on page 63.

5. RESULTS:
   (i) 2060 lb./ac. (ii) 435.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1900</td>
<td>1966</td>
<td>2107</td>
<td>2268</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>177.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.
Ref :- C.R.R.I. 58(18).
Type :- 'C'.

Object :- To compare the effect of different methods of interculturating on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) As per treatments. (ix) 39.47'. (x) N.A.

2. TREATMENTS:
   Same as in exp. no. 55(24) on page 63.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 32'X14'. (v) N.A. (vi) Yes.

4. GENERAL:
   Same as in exp. no. 55(24) on page 63.

5. RESULTS:
   (i) 1744 lb./ac. (ii) 159.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1727</td>
<td>1763</td>
<td>1785</td>
<td>1700</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>56.4 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.
Ref :- C.R.R.I. 54(23).
Type :- 'C'.

Object :- To study the effect of ridging on the yield of Paddy.
1. BASAL CONDITIONS:

(i) (a) Nil. (b) Rice. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A.
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) 40 lb./ac. (d) As per treatment. (e)
2 to 3. (v) Nil. (vi) T—1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1
hand weeding. (ix) 55.21". (x) N.A.

2. TREATMENTS:

Main-plot treatments:
2 levels of ridging : \( R_0 = \) No ridging and \( R_1 = \) Ridging.

Sub-plot treatments:
4 methods of sowing: \( M_1 = \) Behind the country plough with 12" \( \times \) 5" spacing, \( M_2 = \) Behind the Cooper plough with 15" \( \times \) 4" spacing, \( M_3 = \) Behind the Cooper plough with 12" \( \times \) 5" spacing and \( M_4 = \) Transplanted with 12" \( \times \) 5" spacing.

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/replication : 4 sub-plots/main-plot. (b) N.A. (iii) 8. (iv) (a) 60" \( \times \) 24".
(b) 43.5" \( \times \) 23". (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Yield of grain.
(iv) (a) \( 95\% \) cent. (b) No. (c) df=(vii) Nil.

5. RESULTS:

(i) 2544 lb./ac. (ii) (a) and (b) N.A. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>( M_4 )</th>
<th>( M_0 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R_0 )</td>
<td>2450</td>
<td>2579</td>
<td>2573</td>
<td>2489</td>
<td>2523</td>
</tr>
<tr>
<td>( R_1 )</td>
<td>2673</td>
<td>2573</td>
<td>2698</td>
<td>2313</td>
<td>2564</td>
</tr>
<tr>
<td>Mean</td>
<td>2562</td>
<td>2576</td>
<td>2636</td>
<td>2401</td>
<td>2544</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. \( R \) marginal means

2. \( M \) marginal means

3. \( M \) means at the same level of \( R \)

4. \( R \) means at the same level of \( M \)

Crop :- Paddy (Kharif).

Site :- Central Rice Res. Instt., Cuttack.

Ref :- C.R.R.I. 55(20).

Type :- 'C'.

Object :- To determine the effect of ridging on the yield of Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A.
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) 40 lb./ac. (d) As per treatment. (e)
2 to 3. (v) Nil. (vi) T—1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1
hand weeding. (ix) 72.71". (x) N.A.

2. TREATMENTS to 4. GENERAL:

Same as in expt. no. 54(25) on page 61.

5. RESULTS:

(i) 2118 lb./ac. (ii) (a) and (b) N.A. (iii) None of the effects is significant. (iv) Av. yield of grain in
lb./ac.
Crop: Paddy.  
Site: Central Rice Res. Instt., Cuttack.  
Ref: C.R.R.I. 59(23).  
Type: 'C'.

Object:—To study the effect of different spacings on the incidence of stem borer and yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Alluvial clay loam (b) Refer soil analysis, C.R.R.I., Cuttack. 
   (iii) N.A. (iv) (a) 2 ploughings. (b) Transplanted. (c) 20 lb./ac. (d) As per treatments. (e) 1. (v) 20 
   lb./ac. of N as A/S. (vi) PTB—10. (vii) Irrigated. (viii) Hand weeding. (ix) and (x) N.A.

2. TREATMENTS:
   4 spacing treatments: $s_1=6''\times3''$, $s_2=6''\times6''$, $s_3=12''\times3''$ and $s_4=12''\times12''$.

3. DESIGN:
   (i) R.B.D. (ii) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 9''x14''. (v) 2 rows around. (vi) Yes.

4. GENERAL:
   (i) Moderate. (ii) Stem-borer. (iii) Nil. (iv) (a) 1950—only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 4192 lb./ac. (ii) 700.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain 
   in lb./ac.

```
<table>
<thead>
<tr>
<th>Treatment</th>
<th>$s_1$</th>
<th>$s_2$</th>
<th>$s_3$</th>
<th>$s_4$</th>
<th>Av. yield</th>
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<tr>
<td></td>
<td>4089</td>
<td>4397</td>
<td>2776</td>
<td>5505</td>
<td></td>
</tr>
</tbody>
</table>
```
   S.E./mean = 350.2 lb./ac.
2. TREATMENTS:
Main-plot treatments:
4 spacings: \( S_1 = 6" \times 3" \), \( S_2 = 6" \times 6" \), \( S_3 = 6" \times 9" \) and \( S_4 = 6" \times 12" \).
Sub-plot treatments:
Number of seedlings/hill: \( R_1 = 2 \), \( R_2 = 5 \) and \( R_3 = 8 \).

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 12" x 10". (iv) (a) 15" x 14". (v) Yes.

4. GENERAL:
(i) Poor. (ii) Heavy haff. (iii) Heavy rains in October. (iv) Nil. (v) Nil. (vi) Nil.

5. RESULTS:
(i) 1569 lb./ac. (ii) 131 lb./ac. (b) 271 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( S_4 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R_1 )</td>
<td>1725</td>
<td>1395</td>
<td>1401</td>
<td>1519</td>
<td>1518</td>
</tr>
<tr>
<td>( R_2 )</td>
<td>1966</td>
<td>1764</td>
<td>1597</td>
<td>1525</td>
<td>1713</td>
</tr>
<tr>
<td>( R_3 )</td>
<td>1419</td>
<td>1637</td>
<td>1788</td>
<td>1721</td>
<td>1641</td>
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<tr>
<td>Mean</td>
<td>1713</td>
<td>1599</td>
<td>1595</td>
<td>1588</td>
<td>1624</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. S marginal means = 75.6 lb./ac.
2. R marginal means = 137.0 lb./ac.
3. R means at the same level of S = 274.0 lb./ac.
4. S means at the same level of R = 236.1 lb./ac.

---

CROP: Paddy (Khari)  
SITE: Central Rice Res. Inst., Cuttack  
Ref: C.R.R.I. 58(30).  
Type: 'C'.

Object: To study the effect of different pulse crops on the succeeding Paddy crops.

1. BASAL CONDITIONS:
(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Clay loam (low-land). (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 7.7.1958/29.8.1958. (iv) (a) Ploughing and laddering. (b) Transplanted. (c) 25 lb/ac. (d) 6" x 6", (e) 2 to 3. (v) 30 lb/ac. of \( P_2 O_5 \) as Super. (vi) T-141. (vii) Irrigated. (viii) 2 to 3 intercultures and hand weeding. (ix) N.A. (x) 16.12.1958.

2. TREATMENTS:
6 pulse crops preceding paddy crop: \( C_0 = \) Fallow, \( C_1 = \) Mung for seed, \( C_2 = \) Gram, \( C_3 = \) Kulthi, \( C_4 = \) Cowpea and \( C_5 = \) Black gram.

3. DESIGN:
(i) R.B D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 32" x 19.5". (b) 30" x 17.5". (v) Two rows around. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Spraying with foliodol against beetle. (iii) Nil. (iv) (a) 1958—1959. (b) Yes. (c) Nil. (v) to (vi) Nil.

5. RESULTS:
(i) 1569 lb./ac. (ii) 253 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
Treatment & C9 & C4 & C3 & C2 & C1 & C6 & S.E./mean = 126.5 lb./ac.
Av. yield 1599 1414 1597 1535 1613 1713

Crop = Paddy.

Ref. C.R.R.I. 59(9).

Site: Central Rice Res. Inst., Cuttack.

Type = 'C'.

Object = To study the effect of different pulse crops on the succeeding Paddy crop.

1. BASIC CONDITIONS:
(i) (a) Paddy—Pulses. (b) As per treatments. (c) 30 lb./ac. of P2O5. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 26.6.1959/24.8.1959. (iv) 2 disc ing puddling and laddering. (b) Transplanted after dry nursery. (c) 25 lb./ac. (d) 6′x6′. (e) 2 to 3. (v) 20 lb./ac. of N. (vi) T—141. (vii) Irrigated. (viii) Inter culture and weeding. (ix) 7.12.1959.

2. TREATMENTS:
6 pulse crops preceding Paddy: C0 = Fallow, C1 = Mung, C2 = Gram, C3 = Kalihi, C4 = Cowpea and C6 = Biri.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 32′x19.5′. (b) 30′x17.5′. (v) 1′x1′. (v) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—1959. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains in October, 1959. (vii) Nil.

5. RESULTS:
(i) 1621 lb./ac. (ii) 213.75 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Treatment C0 C1 C2 C3 C4 C6
Av. yield 1827 1412 1535 1617 1591 1524
S.E./mean = 111.88 lb./ac.


Site: Central Rice Res. Inst., Cuttack.

Type = 'C'.

Object = To find out a suitable rotation system for lands with irrigation facilities.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rice. (c) A/C at 20 lb./ac. of N. (ii) (a) Light soil. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 23.7.1956. (iv) (a) 3 to 4 ploughings followed by puddling and laddering. (b) Transplanted (c) 25 lb./ac. (d) 6′x6′ for PTB—10 and 10′x6′ for T—141. (e) 2 to 3. (f) 20 lb./ac. of N as A/C. (g) T—141 (main). (h) Irrigated. (i) Inter culture and weeding. (ix) N.A. (x) 5.12.1956.

2. TREATMENTS:

3. DESIGN:
(i) L.S.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 39′x141′. (b) 43′x121′. (v) 10′x12′. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Tiller counts, height, yield of grain and straw. (iv) (a) 1956—1960. (b) Yes. (c) NIL (v) to (vi) NIL.
5. RESULTS:
(i) 2406 lb./ac. (ii) 108.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2845</td>
<td>2574</td>
<td>2024</td>
<td>2180</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>51.0 lb./ac.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Crop: Rice.  
Site: Central Rice Res. Instt., Cuttack.  
Ref: C.R.R.I. 57(29).  
Type: ‘C’.

Object: To find out a suitable rotation system for lands with irrigation facilities.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) As per treatments. (c) 20 lb./ac. of N as A/C. (ii) (a) Light soil. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 23.7.1957/31.8.1957. (iv) (a) 3 to 4 ploughings followed by puddling and laddering. (b) Transplanted. (c) 25 lb./ac. (d) 10" × 6". (e) 2 to 3. (v) 20 lb./ac. of N as A/C. (vi) T-141 (main). (vii) Irrigated. (viii) Inter- and sub-culture and weeding. (ix) N.A. (x) 21.12.1957.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 56(23) on page 68.

5. RESULTS:
(i) 2761 lb./ac. (ii) 152 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
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<tbody>
<tr>
<td>Av. yield</td>
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<td>2862</td>
<td>2379</td>
<td>2794</td>
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<tr>
<td>S.E./mean</td>
<td>76.0 lb./ac.</td>
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</table>

Crop: Rice (Kharif and Rabi).  
Site: Central Rice Res. Instt., Cuttack.  
Ref: C.R.R.I. 58(29).  
Type: ‘C’.

Object: To find out a suitable rotation system for lands with irrigation facilities.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) As per treatments. (c) 20 lb./ac. of N as A/C. (ii) (a) Light soil. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 2.7.1958/1.9.1958. (iv) (a) 3 to 4 ploughings followed by puddling and laddering. (b) Transplanted. (c) 25 lb./ac. (d) 10" × 6". (e) 2 to 3. (v) 20 lb./ac. of N as A/C. (vi) T-141. (vii) Irrigated. (viii) Inter- and sub-culture and weeding. (ix) N.A. (x) 2.12.1958.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 57(23) on page 68.

5. RESULTS:
(i) 2473 lb./ac. (ii) 164.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2575</td>
<td>2476</td>
<td>2355</td>
<td>2485</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>82.0 lb./ac.</td>
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<td></td>
</tr>
</tbody>
</table>
Crop: Paddy.  
Site: Central Rice Res. Instit., Cuttack.  
Ref: C.R.R.I. 59(16).  
Type: 'C'.

Object: To find out a suitable rotation system for lands with irrigation facilities.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) As per treatments. (c) 20 lb./ac. of N as A/S for treatments R1, R2 and R4. (ii) (a) Light soil. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 17.7.1953/26.8.1959. (iv) (a) 3 to 4 ploughings followed by puddling and laddering. (b) We nursery. (c) 25 lb./ac. (d) 9" x 6" and 6" x 6". (e) 2 to 3. (v) Nil. (vi) T—141 and PT—10. (vii) Irrigated. (viii) Interculture and weeding. (ix) 48.55". (x) 24.12.1959.

2. TREATMENTS:

3. DESIGN:
   (i) L. Sq. (ii) 4. (b) N.A. (iii) 4. (iv) (a) 30" x 15". (b) 48" x 13.6". (v) 1" x 9". (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Tiller Counts height, grain and straw weight. (iv) (a) 1956—1960. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2671 lb./ac. (ii) 93.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
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<td>2803</td>
<td>46.6</td>
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<tr>
<td>R2</td>
<td>2791</td>
<td></td>
</tr>
<tr>
<td>R3</td>
<td>2595</td>
<td></td>
</tr>
<tr>
<td>R4</td>
<td>2495</td>
<td></td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).  
Site: Central Rice Res. Instit., Cuttack.  
Ref: C.R.R.I. 54(23).  
Type: 'CV'.

Object: To study the effect of different sowing practices on the yield of different Paddy varieties.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) As per treatments. (iv) (a) 4 ploughings, laddering and levelling. (b) As per treatments. (c) N.A. (d) 12" x 6". (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 55.54". (x) N.A.

2. TREATMENTS:
   Main-plot treatments
   2 varieties: V1=T—411 (medium) and V2=T—1242 (late).

   Sub-plot treatments

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 8. (iv) (a) 30" x 20", (b) 28" x 18", (v) 1" x 1". (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1953—contd. (b) No. (c) Nil (v) to (vii) Nil.

5. RESULTS:
   (i) 3401 lb./ac. (ii) (a) 128.5 lb./ac. (b) 238.3 lb./ac. (iii) M effect and M x V interaction are highly significant. (iv) Av. yield of grain in lb./ac.
Crop: Paddy \( (\text{Kharif}) \)

Site: Central Rice Res. Inst., Cuttack.

Ref: C.R.R.I. 55(22).

Type: ‘CV’.

Object: To assess the merits of different sowing practices for Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A.  
(ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I. Cuttack.  
(iii) Per treatments.  
(iv) (a) 4 ploughings, laddering and levelling. (b) Per treatments.  
(c) 61 lb./ac.  
(d) 12’ x 5’. (e) 2 to 3. (v) Nil. (vi) Per treatments.  
(vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weed and 1 hand weeding. (ix) 72.71”. (x) N.A.

2. TREATMENTS:

Main-plot treatments:
2 varieties: \( V_1 = \text{T-141} \) (medium) and \( V_2 = \text{T-1242} \) (late)

Sub-plot treatments:
3 methods of sowing: \( M_1 = \) Transplanting on 24.7.1955, \( M_2 = \) Dibble sown dry on 21.6.1955, and \( M_3 = \) Dibble sown in puddle on 21.7.1955.

3. DESIGN and 4. GENERAL:
Same as in exp. no. 54(23) on page 70.

5. RESULTS:
(i) 2072 lb./ac.  
(ii) (a) 182.4 lb./ac. (b) 167.8 lb./ac. (iii) All effects are highly significant.  
(iv) Av yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>2383</td>
<td>1654</td>
<td>2478</td>
<td>2165</td>
</tr>
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<td>( V_2 )</td>
<td>2196</td>
<td>1831</td>
<td>1911</td>
<td>1979</td>
</tr>
<tr>
<td>Mean</td>
<td>2280</td>
<td>1742</td>
<td>2194</td>
<td>2072</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. V marginal means = 52.6 lb./ac.
2. M marginal means = 59.3 lb./ac.
3. M means at the same level of V = 83.9 lb./ac.
4. V means at the same level of M = 86.4 lb./ac.

---

<table>
<thead>
<tr>
<th></th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
<td>( V_1 )</td>
<td>2383</td>
<td>1654</td>
<td>2478</td>
<td>2165</td>
</tr>
<tr>
<td>( V_2 )</td>
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<tr>
<td>Mean</td>
<td>2280</td>
<td>1742</td>
<td>2194</td>
<td>2072</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. V marginal means = 52.6 lb./ac.
2. M marginal means = 59.3 lb./ac.
3. M means at the same level of V = 83.9 lb./ac.
4. V means at the same level of M = 86.4 lb./ac.
Crop: Paddy (Kharif).  
Site: Central Rice Res. Instt., Cuttack.  
Ref: C.R.R.I. 57(23).  
Type: 'CV'.

Object: To determine the effect of different dates of planting on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (iii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I. Cuttack. (iii) N.A. (iv) (a) 4 ploughings, land-levelling and levelling. (b) Transplanted. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 insecticides with Japanese weeders and 1 hand weeding. (ix) 29.47". (v) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(2) 2 varieties: $V_1=T-124$ (late) and $V_2=BAM-9$ (late) for one experiment and $V'_1=T-141$ (medium) and $V'_2=J-192$ (medium) for another experiment.

3. DESIGN:
(i) Fact in R.B.D. (ii) (a) 14. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1744.6 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1577—cond. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Two separate experiments were conducted in factorial design, one with late varieties and the other with medium varieties.

5. RESULTS:
For late varieties
(i) 2473 lb./ac. (ii) 415.6 lb./ac. (iii) Main effect of D is highly significant and interaction D×V is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>$D_3$</th>
<th>$D_4$</th>
<th>$D_5$</th>
<th>$D_6$</th>
<th>$D_7$</th>
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<td>$V_1$</td>
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<td>3281</td>
<td>2995</td>
<td>2133</td>
<td>2499</td>
<td>2066</td>
<td>642</td>
<td>2515</td>
</tr>
<tr>
<td>$V_2$</td>
<td>3513</td>
<td>3553</td>
<td>3188</td>
<td>3220</td>
<td>1894</td>
<td>1517</td>
<td>535</td>
<td>2431</td>
</tr>
<tr>
<td>Mean</td>
<td>3641</td>
<td>3417</td>
<td>3041</td>
<td>2667</td>
<td>2197</td>
<td>1762</td>
<td>589</td>
<td>2473</td>
</tr>
</tbody>
</table>

S.E. of D marginal mean = 120.0 lb./ac.
S.E. of V marginal mean = 64.1 lb./ac.
S.E. of body of table = 169.7 lb./ac.

For medium varieties
(i) 2694 lb./ac. (ii) 419.0 lb./ac. (iii) Main effects of V and D are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>$D_3$</th>
<th>$D_4$</th>
<th>$D_5$</th>
<th>$D_6$</th>
<th>$D_7$</th>
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<td>3612</td>
<td>2718</td>
<td>2778</td>
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<td>1922</td>
<td>1210</td>
<td>2572</td>
</tr>
<tr>
<td>$V'_2$</td>
<td>3318</td>
<td>3649</td>
<td>3295</td>
<td>3016</td>
<td>2690</td>
<td>2356</td>
<td>1410</td>
<td>2816</td>
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<td>2897</td>
<td>2462</td>
<td>2129</td>
<td>1310</td>
<td>2694</td>
</tr>
</tbody>
</table>

S.E. of D marginal mean = 120.9 lb./ac.
S.E. of V' marginal mean = 64.7 lb./ac.
S.E. of body of table = 171.1 lb./ac.
Crop: Paddy (Kharif).
Ref. : C.R.R.I. 58(17).
Site: Central Rice Res. Instt., Cuttack.
Type: CV.

Object: To determine the effect of different dates of planting on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (i) (a) Clay loam. (b) Refer soil analysis, C.R.R.I. Cuttack. (ii) As per treatments. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 9' x 6'. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 57.94'. (x) N.A.

2. TREATMENTS:
Main-plot treatments
2 varieties: V1 = T-141 and V2 = J-192 for medium varieties and V1' = T-1242 and V2' = BAM-9 for late varieties.
Sub-plot treatments

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication and 7 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 20' X 3.75'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) 2 separate experiments were conducted one with late varieties and another with medium varieties.

5. RESULTS:
For medium varieties

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
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<td>V1</td>
<td>2622</td>
<td>2591</td>
<td>2094</td>
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<td>1807</td>
<td>1691</td>
<td>1346</td>
<td>1280</td>
<td>1768</td>
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<tr>
<td>Mean</td>
<td>2515</td>
<td>2389</td>
<td>1875</td>
<td>1993</td>
<td>1666</td>
<td>1270</td>
<td>1105</td>
<td>1830</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 65.4 lb./ac.
2. D marginal means = 131.6 lb./ac.
3. D means at the same level of V = 180.1 lb./ac.
4. V means at the same level of D = 194.3 lb./ac.

For late varieties

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
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<td>1078</td>
<td>760</td>
<td>1676</td>
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<tr>
<td>V2'</td>
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<td>2331</td>
<td>1827</td>
<td>1381</td>
<td>1140</td>
<td>962</td>
<td>652</td>
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<tr>
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<td>2371</td>
<td>1772</td>
<td>1540</td>
<td>1240</td>
<td>1020</td>
<td>706</td>
<td>1611</td>
</tr>
</tbody>
</table>
Object: To compare the yielding capacity of seedlings raised under different methods for Paddy.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I. Cuttack. (iii) N.A. (iv) (a) 4 ploughings, ladder ing and levelling. (b) Transplanted. (c) N.A. (d) 9" x 6". (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 9'x6'. (x) N.A.

2. **TREATMENTS**:
   All combinations of (1) and (2)
   (1) 2 varieties: $V_1$ = BAM-9 and $V_2$ = T-1242.
   (2) 3 methods of sowing: $M_1$ = Seedlings raised under Japanese method, $M_2$ = Dibbled in country plough furrows and $M_3$ = Sown by broadcast method and covered by country plough.

3. **DESIGN**:
   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 12. (iv) (a) 20' x 9'. (b) 19' x 8'. (v) 1 row around. (vi) Yes.

4. **GENERAL**:
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS**:
   (i) 3358 lb./ac. (ii) 229.0 lb./ac. (iii) Main effect of $V$ alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>$V_1$</td>
<td>3745</td>
<td>3795</td>
<td>3786</td>
<td>3775</td>
</tr>
<tr>
<td>$V_2$</td>
<td>3115</td>
<td>3219</td>
<td>3185</td>
<td>3173</td>
</tr>
<tr>
<td>Mean</td>
<td>3430</td>
<td>3507</td>
<td>3486</td>
<td>3474</td>
</tr>
<tr>
<td>S.E. of $V$ marginal mean</td>
<td>= 38.2 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E. of $M$ marginal mean</td>
<td>= 46.7 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E. of body of table</td>
<td>= 96.1 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Object: To compare the yielding capacity of seedlings raised under different methods for Paddy.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I. Cuttack. (iii) 5.8.1955. (iv) (a) 4 ploughings, ladder ing and levelling. (b) Transplanted. (c) N.A. (d) 9" x 6". (e) 2. (f) Nil. (vi) BAM—9 and T—1242 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 72.7'. (a) Nil.
2. TREATMENTS to 4. GENERAL:
   
   Same as in exp. no. 54(24) on page 74.

5. RESULTS:
   
   (i) 2342 lb./ac. (ii) 134.0 lb./ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>2496</td>
<td>2499</td>
<td>2466</td>
<td>2487</td>
</tr>
<tr>
<td>V₂</td>
<td>2187</td>
<td>2212</td>
<td>2193</td>
<td>2197</td>
</tr>
</tbody>
</table>

   S.E. of V marginal mean = 22.3 lb./ac.
   S.E. of M marginal mean = 27.4 lb./ac.
   S.E. of body of table = 38.7 lb./ac.

---

Object :- To study the differential response of different varieties of Paddy to the various times of application of N.

1. BASAL CONDITIONS:
   
   (i) (a) Fallow - Rice. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I. Cuttack.
   (iii) 5.7.1958/22.8.1958. (iv) (a) Summer ploughing once, tractor ploughing once, tolock ploughing and laddering. (b) Transplanted. (c) 25 lb./ac. (d) 9" x 9". (e) 2 to 3. (v) Nil. (vi) As per treatment. (vii) Irrigated. (viii) Weeding by Japanese weeder. (ix) N.A. (x) 22 and 23.12.1958.

2. TREATMENTS:
   
   **Main-plot treatments**
   
   8 split applications of N at 40 lb./ac.: T₀=Control (No nitrc-gen), T₁=At planting. T₂=One month after planting, T₃=One month before flowering, T₄=Half at planting+half one month later, T₅=Half at planting+half one month before flowering, T₆=Half one month after planting+half one month before flowering and T₇=½ at planting+½ one month later+½ one month before flowering.

   **Sub-plot treatments**
   
   5 varieties: V₁=T₁-1247, V₂=AKP-4, V₃=CR-10, V₄=EAM-9 and V₅=PTB-16.

3. DESIGN:
   
   (i) Split-plot. (ii) 8 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12" x 14"; (b) 10" x 13". (v) One row around. (vi) Yes.

4. GENERAL:
   
   (i) Poor. (ii) Nil. (iii) Height, tiller counts and yield of grain. (iv) (a) 1958-1960. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   
   (i) 1866 lb./ac. (ii) (a) 384.0 lb./ac. (b) 318.0 lb./ac. (iii) Main effects of V and T are highly significant. (iv) Av. yield of grain in lb./ac.
To T, T, T, T, v, 2010 2218 2406 2598 2365
v, 1190 1411 1554 1592 1478 1532
v, 1356 1848 2119 2272 1940 2059
V, 2173 2253 2301 2199 2349 2355
V, 763 1091 1034 1133 1037
Mean 1764 1882 2024 1882 2059

S.E. of difference of two
1. T marginal means = 123.0 lb./ac.
2. V marginal means = 156.0 lb./ac.
3. V means at the same level of T = 225.0 lb./ac.
4. T means at the same level of V = 235.0 lb./ac.

---

**Crop : Paddy (Kharif).**

**Site : Central Rice Res. Inst., Cuttack.**

Ref : C.R.R.I. 59(14).

Type : ‘MV’.

Object : To study the effect of different times of application of N on the yield of different varieties of Paddy.

1. **BASAL CONDITIONS :**
   (i) (a) Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.
   (iii) 6.7.1959/20.8.1959. (iv) (a) Tractor ploughing followed by bullock drawn iron-plough. (b) Transplanted after dry nursery. (c) 25 lb./ac. (d) 5' X 6'. (e) 2 to 3. (f) Nil. (g) As per treatments. (h) Irrigated. (i) Interculture and weeding. (ix) 47'. (x) V1 to V4 on 23.12.1959 and V5 on 8.1.1960.

2. **TREATMENTS :**
   Same as in exp. no. 58(28) on page 75.

3. **DESIGN :**
   (i) Split-plot. (ii) 8 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12' X 14.5'. (b) 10' X 13'. (v) 12' X 9'. (vi) Yes.

4. **GENERAL :**
   (i) Poor. (ii) No. (iii) Height, tiller counts and yield of grain. (iv) (a) 1938–1963. (b) Yes. (c) Nil. (v) nil and (b) Nil. (vi) Low rainfall in September and heavy rains in October affected the crop. (vii) Nil.

5. **RESULTS :**
   (i) 1489 lb./ac. (ii) (a) 476 lb./ac. (b) 288 lb./ac. (iii) V effect is highly significant. T effect is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>1534</td>
<td>2000</td>
<td>1420</td>
<td>1801</td>
<td>1833</td>
<td>1969</td>
<td>1650</td>
<td>1776</td>
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<tr>
<td>V2</td>
<td>1018</td>
<td>1814</td>
<td>1545</td>
<td>1534</td>
<td>1665</td>
<td>1755</td>
<td>1786</td>
<td>1691</td>
</tr>
<tr>
<td>V3</td>
<td>1148</td>
<td>1717</td>
<td>1587</td>
<td>1806</td>
<td>1624</td>
<td>1780</td>
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<td>V4</td>
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<td>2100</td>
</tr>
<tr>
<td>V5</td>
<td>390</td>
<td>402</td>
<td>430</td>
<td>296</td>
<td>603</td>
<td>760</td>
<td>474</td>
<td>356</td>
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<tr>
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<td>1611</td>
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<td>1470</td>
</tr>
</tbody>
</table>
Crop - Paddy.  
Site - Central Rice Res. Instt., Cuttack.

Object:—To study the optimum time of planting of different varieties in second crop season.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) As per treatments. (iv) (a) 4 ploughings, ladder ing and levelling. (b) Transplanted. (c) 25 lb./ac. (d) 6' x 6'. (e) 2 to 3. (f) Nil. (g) As per treatments. (h) Irrigated. (i) (a) 82.73'. (b) N.A.

2. TREATMENTS:
   Main-plot treatments:

   Sub-plot treatments:
   6 varieties : \( V_1 = \text{PTB-10}, V_2 = \text{CH-62}, V_3 = \text{CH-63}, V_4 = \text{MTU-15}, V_5 = \text{CB-1} \) and \( V_6 = \text{Tepa-1} \).

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' x 8.5'. (b) 18' x 6.5'. (c) 1' x 1'. (v) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Grain and straw yield, height and ear-length measurements. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1699 lb./ac. (ii) 185.0 lb./ac. (b) 167.0 lb./ac. (iii) All effects are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>( V_4 )</th>
<th>( V_5 )</th>
<th>( V_6 )</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
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<td>750</td>
<td>295</td>
<td>542</td>
<td>2110</td>
<td>1364</td>
<td>1470</td>
<td>1088</td>
</tr>
<tr>
<td>( D_2 )</td>
<td>1939</td>
<td>1367</td>
<td>1775</td>
<td>1653</td>
<td>1564</td>
<td>1784</td>
<td>1615</td>
</tr>
<tr>
<td>( D_3 )</td>
<td>2492</td>
<td>1917</td>
<td>1784</td>
<td>1246</td>
<td>1705</td>
<td>2144</td>
<td>1881</td>
</tr>
<tr>
<td>( D_4 )</td>
<td>2830</td>
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<td>2042</td>
<td>1576</td>
<td>2352</td>
<td>2500</td>
<td>2211</td>
</tr>
<tr>
<td>Mean</td>
<td>2003</td>
<td>1386</td>
<td>1435</td>
<td>1649</td>
<td>1746</td>
<td>1974</td>
<td>1699</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. D marginal means
2. V marginal means
3. V means at the same level of D
4. D means at the same level of V
Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.

Object: To study the effect of different sowing practices on the yield of different Paddy varieties.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) As per treatments. (iv) (a) 4 ploughings, laddering and levelling. (b) As per treatments. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.47°. (x) N.A.

2. TREATMENTS:
Main-plot treatments:
2 varieties: \( V_1 = T-141 \) (medium) and \( V_2 = T-142 \) (late).

Sub-plot treatments:
3 methods of planting: \( M_1 = \) Transplanted on 7.8.1957, \( M_2 = \) Puddle sown (wet) on 6.8.1957 (dibbled) and \( M_3 = \) Dibble behind country plough (dry) on 24.6.1957.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 30' x 20'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2921 lb./ac. (ii) 298.0 lb./ac. (iii) 217.9 lb./ac. (iii) Effect alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>2929</td>
<td>2741</td>
<td>2716</td>
<td>2769</td>
</tr>
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<td>( V_2 )</td>
<td>3027</td>
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</tr>
<tr>
<td>Mean</td>
<td>2978</td>
<td>2861</td>
<td>2896</td>
<td>2912</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 86.0 lb./ac.
2. M marginal means = 112.4 lb./ac.
3. M means at the same level of V = 159.0 lb./ac.
4. V means at the same level of M = 155.7 lb./ac.
2. TREATMENTS:
All combinations of (1), (2), (3), (4), (5) and (6)
(1) Seed rate (P).
(2) Seed bed preparation (Q).
(3) Seed bed manuring (R).
(4) Method of planting (S).
(5) Field manuring (T).
(6) Inter-culturing and weeding (U).
Each at two levels: (a) Local method and (b) Japanese method.

3. DESIGN:
(i) 2^5 conf. (Effects of pqr, pqst, rst, psu, qru, prtu confid). (ii) 8 blocks/replication; 8 plots/block.
(b) N.A.
(iii) (iv) (a) 60'×15'. (b) 8'4"×13'4". (v) 1 row around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Attack of leaf roller. Spraying with BHC 0.2 % against it. (iii) Grain and straw yield, height, tiller counts and ear-length measurements. (iv) (a) 1953—cond. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 358 lb./ac. (ii) 211.0 lb./ac. (iii) T effect is highly significant. Interactions S×T, Q×U and S×U are significant. (iv) Mean and differential response table of grain in lb./ac.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mean response</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pa</td>
<td>Pb</td>
<td>Qa</td>
<td>Qb</td>
<td>Ra</td>
<td>Rb</td>
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<td>96.3</td>
<td>—</td>
<td>—</td>
<td>158.6</td>
<td>34.0</td>
<td>57.4</td>
<td>135.2</td>
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<tr>
<td>Q</td>
<td>20.8</td>
<td>83.1</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<td>—</td>
</tr>
<tr>
<td>S</td>
<td>21.2</td>
<td>85.9</td>
<td>—</td>
<td>54.9</td>
<td>36.9</td>
<td>6.3</td>
<td>35.9</td>
</tr>
<tr>
<td>T</td>
<td>— 594.4</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>U</td>
<td>18.4</td>
<td>63.9</td>
<td>100.7</td>
<td>15.8</td>
<td>115.9</td>
<td>43.8</td>
<td>— 7.1</td>
</tr>
</tbody>
</table>

S.E. of mean response = 52.7 lb./ac.
S.E. of differential response = 74.6 lb./ac.

Crop :- Faddy (Kharif).
Site :- Central Rice Res. Inst., Cuttack.
Type :- ‘CM’.

Object :- To test the merits of various treatments recommended under the Japanese method of Paddy cultivation.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R, Cuttack. (iii) 19.6.1955/23.7.1955. (iv) (a) 6 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 10'×10', (e) 4. (v) Nil. (vi) T—141 (medium). (vii) Irrigated. (viii) As per treatments, (ix) 72.7', (x) 2.12.1955.

2. TREATMENTS:
All combinations of (1), (2), (3), (4) and (5)
(1) Seed rate (P).
(2) Seed bed preparation (Q).
(3) Seed bed manuring (R).
(4) Transplanting and weeding (S).
(5) Field manuring (T).
Each at 2 levels: (a) Local method and (b) Japanese method.
3. DESIGN:
(i) 2R confd. with pq, rest pqr confd. (ii) 8 plots/block; 4 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 30' x 15'. (b) 28' 4" x 13' 4". (v) 1 row around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. Lodging on 11.10.1955 in plots of Japanese field manuring. (ii) N.A. (iii) Grain and straw yield, height, tiller counts and ear-length measurements. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2265 lb./ac. (ii) 274.7 lb./ac. (iii) T effect is highly significant. (iv) Mean and differential response table of grain in lb./ac.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean response</th>
<th>Differential response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pa Pb Qa Qb Ra Rb Sa Sb Ta Tb</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>-0.7  -  -    -10.4  9.0  160.9 -162.2  23.8 -25.1 17.9 -19.2</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>155.8 146.1 165.3  -  -    254.9  56.8  58.8 252.9 330.4 -39.0</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>204.1 125.6 42.5  303.1 105.0  -  -    30.8 377.4 364.4 43.8</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>36.2  60.6 11.8  -60.9 133.2 -137.1 209.5  -  -    -96.8 171.0</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>-964.9 -946.4 -983.5 -770.1 -1159.8 -804.6 -1132.2 -1099.8 -829.8 - -</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of mean response = 68.7 lb./ac.
S.E. of differential response = 57.1 lb./ac.

Crop = Paddy (Kharif).
Site = Central Rice Res. Instt., Cuttack.
Object = To compare the Chinese method with the Japanese method and the Local improved method of Paddy cultivation.

1. BASAL CONDITIONS:
(i) (a) Fallow—Paddy, (b) Fallow, (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack (iii) 5.7.1959 for M 1 and M 2 and 15.7.1959 for M 3/10.8.1959. (iv) (a) The field was tractor disc ed Bunds were raised and digging of the soil was taken up in M 2 only. (b) to (e) As per treatments. (v) As per treatments. (vi) BAM—9 (165 days). (vii) Irrigated. (viii) As per treatments. (ix) 45.0", (x) 17 and 18.11.1959.

2. TREATMENTS:
3 methods of cultivation: M 1 = Local improved method: 2 to 3 hand weedicings and 3 weeks after transplanting at intervals of 2 to 3 weeks, transplanted in dry nursery at 25 lb./ac. of 10" x 6", 2 to 3 seedlings/hole basal dressing of 4000 lb./ac. of compost,
M 2 = Japanese method: 3 to 5 intercultings, transplanted in dry nursery at 16 lb./ac. 10" x 10" 4 seedlings/hole basal dressing of 4000 lb./ac. of G.M. and
M 3 = Chinese method: At least of 20 hoeings, transplanted in wet nursery at 20 lb./ac., 6" x 6", seedlings/hole basal dressing of 20 tons of compost.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 30' x 30'. (b) N.A. (v) Chinese 5 rows around, Japanese 3 rows around and Local 3 rows on 10' side and 5 rows on 6'. (vi) Yes.

4. GENERAL:
(i) Some lodging in M 2 but heavy lodging in M 3. (ii) Attack of blast in severe in M 2. Spraying with copper at 5 lb./ac. in 100 gal/ac. (iii) Tiller counts and height of plants. (iv) (a) 1959 only. (b) No. (c) Nil. (v) (a) 30 centres all over the country. (b) Nil. (vi) Heavy rain in Oct. (vii) Nil.
RESULTS:

(i) 2624 lb./ac.  (ii) 182.9 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2625</td>
<td>2287</td>
<td>2661</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>74.7 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compliment:

Crop: Paddy (Kharif),  
Site: Central Rice Res. Instt., Cuttack.  
Type: CMV.

Object: To determine the optimum spacing and suitable time of planting for different varieties under different manuring conditions.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Paddy.  (c) N.A.  (ii) (a) Clay loam.  (b) Refer soil analysis, C.R.R.I., Cuttack.  (iii) 1.5!958, 5 and 6.6!958, 27.5!958/3 and 4.6!958, 5.7!958, 2 and 4.8!958.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanted.  (c) N.A.  (d) As per treatments.  (e) 2 to 3.  (v) Nil.  (vi) As per treatments.  (vii) Irrigated.  (viii) 2 to 3 intercisions with Japanese weeder and 1 hand weeding.  (ix) 37.94".  (x) N.A.

2. TREATMENTS:

Main-plot treatments:

Horizontal strip:

3 times of planting: D₁ ~ 1.6!958, D₂ ~ 7.7!958 and D₃ ~ 8.8!958.

Perpendicular strip:

5 levels of manure: M₁ = Control (no manure), M₂ = 30 lb./ac. of P₂O₅ and M₃ = 60 lb./ac. of N+50 lb./ac. of P₂O₅.

Sub-plot treatments:

All combinations of (1) and (2)

(1) 3 spacings: S₁ = 6" x 6", S₂ = 12" x 6" and S₃ = 18" x 6".

(2) 3 varieties: V₁ ~ P.T.B.-JO, V₂ = S.L.0.-9 and V₃ ~ T-1242.

3. DESIGN:

(i) Strip-cum-split plot.  (ii) (a) 81.  (b) 41' x 41'.  (iii) 2.  (iv) (a) 12' x 12'.  (b) 10' x 5'.  (v) 1' x 1 5'.  (vi) Yes.

4. GENERAL:

(i) Satisfactory.  (ii) N.A.  (iii) Yield of grain.  (iv) (a) N.A.  (b) N.O.  (c) Nil.  (v) (a) and (b) No.  (vi) Expt. originally laid out with 3 replications, but one replication failed.  (vii) Nil.

5. RESULTS:

(i) 1864 lb./ac.  (ii) (a) 978.8 lb./ac. for D.  (b) 174.2 lb./ac. for M.  (c) 925.9 lb./ac. for M × D.  (d) 438.0 lb./ac. for others.  (iii) Main effect of D and V and interactions V × D, V × M and V × S are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>Mean</th>
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<td>469</td>
<td>661</td>
<td>955</td>
<td>105</td>
<td>1263</td>
<td>717</td>
<td>805</td>
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<tr>
<td>D₂</td>
<td>2275</td>
<td>2402</td>
<td>2312</td>
<td>1760</td>
<td>2144</td>
<td>3101</td>
<td>2262</td>
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<tr>
<td>D₃</td>
<td>2573</td>
<td>2567</td>
<td>2245</td>
<td>2122</td>
<td>2453</td>
<td>3110</td>
<td>2551</td>
</tr>
<tr>
<td>Mean</td>
<td>1772</td>
<td>1876</td>
<td>1942</td>
<td>1329</td>
<td>1953</td>
<td>2099</td>
<td>1873</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M₁</td>
<td>1803</td>
<td>1933</td>
<td>1893</td>
<td>1846</td>
</tr>
<tr>
<td>M₂</td>
<td>1795</td>
<td>1850</td>
<td>2020</td>
<td>1873</td>
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<td>M₃</td>
<td>1719</td>
<td>1847</td>
<td>1924</td>
<td>1767</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y₁</td>
<td>2213</td>
<td>2226</td>
<td>2389</td>
<td>2359</td>
</tr>
</tbody>
</table>

Ref.: - C.R.R.I. 58(22).
Crop :- Paddy /Kharif.
Site :- Central Rice Res. Instit., Cuttack.

Ref :- C.R.R.I. 59(2).

Type :- 'CMV'.

Object :- To study the differential response of medium duration varieties to different spacings and levels of N.

1. BASAL CONDITIONS:
   (i) (a) Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.
   (iii) 10.6.1959/21 and 22.8.1959. (iv) (a) Cross discing by tractor and laddering. Final puddling was done by iron plough and laddering. (b) Transplanted after dry nursery. (c) 25 lb./ac. (d) As per treatment. (e) 2 to 3. (f) Nil. (g) As per treatments. (h) Interculture and weeding. (i) 49.5. (j) 4 to 16.12.1959.

2. TREATMENTS:

Main-plot treatments:
4 levels of N: N₀ = 0, N₁ = 30, N₂ = 60 and N₃ = 90 lb./ac.

Sub-plot treatments:
All combinations of (1) and (2)
   (i) 2 varieties: V₁ = T-141 and V₀ = F-1242.
   (ii) 4 spacings: S₁ = 3'×6', S₂ = 6'×6', S₃ = 9'×6' and S₄ = 12'×6'.

3. DESIGN:
   (i) Split-plot. (ii) 4 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 15'×15', (b) 13'×12'. (v) 1'×1.5'. (vi) Yes.

4. GENERAL:
   (i) Fairly good. (ii) Nil. (iii) Yield of grain, height measurement and tillers count. (iv) (a) 1959 to 1960. (b) No. (c) Nil. (d) (a) and (b) Nil. (vi) Heavy rain in Oct. (vii) Low yield due to untimely rainfall.

5. RESULTS:
   (i) 1816 lb./ac. (ii) (a) 449 lb./ac. (b) 347 lb./ac. (iii) Main effects of N and V and interaction N × V are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>Mean</th>
<th>V₁</th>
<th>V₀</th>
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<tbody>
<tr>
<td>N₀</td>
<td>1312</td>
<td>1097</td>
<td>1309</td>
<td>1183</td>
<td>1225</td>
<td>1395</td>
<td>1056</td>
</tr>
<tr>
<td>N₁</td>
<td>2403</td>
<td>2428</td>
<td>2359</td>
<td>2004</td>
<td>2298</td>
<td>2863</td>
<td>1734</td>
</tr>
<tr>
<td>N₂</td>
<td>2217</td>
<td>1955</td>
<td>2028</td>
<td>2141</td>
<td>2090</td>
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<td>N₃</td>
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<td>1714</td>
<td>1801</td>
<td>1795</td>
<td>1652</td>
<td>2103</td>
<td>1202</td>
</tr>
<tr>
<td>Mean</td>
<td>1813</td>
<td>1798</td>
<td>1874</td>
<td>1781</td>
<td>1816</td>
<td>2249</td>
<td>1384</td>
</tr>
<tr>
<td>V₁</td>
<td>2209</td>
<td>2182</td>
<td>2258</td>
<td>2247</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V₂</td>
<td>1417</td>
<td>1414</td>
<td>1391</td>
<td>1314</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
S.E. of difference of two

1. N marginal means = 129.6 lb./ac. 5. V means at the same level of N = 141.7 lb./ac.
2. S marginal means = 100.2 lb./ac. 6. N means at the same level of S = 216.6 lb./ac.
3. V marginal means = 70.8 lb./ac. 7. N means at the same level of V = 163.8 lb./ac.
4. S means at the same level of N = 200.3 lb./ac. 8. S means at the same level of V = 100.2 lb./ac.

Crop = Paddy (Kharif).

■ Site = Central Rice Res. Instt., Cuttack.

Ref = C.R.R.I. 59(3).

Type = ‘CMV’.

Object: To study the differential response of early duration varieties to different spacings and levels of N.

1. BASAL CONDITIONS:

(i) (a) Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Light clay loam. (b)Refer soil analysis, C.R.R.I.,

Cuttack. (iii) 2.7.1959/27 and 28.7.1959. (iv) (a) Tractor ploughing followed by bullock iron ploughing.

(b) Transplanted after dry nursery. (c) 25 lb./ae. (d) As per treatments. (e) 2 to 3. (v) Nil. (vi) As per
treatments. (vii) Irrigated. (viii) Inter;culture and weeding. (ix) 450°. (x) 26 and 27.10.1959.

2. TREATMENTS:

Main-plot treatments:

4 levels of N : N0 = 0, N1 = 30, N2 = 60 and N3 = 90 lb./ac.

Sah-plot treatments:

All combinations of (1) and (2)

(1) 2 varieties: V1 = PTB-10 and V2 = N-136.

(2) 4 spacings: S1 = 3”X6”, S2 = 6”X6H, S3 = 9”X6”

and S4 = 12”X6”.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plot/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 30’X15’.

(b) 27’X15’. (v) 1.5’X1’; (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Nil. (iii) Yield of grain, height measurement, tillers count and length of ear-heads. (iv) (a)

1959—1960. (b) Yes. (c) Nil: (v) to (vii) Nil.

5. RESULTS:

(i) 173.8 lb./ac. (ii) (a) 697 lb./ac. (b) 249 lb./ac. (iii) Main effects of V and S are highly significant. (iv)

Av. yield of grain in lb./ac.

\[
\begin{array}{cccc}
S_1 & S_2 & S_3 & S_4 \\
N_0 & 1608 & 1711 & 1708 & 1726 \\
N_1 & 1761 & 1945 & 1964 & 2044 \\
N_2 & 1527 & 2050 & 2106 & 1844 \\
N_3 & 1189 & 1375 & 1474 & 1751 \\
Mean & 1521 & 1771 & 1808 & 1851 \\
V_1 & 1934 & 2189 & 2184 & 2136 \\
V_2 & 1108 & 1553 & 1433 & 1566 \\
\end{array}
\]

S.E. of difference of two

1. N marginal means = 246.4 lb./ac. 5. V means at the same level of N = 124.5 lb./ac.
2. S marginal means = 88.0 lb./ac. 6. N means at the same level of S = 289.7 lb./ac.
3. V marginal means = 62.2 lb./ac. 7. N means at the same level of V = 261.7 lb./ac.
4. S means at the same level of N = 176.1 lb./ac. S.E. of body of S X V table = 88.0 lb./ac.
Object: To study the effect of dipping and spraying coppeasan against blast on Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil (b) Paddy (c) N.A. (ii) (a) Clay loam (b) Ref. soil analysis, C.R.R.I., Cuttack. (iii) 17.7.1954/17.8.1954. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9" x 6". (e) 2 to 3. (v) Nil (vi) CO - 13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 55.5°. (x) 13.11.1954.

2. TREATMENTS:

5 spraying treatments: T₀ = Control (No dipping and no spraying), T₁ = Dipping in coppeasan at the time of transplanting and spraying coppeasan 45, 60, 90 and 97 days after transplanting. T₂ = Dipping in coppeasan at the time of transplanting and spraying coppeasan 45 and 90 days after transplanting. T₃ = Dipping in coppeasan at the time of transplanting and spraying coppeasan 45 and 97 days after transplanting and T₄ = Spraying coppeasan 90 and 97 days after transplanting.

3. DESIGN:

(i) R.B.D. (ii) 5. (b) N.A. (iii) 8. (iv) (a) 29° x 9.75°. (b) 26.75° x 7.25°. (v) 2 rows around. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Blast attack. (iii) Yield of grain and straw, height and ear-length. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Yield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1175</td>
<td>1828</td>
<td>1468</td>
<td>1667</td>
<td>1424</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>65.5 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Incidence of neck infection

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>33.95</td>
<td>19.84</td>
<td>24.82</td>
<td>21.30</td>
<td>24.99</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.62 degrees.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean % of neck infection</td>
<td>32.07</td>
<td>12.25</td>
<td>18.50</td>
<td>13.54</td>
<td>18.46</td>
</tr>
</tbody>
</table>
3. DESIGN:
(i) R.B.D. (ii) (a) S. (b) N.A. (iii) 8. (iv) (a) 25'×9.75'. (b) 28'×8.25'. (v) 6'×9'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Incidence of blast. (iii) Neck infected tiller counts and yield of grain and straw. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Yield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>828</td>
<td>1050</td>
<td>1075</td>
<td>958</td>
<td>962</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>~40.4 lb./ac.</td>
<td></td>
<td></td>
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</table>

Incidence of neck infection

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>14.05</td>
<td>9.27</td>
<td>6.61</td>
<td>12.26</td>
<td>10.25</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>~0.74 degrees</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Mean % of neck infection: 6.01 2.23 1.50 4.57 3.27

Crop: Paddy (Kharif).

Site: Central Rice Res. Instt., Cuttack.

Type: 'D'.

Ref: C.R.R. 54(14).

Object: To study the effect of spraying copper against blast on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 3.7.1954/5.8.1954. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 5'×6'. (e) 2 to 3. (v) Nil. (vi) CO-13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 55.24'. (x) 28.10.1954.

2. TREATMENTS:
3 spraying treatments: $S_0$—Control, $S_1$=Low volume spraying of 0.5% copper at 20 gallons/ac. and $S_2$=Normal volume spraying of 0.5% copper at 100 gallons/ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 9. (iv) (a) 93'×11.5'. (b) 90'×10.5'. (v) 1.5'×0.5'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Incidence of blast. (iii) Neck infected tiller counts and grain yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Yield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1470</td>
<td>1821</td>
<td>1897</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>~41.8 lb./ac.</td>
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</tbody>
</table>
Incidence of neck infection

(i) 20.87 degrees. (ii) 7.77 degrees. (iii) Treatment differences are highly significant. (iv) Av. % of incidence of neck infection in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>32.39</td>
<td>18.45</td>
<td>11.78</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>2.59 degrees.</td>
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<td></td>
</tr>
<tr>
<td>Mean % of neck infection</td>
<td>29.60</td>
<td>11.18</td>
<td>4.34</td>
</tr>
</tbody>
</table>

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.

Object :-To study the effect of spraying coppesan against blast on Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 6.7.1955/10.8.1955. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9' x 6'. (e) 2 to 3. (v) Nil. (vi) CO—13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 72.71'. (x) 13.11.1955.

2. TREATMENTS:

3 spraying treatments : S₀ = Control, S₁ = Low volume spraying of 0.5 % coppesan at 20 gallons/ac. and S₂ = Normal volume spraying of 0.5 % coppesan at 100 gallons/ac.

3. DESIGN:

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 9. (iv) (a) 93' x 11.25'. (b) 1/46.22 lb./ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Incidence of blast. (iii) Neck infected tiller counts and grain yield. (iv) (a) 1954—cond. No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Yield

(i) 1040 lb./ac. (ii) 170.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>893</td>
<td>1135</td>
<td>1091</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>56.9 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Incidence of neck infection

(i) 20.14 degrees. (ii) 5.90 degrees. (iii) Treatment differences are highly significant. (iv) Av. % of incidence (b) of neck infection in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>26.95</td>
<td>17.43</td>
<td>14.03</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.97 degrees.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean % of neck infection</td>
<td>21.61</td>
<td>9.34</td>
<td>6.31</td>
</tr>
</tbody>
</table>

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.

Object :-To study the effect of spraying coppesan against blast on Paddy.

Ref :- C.R.R.I. 55(12).
Type :- 'D'.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 2.7.1956/6.8.1956. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9"x6". (e) 2 to 3. (v) Nil. (vi) CO—13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 82.75°. (x) 29.10.1956 and 2.11.1956.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 55(12) on page 86.

5. RESULTS:
   Yield
   (i) 1463 lb./ac. (ii) 74.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment  S₀  S₁  S₂  S₃  S₄
   Av. yield  1336 1418 1626
   S.E./mean = 24.7 lb./ac.

   Incidence of neck infection
   (i) 13.12 degrees. (ii) 2.13 degrees. (iii) Treatment differences are highly significant. (iv) Av. % of incidence of neck infection in degrees.
   Treatment  S₀  S₁  S₂  S₃  S₄
   Mean angle 18.43 11.37 9.35
   S.E./mean = 0.71 degrees.
   Mean % of neck infection 10.16 4.14 3.01

Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.
Type: D'.

Object: To study the effect of spraying copperas against blast on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 5.7.1957/13.8.1957. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9"x6". (e) 2 to 3. (v) Nil. (vi) CO—13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.47°. (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 55(12) on page 86.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 9. (iv) (a) 9'x11.25'. (b) 92'x9.75'. (v) 6"x9". (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Incidence of blast. (iii) Neck infected tillers and grain yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   Yield
   (i) 1542 lb./ac. (ii) 124.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment  S₀  S₁  S₂  S₃  S₄
   Av. yield  1344 1528 1755
   S.E./mean = 41.5 lb./ac.
Incidence of neck infection

(i) 13.60 degrees. (ii) 4.05 degrees. (iii) Treatment differences are significant. (iv) Av. % of incidence of neck infection in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>15.65</td>
<td>15.10</td>
<td>10.05</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.35 degrees</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mean % of neck infection 7.81 6.95 3.15

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.
Ref :- C.R.R.I. 58(7).
Type :- 'D'.

Object :- To study the effect of spraying agrochemicals against blast on Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 14.7.1958/11.8.1958. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9" x 6", (e) 2 to 3. (v) Nil. (vi) CO-13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 57.94°. (x) N.A.

2. TREATMENTS :
   Same as in expt. no. 55(12) on page 86.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 9. (iv) (a) 9' x 11.25'. (b) 9' x 9.75'. (v) 6' x 9'. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) Incidence of blast. (iii) Neck infected tillers and grain yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Yield

(i) 817 lb./ac. (ii) 117.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>584</td>
<td>822</td>
<td>1045</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>39.13 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Incidence of neck infection

(i) 24.59 degrees. (ii) 5.35 degrees. (iii) Treatment differences are highly significant. (iv) Av. % of incidence of neck infection in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>33.32</td>
<td>22.83</td>
<td>17.61</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.78 degrees</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mean % of neck infection 30.79 15.54 9.21

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.
Ref :- C.R.R.I. 54(16).
Type :- 'D'.

Object :- To study the effect of spraying herbicides and weeding against weeds on Paddy.
1. BASAL CONDITIONS:
(a) Nil. (b) Paddy. (c) N.A. (d) Clay loam. (e) Refer soil analysis, C.R.R.I., Cuttack. (f) Nil. 11.7.1954/N.A. (g) 4 ploughings, laddering and levelling. (h) Transplanting. (i) N.A. (j) 9'x10". (k) 2 to 3. (l) Nil. (m) T-141 (medium). (n) Irrigated. (o) As per treatments. (p) 55.24". (q) 9.12.1954.

2. TREATMENTS:
All combinations of (l) and (2)+1 extra treatment
(l') 2 levels of weeding: W₀=No hand weeding and W₁=Hand weeding.
(2') 5 herbicides: H₀=No herbicide, H₁=Chloroxone, H₂=Phenoxyline, H₃=2, 4-5-T and H₄=Kathone M₇.

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 318"x7.5". (b) 30'x6'. (v) 10'x9'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Height, tiller counts ear-length and grain yield. (iv) (a) 1951—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 3815 lb./ac. (ii) 138.9 lb./ac. (iii) All the effects are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>H₀</th>
<th>H₁</th>
<th>H₂</th>
<th>H₃</th>
<th>H₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>W₀</td>
<td>3831</td>
<td>4250</td>
<td>4586</td>
<td>4099</td>
<td>4274</td>
<td>4208</td>
</tr>
<tr>
<td>W₁</td>
<td>4288</td>
<td>3315</td>
<td>3439</td>
<td>2546</td>
<td>3187</td>
<td>3355</td>
</tr>
<tr>
<td>Mean</td>
<td>4060</td>
<td>3783</td>
<td>4013</td>
<td>3323</td>
<td>3731</td>
<td>3782</td>
</tr>
</tbody>
</table>

S.E. of H marginal mean = 49.1 lb./ac.
S.E. of W marginal mean = 31.1 lb./ac.
S.E. of body of table or T mean = 69.5 lb./ac.

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Inst., Cuttack.
Type :- 'D'.

Object :- To study the effect of spraying herbicides and weeding against weeds on Paddy.

1. BASAL CONDITIONS:
(a) Nil. (b) Paddy. (c) N.A. (d) Clay loam. (e) Refer soil analysis, C.R.R.I., Cuttack. (f) Nil. 11.7.1954/N.A. (g) 4 ploughings, laddering and levelling. (h) Transplanting. (i) N.A. (j) 9'x10". (k) 2 to 3. (l) Nil. (m) T-141 (medium). (n) Irrigated. (o) As per treatments. (p) 55.24". (q) 9.12.1954.

2. TREATMENTS:
12 weedicidal treatments: T₀=Control, T₁=Hand weeding, T₂=Japanese weeder, T₃=Chloroxone, T₄=Shell 2, 4-D, T₅=Fenoxone, T₆=Kathone M₇, T₇=Corox, T₈=2, 4, 5-T, T₉=Phenoxyline, T₁₀=M.C.P.A. and T₁₁=Agroxone.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 20'6"x10'10". (b) 18'x9'2". (v) 9'x10". (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Height, tiller counts ear-length and grain yield. (iv) (a) 1951—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.
5. RESULTS:

(ii) 2466 lb./ac. (ii) 235.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T9</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2017</td>
<td>2655</td>
<td>2717</td>
<td>2390</td>
<td>2421</td>
<td>2490</td>
<td>2364</td>
<td>2352</td>
<td>1999</td>
<td>2783</td>
<td>2537</td>
<td>2862</td>
</tr>
</tbody>
</table>

S.E./mean = 118.2 lb./ac.

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Crop: Paddy (Kharif).  
Site: Central Rice Res. Instt., Cuttack.  
Ref: C.R.R.I. 56(10).  
Type = 'D'.

Object: To study the effect of spraying herbicides and weeding against weeds on Paddy.

1. BASAL CONDITIONS:

(i) Nil. (b) Paddy. (c) N.A. (iii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 5.7.1956/10.8.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 10'x6'. (e) 2 to 3. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 82.7%.

2. TREATMENTS:

12 weedidal treatments: T0 = Control, T1 = Hand weeding, T2 = Japanese weeder. T3 = Phenoxylene-30, T4 = Agroxone-30, T5 = Chloroxone, T6 = Shell 2, 4-D, T7 = Fernoxone, T8 = Kethone M-7, T9 = Cornox and T10 = Ishihara 2, 4-D.

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 20.5'x10'. (b) 18.5'x9'. (v) 1'x10'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) N.A. (iii) Height, tiller counts ear-length and grain yield. (iv) (a) 1951—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(ii) 2385 lb./ac. (ii) 197.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T9</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2158</td>
<td>2643</td>
<td>2571</td>
<td>2949</td>
<td>2995</td>
<td>2217</td>
<td>2584</td>
<td>2453</td>
<td>2587</td>
<td>2394</td>
<td>2610</td>
<td>2761</td>
</tr>
</tbody>
</table>

S.E./mean = 98.9 lb./ac.

---

Crop: Paddy (Kharif).  
Site: Central Rice Res. Instt., Cuttack.  
Ref: C.R.R.I. 57(16).  
Type = 'D'.

Object: To study the effect of spraying herbicides and weeding against weeds on Paddy.

1. BASAL CONDITIONS:

(i) Nil. (b) Paddy. (c) N.A. (iii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 3.7.1957/12.8.1957. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9'x6'. (e) 2 to 3. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 29.47%. (x) 16 and 17.12.1957.

2. TREATMENTS:

Same as exp no. 56(10) above.

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 22.5'x20.5'. (b) 1(112.12 ac. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Good. (ii) N.A. (iii) Height, tiller counts ear-length and grain yield. (iv) (a) 1551—contd. (b) No. (c) Nil. (v) to (viii) Nil.

5. RESULTS:
(i) 3174 lb./ac. (ii) 445.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_0</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
<th>T_8</th>
<th>T_9</th>
<th>T_10</th>
<th>T_11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2886</td>
<td>3369</td>
<td>3212</td>
<td>3306</td>
<td>3252</td>
<td>2605</td>
<td>3013</td>
<td>2837</td>
<td>3143</td>
<td>3162</td>
<td>3103</td>
<td>2887</td>
</tr>
</tbody>
</table>

S.E./mean = 222.6 lb./ac.

Crop :- Paddy (Kharchi).
Site :- Central Rice Res. Inst., Cuttack.
Ref :- C.R.R.I. 58(3).
Type :- 'D'.

Object: — To study the effect of spraying herbicides and weeding against weeds on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (d) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 5.7.1958/6.8.1958. (iv) (a) 4 ploughings, ladder and levelling. (b) Transplanting. (c) N.A. (d) 10^6x,6'. (e) 2 to 3. (v) N.A. (vi) T—141 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 57.96'. (x) 8.12.1958.

2. TREATMENTS:
12 weedicidal treatments: T_0 = Control, T_1 = Hand weeding, T_2 = Japanese weeder, T_3 = Phenoxadine, T_4 = Aroclane, T_5 = Chloroxane, T_6 = Shell 2,4-D, T_7 = Katcon 2,4-D, T_8 = Komoxox. T_9 = Kishoxand T_11 = Ishihara 2,4-D.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 20.5'x10.63'. (v) 18.5'x11.7'. (v) 1'x0.83'. (vi) Yes.

4. GENERAL:
(i) Good. (b) N.A. (iii) Height, tiller counts ear-length and grain yield. (iv) (a) 1951—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2610 lb./ac. (ii) 2286 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_0</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
<th>T_8</th>
<th>T_9</th>
<th>T_10</th>
<th>T_11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2337</td>
<td>2805</td>
<td>2769</td>
<td>265</td>
<td>2500</td>
<td>2648</td>
<td>2769</td>
<td>2556</td>
<td>2517</td>
<td>2566</td>
<td>2533</td>
<td>2540</td>
</tr>
</tbody>
</table>

S.E. mean = 114.3 lb./ac.

Crop :- Paddy.
Site :- Central Rice Res. Inst., Cuttack.
Ref :- C.R.R.I. 59(32).
Type :- 'D'.

Object: — To study the effect of spraying herbicides and weeding against weeds on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) 0 lb./ac. of N as A/S + 30 lb./ac. of P_2O_5 as Super. (ii) (a) Light clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 26.6.1959/31.7.1958. (iv) 1 tractor ploughing, 2 ploughings by iron-plough and ladder. (b) Transplanting. (c) 25 lb./ac. (d) 5'x5.6'. (e) 2 to 3. (v) 40 lb./ac. of N as A/S. (vii) T—141 (150 days duration). (viii) Irrigated. (vii) As per treatments. (x) 49.35'. (x) 2.12.1959.
2. TREATMENTS:

12 weedicidal treatments: T0=Control, T1=Hand weeding, T2=Japanese weeder, T3=Phenoxy/ene—30, T4=Agroxone—3, T5=2, 4-D, T6=Chloroxone, T7=Peroxone, T8=Shell 2, T9=Kathone M—7, T10=Carnox and T11=Iso-carnox.

Herbicides sprayed 6 weeks after planting at 2 lb./ac. in 100 gallons of water.

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 21'×15'. (b) 19.5'×15'. (v) 9'×12'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Height, tiller counts and grain yield. (iv) (a) 1951—contd (with modifications). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 3048 lb./ac. (ii) 121.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2924</td>
<td>2919</td>
<td>3217</td>
<td>3051</td>
<td>3009</td>
<td>2851</td>
<td>3062</td>
<td>3280</td>
<td>3259</td>
<td>2766</td>
<td>3089</td>
<td>3126</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>60.5 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharij).
Site: Central Rice Res. Instt., Cuttack.
Type: ‘D’.

Object: To find out the suitable fungicide for control of blast on Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I. Cuttack. (iii) 2.7.1956/9.8.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) CO—13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 82.73'. (x) 22 and 23.11.1956.

2. TREATMENTS:

4 spraying treatments: S0=Control (no spraying), S1=Agrosan dust, S2=Ceresan dust and S3=Bordeaux mixture 5 : 5 : 50.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 128'×14.25'. (b) 123.5'×10.5'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Dusting against blast disease was done. (iii) Neck infected tiller counts and grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Yield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1209</td>
<td>1454</td>
<td>1313</td>
<td>1327</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>32.15 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Incidence of blast

(i) 7.83 degrees. (ii) 2.94 degrees. (iii) Treatment differences are not significant. (iv) Av. % of incidence of infection in degrees.
Treatment  S_0  S_1  S_2  S_3  S_4  S_5  S_6  S_7  S_8  S_9
Mean angle  8.53  7.52  6.21  9.08
S.E./mean = 1.20 degrees.

Mean % of infection  2.35  1.76  1.29  1.67

Crop: Paddy (Kharif).  
Site: Central Rice Res. Instt., Cuttack.  
Object: To find out the suitable fungicide for control of blast.

Ref: C.R.R.I. 57(14).  
Type: 'D'.

### 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A.  
(ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.  
(iii) N.A./4.4.1957.  
(iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A.  
(d) 9' x 6'.  
(e) 2 to 3.  
(f) Nil. (g) CO-13 (early). (h) Irrigated. (i) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (j) 29.47'.

### 2. TREATMENTS:

Same as in exp. no. 56(15) on page 92.

### 3. DESIGN:

(i) R.R.D.  
(ii) (a) 4. (b) N.A.  
(iii) 4.  
(iv) (a) 128' x 30'. (b) 128' x 15'. (c) 1' x 7.5'.  
(v) Yes.

### 4. GENERAL:

(i) Satisfactory.  
(ii) Attack of blast. (iii) Neck infected tillers and grain yield.  
(iv) (a) 1956 - contd. (b) Nil.  
(v) to (viii) Nil.

### 5. RESULTS:

**Yield**

(i) 1103 lb./ac.  
(ii) 163.2 lb./ac.  
(iii) Treatment differences are highly significant.  
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S_0</th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
<th>S_5</th>
<th>S_6</th>
<th>S_7</th>
<th>S_8</th>
<th>S_9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>862</td>
<td>1425</td>
<td>1237</td>
<td>889</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>81.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Incidence of blast**

(i) 4.94 degrees.  
(ii) 1.30 degrees. (iii) Treatment differences are highly significant.  
(iv) Av. % of incidence of infection in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S_0</th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
<th>S_5</th>
<th>S_6</th>
<th>S_7</th>
<th>S_8</th>
<th>S_9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>8.96</td>
<td>2.81</td>
<td>2.58</td>
<td>5.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.65 degrees.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Mean % of infection | 2.68 | 0.39 | 0.28 | 0.97 |

Crop: Paddy (Kharif).  
Site: Central Rice Res. Instt., Cuttack.  
Object: To find out the suitable fungicide for control of blast.

Ref: C.R.R.I. 58(5).  
Type: 'D'.

Object: To find out the suitable fungicide for control of blast.
1. BASEL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A./19.8.1958. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9'×6'. (e) 2 to 3. (v) Nil. (vi) CO—13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 57.94°. (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 56(15) on page 92.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 128'×30'. (b) 126'×15'. (v) 1'×7.5'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Attack of blast. (iii) Neck infected tiller counts and grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS

   Yield
   (i) 783 lb./ac. (ii) 173.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>511</td>
<td>753</td>
<td>993</td>
<td>834</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>86.7 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Incidence of blast
   (i) 12.60 degrees. (ii) 3.22 degrees. (iii) Treatment differences are significant. (iv) Av. % of incidence of infection in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>18.25</td>
<td>11.18</td>
<td>10.93</td>
<td>10.04</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.61 degrees</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Mean % of infection 10.00 3.98 3.85 3.25

6. Crop :- Paddy (Kharif).
   Site :- Central Rice Res. Instt., Cuttack.

Object :- To find out the suitable fungicide for control of blast.

1. BASEL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) G.M.+A/S. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 7.7.1959 to 22.8.1959. (iv) (a) 1 summer ploughing, laddering and levelling. (b) Transplanting. (c) 25 lb./ac. (d) 6'×9'. (e) 1 to 2. (v) G.M. (dhaincha) + A/S at 40 lb./ac. of N. (vi) CO—13. (vii) Irrigated. (viii) Hand weeding. (ix) to (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 56(15) on page 92.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 123'×30'. (b) 127'×28'. (v) 6'×9'. (vi) Yes.

4. GENERAL:
   (i) Good. Lodging affected the crop. (ii) Attack of blast. (iii) Neck infected tillers and grain yield. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS

   Yield
   (i) 764 lb./ac. (ii) 80.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
Crop = Paddy (Kharif),
Site = Central Rice Research Inst., Cuttack.
Type = 'D'.

Object: To find out the best fungicide for control of blast.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (i) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 17.7.1954/19.8.1954. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9" x 6". (e) 2 to 3. (v) Nil. (vi) CO-13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 55.24". (x) 15.11.1954

2. TREATMENTS:
   5 spraying treatments: S0 = Control (no spraying), S1 = Bordeaux mixture, S2 = Perenox 0.5%, S3 = Coppesan 0.5% and S4 = Cupravit 0.5%.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 8. (iv) (a) 29' x 9'. (b) 28' x 7.5'. (v) 1 row around. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Attack of blast. (iii) Neck infected tiller counts and grain yield. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Yield
   (i) 1272 lb./ac. (ii) 222.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of gram in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>933</td>
<td>1474</td>
<td>1348</td>
<td>1206</td>
<td>1598</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>78.49 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Incidence of blast
   (i) 21.15 degrees. (ii) 3.37 degrees. (iii) Treatment differences are highly significant. (iv) Av. % of incidence of infection in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>32.91</td>
<td>17.15</td>
<td>19.18</td>
<td>20.88</td>
<td>15.63</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.19 degrees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Mean % of infection | 29.64 | 9.07 | 11.71 | 13.10 | 7.75 |
Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.

Object: To find out the best fungicide for control of blast.

1. BASEL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 1955.
   (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9" x 6". (e) 2 to 3. (v) Nil. (vi) CO-13. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 2.7.1956/8.8.1956.

2. TREATMENTS:
   5 spraying treatments: S0 = Control (no spraying), S1 = Bordeaux mixture 5 : 5 : 50, S2 = Shell copper fungicide, S3 = Fungemar and S4 = Agrosan dust.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 8. (iv) (a) 29' x 9.75'. (b) 27' x 8.25'. (v) 6' x 9'. (vi) Yes.

GENERAL:
   (i) Satisfactory. (ii) Spraying was done against blast. (iii) Neck infected tiller counts and yield of grain. (iv) (a) 1955—contd. (q) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

   Yield
   (i) 1128 lb./ac. (ii) 123.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment: S0 S1 S2 S3 S4
   Av. yield: 968 1163 1229 1210 1068
   S.E./mean = 43.64 lb./ac.

   Incidence of blast
   (i) 11.47 degrees. (ii) 2.85 degrees. (iii) Treatment differences are highly significant. (iv) Av. % incidence of infection in degrees.
   Treatment: S0 S1 S2 S3 S4
   Mean angle: 14.47 9.92 9.44 10.43 13.08
   S.E./mean = 1.01 degrees.
   % of infection: 6.67 3.31 3.07 3.56 5.27
4. GENERAL:
(i) Satisfactory. (ii) Spraying of fungicides against incidence of disease. (iii) Neck infected tiller counts and grain yield. (iv) (a) 1953 – contd. (b) Nil. (v) to (vii) Nil.

5. RESULTS:

Yield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>920</td>
<td>1201</td>
<td>1222</td>
<td>1271</td>
<td>988</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>53.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Incidence of blast

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>15.84</td>
<td>10.19</td>
<td>7.26</td>
<td>12.49</td>
<td>15.63</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.59 degrees.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean % of infection</td>
<td>8.73</td>
<td>3.43</td>
<td>2.33</td>
<td>5.42</td>
<td>8.30</td>
</tr>
</tbody>
</table>

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.
Type :- ‘D’.

Object :- To find out the best fungicide for control of blast on Paddy.

1. BASAL CONDITIONS:
(i) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) N.A./8.8.1957. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9' × 6'. (e) 2 to 3. (f) Nil. (g) CO=13 (early). (h) Irrigated, (vii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 29.47". (x) N.A.

2. TREATMENTS:
5 spraying treatments: S₀=Control (no spraying), S₁=Ceresan at 1 lb./ac. in 100 gallons, S₂=Ferdide at 5 lb./ac. in 100 gallons, S₃=Aretan 6% at 3.25 lb./ac. in 100 gallons and S₄=Mema at 1.3 lb./ac. in 100 gallons.

3. DESIGN and 4. GENERAL:
Same as in expt. no. 55(8) on page 96.

5. RESULTS:

Yield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>902</td>
<td>1162</td>
<td>917</td>
<td>1236</td>
<td>1262</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>38.5 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Incidence of blast

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>15.84</td>
<td>10.19</td>
<td>7.26</td>
<td>12.49</td>
<td>15.63</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.59 degrees.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean % of infection</td>
<td>8.73</td>
<td>3.43</td>
<td>2.33</td>
<td>5.42</td>
<td>8.30</td>
</tr>
<tr>
<td>Treatment</td>
<td>$S_0$</td>
<td>$S_1$</td>
<td>$S_2$</td>
<td>$S_3$</td>
<td>$S_4$</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Mean angle</td>
<td>5.95</td>
<td>4.82</td>
<td>2.77</td>
<td>4.69</td>
<td>4.93</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.88</td>
</tr>
<tr>
<td>Mean % of infection</td>
<td>1.18</td>
<td>0.96</td>
<td>0.38</td>
<td>1.00</td>
<td>0.98</td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).  
Site: Central Rice Res. Instt., Cuttack.  
Object: To find out the best fungicide for control of blast on Paddy.

1. BASAL CONDITIONS:
- (i) (a) Nil. (b) Paddy. (c) N.A.  
- (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.  
- (iii) 15.7.1959/12.8.1958.  
- (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9" x 6".  
- (e) 2 to 3. (v) Nil. (vi) CO—13 (early). (vii) Weeding. (viii) 2 to 3 intercultures with Japanese weed. (ix) 57.94°. (x) N.A.

2. TREATMENTS:
- 5 spraying treatments: $S_0$=Control (no spraying), $S_1$=Coppesan wet at 1 lb/ac. in 100 gallons, $S_2$=Fernite, $S_3$=Aretan 6% at 3.25 lb/ac. in 100 gallons and $S_4$=Meta at 1.30 lb/ac. in 100 gallons.

3. DESIGN and 4. GENERAL:
- Same as in exp. no. 53(8) on page 96.

5. RESULTS:

### Yield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>448</td>
<td>764</td>
<td>640</td>
<td>1189</td>
<td>929</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38.7 lb/ac.</td>
</tr>
</tbody>
</table>

### Incidence of blast

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>21.54</td>
<td>12.97</td>
<td>17.26</td>
<td>12.49</td>
<td>14.82</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.67 degrees</td>
</tr>
<tr>
<td>Mean % of infection</td>
<td>15.56</td>
<td>5.09</td>
<td>8.90</td>
<td>4.80</td>
<td>6.68</td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).  
Site: Central Rice Res. Instt., Cuttack.  
Object: To find out the best fungicide for control of blast on Paddy.

1. BASAL CONDITIONS:
- (i) (a) Nil. (b) Paddy. (c) N.A.  
- (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.  
- (iii) 7.7.1959/3 and 4.8.1959.  
- (iv) (a) 2 summer ploughings, laddering and levelling. (b) Transplanting. (c) 25 lb/ac. (d) 9" x 6". (e) 1 to 2. (v) 60 lb/ac. of N. (vi) CO—13 (early). (vii) Weeding. (ix) 45.05°. (x) 23.11.1959.
2. TREATMENTS:

5 spraying treatments: S₀ = Control, S₁ = Ceresan at 7.8 lb. in 100 gallons of water, S₂ = Fenide at 5 lb. in 100 gallons of water, S₃ = Acretan 6% at 3.25 lb. in 100 gallons of water and S₄ = Merna at 1.30 lb. in 100 gallons of water. About 46 litres/ac. of these water solutions were sprayed.

3. DESIGN and 4. GENERAL:

Same as in expt. no. 55(8) on page 96.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1462</td>
<td>1500</td>
<td>1545</td>
<td>1593</td>
<td>1666</td>
</tr>
<tr>
<td>S.E.(mean)</td>
<td>61.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Incidence of blast

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
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<tr>
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<td>2.70</td>
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Crop: Paddy (Kharij).

Site: Central Rice Res. Inst., Cuttack.

Ref: C.R.R.I. 55(13).

Type: 'DY'.
Crop: Paddy (Kharif).

Site: Central Rice Res. Instt., Cuttack.

Object: To study the effect of spraying copper fungicides on foliage of different varieties of Paddy in controlling the blast disease.

1. BASEL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 28.6.1956/31.7.1956. (iv) (a) Ploughed and puddled by tractor. (b) Transplanted. (c) 25 lb./ac. (d) 6' x 9'. (e) 1 to 2. (v) Dhanicha as G.M. (vi) As per treatments. (vii) Irrigated. (viii) Hand weeding. (ix) N.A. (x) 8.11.1956 to 20.12.1956.

2. TREATMENTS:
   Same as in exp. no. 55(11) on page 99.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 16 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 8.25' x 7.5'. (b) 7.25' x 6'. (v) One row around. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Incidence of copper in July. (iv) (a) 1953 to 1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2055 lb./ac. (ii) (a) 854 lb./ac. (b) 1316 lb./ac. (iii) V effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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S.E. of difference of two means:
1. S marginal means
   - 75.2 lb./ac.
2. V marginal means
   - 140.8 lb./ac.
3. V means at the same level of S
   - 244.0 lb./ac.
4. S means at the same level of V
   - 247.8 lb./ac.

Ref: C.R.R.I. 56(24).
Type: 'DV'.
Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.
Ref.: C.R.R.I. 57(17). Type: 'DV'.

Object: To study the effect of spraying of copper fungicide against blast disease on different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 26.6.1957/9.8.1957. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9'x6'. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Nil. (viii) 2 to 3 intercultures with Japanese weeder and hand weeding. (ix) 29.47'. (x) 11.12.1957.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 53(13) on page 99.

4. GENERAL:
   (i) Satisfactory. (ii) Blast incidence was controlled by spraying of copper fungicides. (iii) Grain and straw yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1231 lb./ac. (ii) (a) 579.7 lb./ac. (b) 456.7 lb./ac. (iii) V effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th></th>
<th>V₁</th>
<th>V₃</th>
<th>V₅</th>
<th>V₇</th>
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Crop :- Paddy (Kharif).
Site :- Central Rice Res. Inst., Cuttack.
Ref :- C.R.R.I. 58(8).
Type :- 'DV'.

Object :- To study the effect of spraying of copper fungicide against blast disease on different varieties of Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 5.7.1958/13.8.1958. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9"×6"
   (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weed and 1 hand weeding. (ix) 57.94'. (x) 3.12.1958 and 10.12.1958.

2. TREATMENTS and DESIGN :
   Same as in exp. no. 55(13) on page 99.

4. GENERAL :
   (i) Satisfactory. (ii) Control measure was taken against blast incidence by spraying copper fungicide. (iii) Yield of grain, straw, height and neck infected tiller counts. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
   (i) 1022 lb./ac. (ii) (a) 511.0 lb./ac. (b) 408.0 lb./ac. (iii) V effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th>V3</th>
<th>V4</th>
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</table>

S.E. of difference of two
   1. S marginal means = 90.3 lb./ac.
   2. V marginal means = 166.6 lb./ac.
   3. V means at the same level of S = 289.5 lb./ac.
   4. S means at the same level of V = 293.6 lb./ac.
Object:—To study the effect of spraying of copper fungicide against blast disease on different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) Nil. (b) Paddy. (c) Nil. (d) Clay loam. (e) Ref: C.R.R.I. 59(25).
   (f) Soil analysis, C.R.R.I., Cuttack.
   (ii) 2 ploughings and 1 discing by tractor, laddering and levelling.
   (g) Transplanting. (h) 25 lb/ac. (d) 6"x9", (e) 1 to 2. (v) 1000 lb/ac. as G.M. from G. radicium aculatia and 60 lb/ac. of N as A/S in two doses. (vi) As per treatments. (vii) Irrigated. (viii) Hand weeding. (ix) 45.35°. (x) 12.12.1959.

2. TREATMENTS:
   Main-plot treatments: T0=Control (water spray), T1=0.5% copper fungicide at 20 gallons/ac. and T2=0.5% copper fungicide at 100 gallons/ac.
   Sub-plot treatments:

3. DESIGN:
   (i) Split-plot. (ii) 3 main-plots per replication; 15 sub-plots/main-plot. (iii) 4. (iv) 8.25' x 7.5'. (v) 1 row around. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Incidence of copper in July. (iv) (a) 1953-1959. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2139 lb/ac. (ii) (a) 203.4 lb/ac. (b) 313.2 lb/ac. (iii) Main effects of T and V are highly significant. (iv) Av. yield of grain in lb/ac.

<table>
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<tr>
<th>T</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
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S.E. of difference of two
1. T marginal means = 31.1 lb/ac.
2. V marginal means = 279 lb/ac.
3. V means at the same level of T = 221.5 lb/ac.
4. T means at the same level of V = 217.2 lb/ac.

Object:—To study the effect of spraying of copper fungicide against blast disease on different varieties of Paddy.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Nil. (d) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (i) 12.7.1956/7.8.1956 and 8.11.1956. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 82.74°. (x) 12.11.1956 to 22.1.1957.

2. TREATMENTS:
All combinations of (1) and (2)
(i) 2 early varieties: V₁ =CO-13 and V₂ =T-6552.
or
(1) 2 medium varieties: V₁ =1145 and V₂ =Sm-8.
or
(1) 2 late varieties: V₁ =AKP-9 and V₂ =ASD-5.
(ii) 4 spraying treatments: T₀ =No dipping or spraying. T₁ =Dipping in coppesan solution at transplanting and spraying coppesan 45, 60, 90 and 97 days after transplanting. T₂ =Dipping in coppesan solution at transplanting and spraying coppesan 45 and 60 days after transplanting. T₃ =No dipping but spraying coppesan 50 and 97 days after transplanting.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 21'×12.75°. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Disease incidence present. Spraying was done to control the disease. (iii) Yield of grain and straw, height, ear-length and neck infection. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Infection in late varieties is N.A.

5. RESULTS:

### Early varieties yield

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S.E. of V marginal mean = 35.7 lb./ac.
S.E. of T marginal mean = 50.3 lb./ac.
S.E. of body of table = 71.4 lb./ac.

### Incidence of blast in early varieties

(i) 5.60 degrees. (ii) 3.80 degrees. (iii) Main effect of V alone is significant. (iv) Av. % of incidence of neck infection in degrees.

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<th>T₂</th>
<th>T₃</th>
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<td>3.32</td>
<td>8.31</td>
<td>5.80</td>
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S.E. of V marginal mean = 0.95 degrees.
S.E. of T marginal mean = 1.13 degrees.
S.E. of body of table = 1.90 degrees.
Medium varieties yield

(i) 1608 lb./ac.  (ii) 194.6 lb./ac.  (iii) Main effect of V alone is significant.  (iv) Av. yield of grain in lb./ac.

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<th>T₂</th>
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S.E. of V marginal mean = 48.7 lb./ac.
S.E. of T marginal mean = 68.8 lb./ac.
S.E. of body of table = 97.3 lb./ac.

Incidence of blast in medium varieties

(i) 9.69 degrees.  (ii) 3.22 degrees.  (iii) None of the effects is significant.  (iv) Av. % of incidence of necrotic infection in degrees.

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<tr>
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<td>10.34</td>
<td>9.08</td>
<td>7.41</td>
<td>7.75</td>
<td>8.65</td>
</tr>
<tr>
<td>V₂</td>
<td>10.66</td>
<td>12.08</td>
<td>10.79</td>
<td>9.40</td>
<td>10.73</td>
</tr>
<tr>
<td>Mean</td>
<td>10.50</td>
<td>10.18</td>
<td>9.10</td>
<td>8.58</td>
<td>9.69</td>
</tr>
</tbody>
</table>

S.E. of V marginal mean = 0.81 degrees.
S.E. of T marginal mean = 1.14 degrees.
S.E. of body of table = 1.61 degrees

Late varieties yield

(i) 1794 lb./ac.  (ii) 148.0 lb./ac.  (iii) Main effect of V alone is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>1595</td>
<td>1617</td>
<td>1739</td>
<td>1525</td>
<td>1619</td>
</tr>
<tr>
<td>V₂</td>
<td>1902</td>
<td>2034</td>
<td>1993</td>
<td>1881</td>
<td>1968</td>
</tr>
<tr>
<td>Mean</td>
<td>1779</td>
<td>1826</td>
<td>1866</td>
<td>1703</td>
<td>1794</td>
</tr>
</tbody>
</table>

S.E. of V marginal mean = 37.0 lb./ac.
S.E. of T marginal mean = 22.3 lb./ac.
S.E. of body of table = 74.0 lb./ac.

Crop: Paddy (Kharif).

Site: Central Rice Res. Inst., Cuttack.

Type: 'DV'.

Object: To study the effect of spraying of copper formulation against blast disease on different varieties of Paddy.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis. C.R.R.I., Cuttack. (iii) N.A./10 to 12.8.1957. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) N.A. (d) 9' x 6'. (e) 2 to 3. (f) Nil. (g) As per treatments. (h) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (i) 29.47'. (j) N.A.
2. TREATMENTS:

Main-plot treatments:
- 2 early varieties: \( V_1 = C0 - 13 \) and \( V_2 = T - 6552 \).
  or
- 2 medium varieties: \( V_1 = T - 1145 \) and \( V_1 = Sm - 8 \).
  or
- 2 late varieties: \( V_1 = AKP - 9 \) and \( V_2 = ASD - 5 \).

Sub-plot treatments:
- 4 spraying treatments:
  - \( T_0 \): No dipping or spraying.
  - \( T_1 \): Dipping in coppesan solution at transplanting and spraying coppesan 45, 60, 90 and 97 days after transplanting.
  - \( T_2 \): Dipping in coppesan solution at transplanting and spraying coppesan 45 and 60 days after transplanting.
  - \( T_3 \): No dipping but spraying coppesan 90 and 97 days after transplanting.

3. DESIGN:

(i) Split-plot. (ii) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/162.69 ac. (b) 1/206.32 ac for late and medium varieties and 1/210.43 for early varieties. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Disease incidence in all varieties except late duration varieties. Spraying with coppesan.
(iii) Neck infected tillers and grain yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) There was no infection in late varieties.

5. RESULTS:

Early varieties yield

- Yield: (i) 1422 lb/ac. (ii) (a) 84.1 lb/ac. (b) 133.0 lb/ac. (iii) V effect is highly significant. Interaction \( T \times V \) is significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>657</td>
<td>960</td>
<td>945</td>
<td>1025</td>
<td>907</td>
</tr>
<tr>
<td>( V_2 )</td>
<td>1986</td>
<td>1986</td>
<td>1801</td>
<td>1974</td>
<td>1937</td>
</tr>
<tr>
<td>Mean</td>
<td>1342</td>
<td>1473</td>
<td>1373</td>
<td>1500</td>
<td>1422</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. \( V \) marginal means = 29.8 lb/ac.
2. \( T \) marginal means = 66.5 lb/ac.
3. \( T \) means at the same level of \( V \) = 94.0 lb/ac.
4. \( V \) means at the same level of \( T \) = 86.7 lb/ac.

Incidence of blast in early varieties

(i) 4.51 degrees. (ii) (a) 0.66 degrees. (b) 1.13 degrees. (iii) Main effects of \( V \) and \( T \) are highly significant.

<table>
<thead>
<tr>
<th></th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>9.45</td>
<td>2.87</td>
<td>8.07</td>
<td>4.51</td>
<td>6.23</td>
</tr>
<tr>
<td>( V_2 )</td>
<td>4.95</td>
<td>0.54</td>
<td>4.68</td>
<td>1.03</td>
<td>2.80</td>
</tr>
<tr>
<td>Mean</td>
<td>7.20</td>
<td>1.71</td>
<td>6.37</td>
<td>2.77</td>
<td>4.51</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. \( V \) marginal means = 0.23 degrees.
2. \( T \) marginal means = 0.56 degrees.
3. \( T \) means at the same level of \( V \) = 0.80 degrees.
4. \( V \) means at the same level of \( T \) = 0.73 degrees.
Medium varieties yield

(i) 1046 lb./ac.  (ii) (a) 660.0 lb./ac.  (b) 332.6 lb./ac.  (iii) V effect alone is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>1756</td>
<td>1492</td>
<td>1386</td>
<td>1585</td>
<td>1555</td>
</tr>
<tr>
<td>V₂</td>
<td>380</td>
<td>543</td>
<td>607</td>
<td>617</td>
<td>537</td>
</tr>
</tbody>
</table>

Mean | 1046 | 1018 | 995  | 1101 | 1046 |

S.E. of difference of two

1. V marginal means = 233.4 lb./ac.
2. T marginal means = 166.3 lb./ac.
3. T means at the same level of V = 235.1 lb./ac.
4. V means at the same level of T = 309.7 lb./ac.

Incidence of blast in medium varieties

(i) 3.75 degrees.  (ii) (a) 1.62 degrees.  (b) 1.76 degrees.  (iii) T effect alone is highly significant.  (iv) Av. % of incidence of neck infection in degrees.

<table>
<thead>
<tr>
<th></th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>8.81</td>
<td>4.22</td>
<td>7.22</td>
<td>4.94</td>
<td>6.47</td>
</tr>
<tr>
<td>V₂</td>
<td>7.36</td>
<td>2.47</td>
<td>6.22</td>
<td>3.72</td>
<td>5.02</td>
</tr>
</tbody>
</table>

Mean | 8.08 | 3.33 | 7.22 | 4.33 | 5.75 |

S.E. of difference of two

1. V marginal means = 0.57 degrees.
2. T marginal means = 0.88 degrees.
3. T means at the same level of V = 1.24 degrees.
4. V means at the same level of T = 1.22 degrees.

Late varieties yield

(i) 3431 lb./ac.  (ii) (a) 718.6 lb./ac.  (b) 483.1 lb./ac.  (iii) V effect is highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>2841</td>
<td>2571</td>
<td>2148</td>
<td>2678</td>
<td>2570</td>
</tr>
<tr>
<td>V₂</td>
<td>4333</td>
<td>4630</td>
<td>3860</td>
<td>4310</td>
<td>4303</td>
</tr>
</tbody>
</table>

Mean | 3587 | 3600 | 3004 | 3534 | 3431 |

S.E. of difference of two

1. V marginal means = 254.1 lb./ac.
2. T marginal means = 241.6 lb./ac.
3. T means at the same level of V = 241.6 lb./ac.
4. V means at the same level of T = 389.8 lb./ac.

Crop -> Paddy (Kharif).

Site -> Central Rice Res. Instt., Cuttack.

Object -> To study the effect of spraying of copper sulphate against blast disease on different varieties of Paddy.

Ref -> C.R.R.I. 58(9).
Type -> 'DV'.
1. BASAL CONDITIONS:
- (i) Nil. (ii) Paddy. (iii) Clay loam. (iv) 4 ploughings, laddering and levelling. (v) N.A. (d) 9"x6". (e) 2 to 3. (vii) N.A. (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding. (ix) 57.94'. (x) 13.12.1958 to 5.1.1959.

2. TREATMENTS:
Same as in expt. no. 57(12) on page 105.

3. DESIGN:
- (i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4 for early and late varieties and 3 for medium. (iv) (a) 1/162.69 ac. (b) 1/210.43 ac. (v) N.A. (vi) Yes.

4. GENERAL:
Same as in expt. no. 57(12) on page 105.

5. RESULTS:
Early varieties yield
<table>
<thead>
<tr>
<th></th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_1</td>
<td>679</td>
<td>437</td>
<td>493</td>
<td>153</td>
<td>449</td>
</tr>
<tr>
<td>V_2</td>
<td>1594</td>
<td>1720</td>
<td>1646</td>
<td>1485</td>
<td>1711</td>
</tr>
<tr>
<td>Mean</td>
<td>1336</td>
<td>1078</td>
<td>1070</td>
<td>819</td>
<td>1076</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
- 1. V marginal means = 55.1 lb./ac.
- 2. T marginal means = 106.3 lb./ac.
- 3. T means at the same level of V = 150.4 lb./ac.
- 4. V means at the same level of T = 141.4 lb./ac.

Incidence of blast in early varieties
(i) 27.06 degrees. (ii) (a) 29.86 degrees. (iii) Main effect of T alone is highly significant. (iv) Av. % of incidence of neck infection in degrees,
<table>
<thead>
<tr>
<th></th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_1</td>
<td>61.11</td>
<td>29.93</td>
<td>46.92</td>
<td>35.64</td>
<td>41.40</td>
</tr>
<tr>
<td>V_2</td>
<td>14.37</td>
<td>7.23</td>
<td>11.48</td>
<td>9.78</td>
<td>10.71</td>
</tr>
<tr>
<td>Mean</td>
<td>37.74</td>
<td>18.58</td>
<td>29.20</td>
<td>22.71</td>
<td>27.06</td>
</tr>
</tbody>
</table>

S.E. of difference of two
- 2. T marginal means = 4.51 degrees.
- 3. T means at the same level of V = 6.38 degrees.
- 4. V means at the same level of T = 11.92 degrees.

Medium varieties yield
(i) 1971 lb./ac. (ii) (a) 471.5 lb./ac. (b) 301.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th></th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_1$</td>
<td>2183</td>
<td>2063</td>
<td>1773</td>
<td>1837</td>
<td>1969</td>
</tr>
<tr>
<td>$V_2$</td>
<td>2225</td>
<td>1883</td>
<td>1890</td>
<td>1866</td>
<td>1973</td>
</tr>
<tr>
<td>Mean</td>
<td>2204</td>
<td>1973</td>
<td>1832</td>
<td>1876</td>
<td>1971</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. $V$ marginal means = 1.67 lb./ac.
2. $T$ marginal means = 150.6 lb./ac.
3. $T$ means at the same level of $V$ = 213.0 lb./ac.
4. $V$ means at the same level of $T$ = 248.6 lb./ac.

Incidence of blast in medium varieties
(i) 23.46 degrees. (ii) (a) 8.62 degrees. (b) 4.12 degrees. (iii) $T$ effect alone is significant. (iv) Av. % of incidence of neck infection in degrees.

<table>
<thead>
<tr>
<th></th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_1$</td>
<td>29.26</td>
<td>19.59</td>
<td>21.86</td>
<td>20.26</td>
<td>23.52</td>
</tr>
<tr>
<td>$V_2$</td>
<td>27.03</td>
<td>20.74</td>
<td>21.72</td>
<td>21.14</td>
<td>23.41</td>
</tr>
<tr>
<td>Mean</td>
<td>28.64</td>
<td>19.97</td>
<td>22.54</td>
<td>21.70</td>
<td>23.46</td>
</tr>
</tbody>
</table>

S.E. of difference of two
2. $T$ marginal means = 2.38 degrees.
3. $T$ means at the same level of $V$ = 3.36 degrees.
4. $V$ means at the same level of $T$ = 4.57 degrees.

Late varieties yield
(i) 1707 lb./ac. (ii) (a) 249.0 lb./ac. (b) 183.2 lb./ac. (iii) None of the effects is significant. (iv) Avg. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_1$</td>
<td>1680</td>
<td>1756</td>
<td>1646</td>
<td>1677</td>
<td>1690</td>
</tr>
<tr>
<td>$V_2$</td>
<td>1729</td>
<td>1820</td>
<td>1621</td>
<td>1728</td>
<td>1725</td>
</tr>
<tr>
<td>Mean</td>
<td>1704</td>
<td>1788</td>
<td>1634</td>
<td>1702</td>
<td>1707</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. $V$ marginal means = 88.1 lb./ac.
2. $T$ marginal means = 91.6 lb./ac.
3. $T$ means at the same level of $V$ = 129.5 lb./ac.
4. $V$ means at the same level of $T$ = 142.6 lb./ac.

Incidence of blast in late varieties
(i) 25.29 degrees. (ii) (a) 9.56 degrees. (b) 3.58 degrees. (iii) $V$ effect alone is highly significant. (iv) Avg. % of incidence of neck infection in degrees.

<table>
<thead>
<tr>
<th></th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_1$</td>
<td>13.65</td>
<td>10.64</td>
<td>11.83</td>
<td>12.14</td>
<td>12.06</td>
</tr>
<tr>
<td>$V_2$</td>
<td>41.70</td>
<td>35.30</td>
<td>37.99</td>
<td>39.05</td>
<td>38.52</td>
</tr>
<tr>
<td>Mean</td>
<td>27.68</td>
<td>22.97</td>
<td>24.91</td>
<td>25.59</td>
<td>25.29</td>
</tr>
</tbody>
</table>
Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.

Ref :- C.R.R.I. 59(28).
Type :- 'DV'.

Object :- To study the effect of spraying of copeosal against blast on early varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) 60 to 80 lb./ac. of N in two doses as A/S. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 2.7.1959/8.8.1959. (iv) (a) 2 summer ploughings, puddling and levelling. (b) Transplanting. (c) 25 lb./ac. (d) 6°×9°. (e) 1 to 2. (v) 60 lb./ac. of N as A/S. (vi) As per treatments. (vii) Irrigated. (viii) Hand-weeding. (ix) 45.04°. (x) 2.11.1959.

2. TREATMENTS:
   Main-plot treatments :
   2 varieties : V₁ = CO-13 and V₂ = T - 5322.

   Sub-plot treatments :

Low volume spraying is 0.5 % of copeosal at 20 gallons/acre and normal volume spraying is 0.5 % of copeosal at 100 gallons/acre.

3. DESIGN :
   (i) Split-plot. (ii) (a) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 21' × 12.75'. (b) 20' × 11.25'. (v) 1 row around. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Blast infection. (iv) (a) 1933—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1386 lb./acre. (ii) (a) 290.8 lb./acre. (b) 119.6 lb./acre. (iii) Interaction of V × T alone is significant. (iv) Av. yield of grain in lb./acre.

<table>
<thead>
<tr>
<th></th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>1220</td>
<td>1400</td>
<td>1347</td>
<td>1338</td>
<td>1326</td>
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<tr>
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<td>1559</td>
<td>1300</td>
<td>1446</td>
</tr>
<tr>
<td>Mean</td>
<td>1361</td>
<td>1412</td>
<td>1453</td>
<td>1319</td>
<td>1386</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. V marginal means = 102.8 lb./ac.
2. T marginal means = 59.8 lb./ac.
3. T means at the same level of V = 84.5 lb./ac.
4. V means at the same level of T = 126.2 lb./ac.
Crop: Paddy (Kharif)
Site: Central Rice Res. Instt., Cuttack.

Object: To study the effect of spraying of copesal against blast on medium varieties of Paddy.

1. BASAL CONDITIONS:
   (a) Nil. (b) Paddy. (c) 60 to 80 lb/acre of N as A/S in two doses. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 2.7.1959/18.8.1959. (iv) (a) 2 summer ploughings, puddling and levelling. (b) Transplanting. (c) 25 lb/acre. (d) 6" x 9". (e) 1 to 2. (v) 40 lb/acre of N as A/S. (vi) As per treatments. (vii) Irrigated. (viii) Hand weeding. (ix) 45.04". (k) 21.11.1959.

2. TREATMENTS:
Main-plot treatments:
2 varieties: V1=T-114S and V2=Sm-8.
Sub-plot treatments:
4 spraying treatments: T4=Control (no spray), T1=Low volume sprayings before flowering on 24.8.1959 and 4.9.1959, T2=Normal volume sprayings after flowering on 10.10.1959 and 29.10.1959 and T3=T1+T2.
Low volume spraying is 0.5% of copesal at 20 gallons/ac. and normal volume spraying is 0.5% of copesal at 100 gallons/ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 21' x 12.75", (b) 20' x 11.25", (v) 1 row around. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Blast infection. (iv) (a) 15.53—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2133 lb/ac. (ii) (a) 359.5 lb/acre (b) 187.4 lb/acre. (iii) V effect alone is highly significant. (iv) Av. yield of grain in lb/acre.

<table>
<thead>
<tr>
<th></th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>2159</td>
<td>2250</td>
<td>2551</td>
<td>2648</td>
<td>2570</td>
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<tr>
<td>V2</td>
<td>1733</td>
<td>1738</td>
<td>1658</td>
<td>1658</td>
<td>1697</td>
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</tbody>
</table>

Mean 2146 2129 2104 2153 2133

S.E. of difference of two
2. T marginal means = 93.7 lb/acre.
3. T means at the same level of V = 132.5 lb/acre.
4. V means at the same level of T = 171.2 lb/acre.

Crop: Paddy (Kharif).
Site: Central Rice Res. Instt., Cuttack.

Object: To study the effect of spraying of copesal against blast on late varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) 60 to 80 lb/acre of N in 2 doses as A/S. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 2.7.1959/18.8.1959. (iv) (a) 2 summer ploughings, puddling and levelling. (b) Transplanting. (c) 25 lb/acre. (d) 6" x 9". (e) 1 to 2. (v) 40 lb/acre of N as A/S. (vi) As per treatments. (vii) Irrigated. (viii) Hand weeding. (ix) 45.35”. (k) 21.12.1959.
2. TREATMENTS:
Main-plot treatments:
2 varieties: \( V_1 = \text{AKP-9} \) and \( V_2 = \text{ASD-5} \).
Sub-plot treatments:
4 spraying treatments: \( T_0 = \text{Control (no spray)} \), \( T_1 = \text{Low volume sprayings before flowering on 24.8.1959 and 4.9.1959} \), \( T_2 = \text{Normal volume sprayings after flowering on 5.11.1959 and 16.11.1959} \), and \( T_3 = T_1 + T_2 \).
Low volume spraying is 0.5% of \( \text{crop sal} \) at 20 gallons/acre, and normal volume spraying is 0.5% of \( \text{crop sal} \) at 10 gallons/acre.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots; each replication has 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 21' x 12.75'. (b) 20' x 11.25'. (v) 1 row around. (vi) Yes.

4. RESULTS:
(i) 1736 lb./acre. (ii) (a) 412.5 lb./acre. (b) 226.6 lb./acre. (iii) V effect alone is significant. (iv) Av. yield of grain in lb./acre.

<table>
<thead>
<tr>
<th></th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>Mean</th>
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<td>1999</td>
<td>2150</td>
<td>2091</td>
<td>2106</td>
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<tr>
<td>( V_2 )</td>
<td>1217</td>
<td>1403</td>
<td>1169</td>
<td>1073</td>
<td>1166</td>
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<tr>
<td>Mean</td>
<td>1701</td>
<td>1701</td>
<td>1660</td>
<td>1683</td>
<td>1726</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. V marginal means = 156.5 lb./acre.
2. T marginal means = 113.3 lb./acre.
3. T means at the same level of V = 160.2 lb./acre.
4. V means at the same level of T = 209.1 lb./acre.

---

Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.
Type: 'DC'.
Ref: C.R.R.I. 54(17).
Object: To study the effect of herbicides with and without weeding.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 11.6.1954/19.7.1954. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 9' x 10', (e) 2 to 3. (v) Nil. (vi) T=141 (medium). (vii) Irrigated. (viii) As per treatments. (ix) 55.24'. (x) 7.12.1954.

2. TREATMENTS:
All combinations of (1) and (2) + one extra treatments
(i) 2 weeding treatments: \( W_0 = \text{No weeding} \) and \( W_1 = \text{Weeding} \).
(ii) 3 chemical treatments: \( C_0 = 0 \), \( C_1 = \text{Chloroxene} \), and \( C_2 = \text{Phenoxylene} \).
Extra treatments: \( T_1 = \text{Weeding with Japanese weeder} \).

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 62.5' x 12'. (b) 60' x 10'. (v) 1 row around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height, tiller counts and ear-length measurements. (iv) (a) 1951–1954. (b) N.A. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 4012 lb./ac.  (ii) 46.2 lb/ft.  (iii) All effects are highly significant.  (iv) Av. yield of grain in lb./ac.

\[ T_1 = 4363 \text{ lb./ac.} \]

<table>
<thead>
<tr>
<th></th>
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<th>C_2</th>
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</thead>
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<td>4117</td>
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<tr>
<td>W_1</td>
<td>4410</td>
<td>3385</td>
<td>3600</td>
<td>3792</td>
</tr>
</tbody>
</table>

S.E. of C marginal mean = 16.3 lb./ac.
S.E. of W marginal mean = 13.3 lb./ac.
S.E. of body of table or control mean = 20.1 lb./ac.

Crop: Paddy (*K. parifl.*).  
Site: Central Rice Res. Inst., Cuttack.  
Ref: C.R.8./L. 59/50.  
Type: 'DM'.

Object:—To study the effect of spraying herbicides at different stages of plant growth in controlling the weeds and affecting the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Paddy.  (c) N.A.  (ii) (a) Clay loam.  (b) Soil analysis, C.R.I., Cuttack.  (iii) 17.6.1956 to 10.8.1955.
   (iv) (a) 4 ploughings, levelling and levelling.  (b) Transplanted.  (c) 25 lb./ac.  (d) 10" x 6".  (e) 2 to 3.
   (v) Nil.  (vi) T-141 (late).  (vii) Irrigated.  (viii) 2 to 3 intercultures with Japanese weeder and 1 hand weeding.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of N : N_0=0 and N_1=30 lb./ac. of N.
   Sub-plot treatments:
   All combinations of (1) and (2): 2 extra treatments
   (1) 3 times of application of chemicals: T_1=2, T_2=6 and T_3=10 weeks after planting.
   (2) 2 chemical treatments: C_1=Phenothylen at 1 gallon/ac. and C_2=Chloroxone at 2 lb./ac.
   2 extra treatments: W_0=Control and W_1=Hand weeding.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 2 main-plots/block; 8 sub-plots/main-plot.  (b) N.A.  (ii) 4: (iv) (a) N.A.  (b) 22.5" x 14".
   (v) N.A.  (v) Yes.

4. GENERAI:
   (i) Satisfactory.  (ii) Little attack of grain spoiling fungus.  (iii) Yield of grain and straw, height, tiller counts and ear-length measurements.  (iv) (a) 1955—1957.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
   (i) 2730 lb./ac.  (ii) (a) 59.6 lb./ac.  (b) 175.1 lb./ac.  (iii) Main effects of N, T, W and N x T interaction are highly significant. Chemical vs. no chemical is significant.  (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<td>W_1</td>
<td>3009</td>
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<td>2770</td>
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</tbody>
</table>

Mean 2805 2480 2642
S.E. of difference of two
1. N marginal means = 49.3 lb./ac.
2. W marginal means = 87.6 lb./ac.
3. W means at the same level of N = 123.8 lb./ac.
4. N means at the same level of W = 100.5 lb./ac.

<table>
<thead>
<tr>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>Mean</th>
<th>C_1</th>
<th>C_2</th>
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<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 28.4 lb./ac.
2. C marginal means = 30.0 lb./ac.
3. T marginal means = 61.9 lb./ac.
4. C means at the same level of N = 71.5 lb./ac.

Crop :- Paddy (Kharif).
Site :- Central Rice Res. Instt., Cuttack.

Object :- To study the effects of spraying herbicides at different stages of plant growth, in controlling weeds and affecting the yield of grain of crop of Paddy.

1. BASAL CONDITIONS :
   (i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I. Cuttack. (iii) 5.7.1956/11.8.1956. (iv) (a) 4 ploughings, ladderling and levelling. (b) Transplanted. (c) N.A. (d) 10" x 6".
   (e) 2 to 3. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 82.73%. (x) N.A.

2. TREATMENTS and J. DESIGN :
   Same as in expt. no. 55(27) on page 113.

4. GENERAL :
   (i) Satisfactory. (ii) N.A. (iii) Yield of grain and straw, height and tiller counts measurements. (iv) (a) 1955-1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
   (i) 1966 lb./ac. (ii) (a) 134.1 lb./ac. (b) 163.6 lb./ac. (iii) N and T effects are highly significant. W effect and interaction N x T x C are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N_0</th>
<th>N_1</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>1810</td>
<td>2115</td>
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<tr>
<td>Mean</td>
<td>1588</td>
<td>2188</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 67.1 lb./ac.
2. W marginal means = 81.8 lb./ac.
3. W means at the same level of N = 115.7 lb./ac.
4. N means at the same level of W = 105.8 lb./ac.
Crop : **Paddy (Kharif)**. 

Site : Central Rice Res. Inst., Cuttack. 

Ref : C.R.R.I. 57(3). 

Type : ‘DM’. 

Object : To determine the optimum time of spraying herbicides in controlling weeds and affecting the yield of transplanted crop of Paddy.

### 1. BASAL CONDITIONS : 

(i) (a) Nil. (b) Paddy. (c) N.A.  
(ii) (a) Clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack.  
(iii) 3.7.1957/22.8.1957.  
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) BAM—9 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 29.47’. (x) 27.12.1957.

### 2. TREATMENTS : 

Same as in expt. no. 55(27) on page 113.

### 3. DESIGN : 

(i) Split-plot. (ii) (a) 2 main-plots/block; 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 15’ x 15’. (b) N.A. (v) N.A. (vi) Yes.

### 4. GENERAL : 

(i) Satisfactory. (ii) Nil. (iii) Yield of grain and straw, height, tiller counts and ear-length measurements.  
(iv) (a) 1955—1958. (b) N.A. (c) N.A. (v) to (vii) Nil.

### 5. RESULTS : 

(i) 2844 lb/ac. (ii) (a) 250.0 lb/ac. (b) 238.0 lb/ac.  
(iii) Chemical vs. no chemical is highly significant. Interaction N×T×C is highly significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>N0</th>
<th>N2</th>
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</tr>
</thead>
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<tr>
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<td>2986</td>
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<td>W1</td>
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<td>3055</td>
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<tr>
<td>Mean</td>
<td>2904</td>
<td>3137</td>
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</tbody>
</table>

S.E. of difference of two  

1. N marginal means  = 125.0 lb/ac.  
2. W marginal means  = 119.0 lb/ac.  
3. W means at the same level of N  = 168.3 lb/ac.  
4. N means at the same level of W  = 172.6 lb/ac.
Crop = Paddy (Kharif).
Site = Central Rice Res. Instit., Cuttack.

Object: To determine the optimum time of spraying herbicides in controlling weeds and affecting the yield of the transplanted Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R. R.I., Cuttack. (iii) N.A. (iv) 1956-1958. (v) (a) 4 ploughings, leveling and levelling. (b) Transplanted. (c) N.A. (d) 9'×9'. (e) 2 to 3. (v) Nil. (vi) B.A.M.—9 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 57.94'. (x) 25.12.1958.

2. TREATMENTS:
   Same as in exp. no. 55(27) on page 113.

3. DESIGN:
   (i) Split-plot. (ii) 2 main-plots/block: 8 sub-plots/main-plot. (b) N.A. (iii) 4'. (iv) (a) 15'×15'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain and straw yield, height, tiller counts and ear-length measurements. (iv) (a) 1956-1958. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1839 lb./ac. (ii) (a) 282.0 lb. /ac. (b) 241.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
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<th>C1</th>
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<td>2780</td>
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<td>C1</td>
<td>2762</td>
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</table>

S.E. of difference of two
1. N marginal means = 22.2 lb./ac.
2. C marginal means = 68.7 lb./ac.
3. T marginal means = 84.1 lb./ac.
4. C means at the same level of N = 97.2 lb./ac. S.E. of body of C×T table = 119.0 lb./ac.

---

Crop = Paddy (Kharif).
Site = Central Rice Res. Instit., Cuttack.

Object: To determine the optimum time of spraying herbicides in controlling weeds and affecting the yield of the transplanted Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, C.R. R.I., Cuttack. (iii) N.A. (iv) 1956-1958. (v) (a) 4 ploughings, leveling and levelling. (b) Transplanted. (c) N.A. (d) 9'×9'. (e) 2 to 3. (v) Nil. (vi) B.A.M.—9 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 57.94'. (x) 25.12.1958.

2. TREATMENTS:
   Same as in exp. no. 55(27) on page 113.

3. DESIGN:
   (i) Split-plot. (ii) 2 main-plots/block: 8 sub-plots/main-plot. (b) N.A. (iii) 4'. (iv) (a) 15'×15'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain and straw yield, height, tiller counts and ear-length measurements. (iv) (a) 1956-1958. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1839 lb./ac. (ii) (a) 382.0 lb./ac. (b) 241.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
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</tr>
<tr>
<td>Mean</td>
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<td>1833</td>
<td>1758</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 191.0 lb./ac.
2. W marginal means = 120.5 lb./ac.
3. W means at the same level of N = 170.4 lb./ac.
4. N means at the same level of W = 225.8 lb./ac.
Crop: Paddy (Kharif).
Site: Central Rice Res. Inst., Cuttack.
Type: 'B'.

Object: To determine a judicious combination of cultural and chemical methods for effective control of weeds and increasing the yield of Paddy.

1. BASAL CONDITIONS:
   (i) G.M. — Paddy. (b) Fallow. (c) Nil. (d) Light clay loam. (e) Seed and analysis, C.R.R.I., Cuttack. (iii) 1.7.1959/27.8.1959. (iv) (a) Ploughing with tractor and 2 puddlings. (b) Transplanted. (c) 25 lb./ac. (d) 9"×6". (e) 2 to 3. (vi) Nil. (vii) TY01. (viii) Nil. (ix) As for Treatments. (x) 45.33°, (xi) 1st. week of December, 1959.

2. TREATMENTS:
18 spraying treatments: T0=Control, T1=Spraying 2 weeks after planting (at 2 lb. acid. equivalent as Phenoxylene), T2=Spraying 6 weeks after planting (at 2 lb. acid equivalent as Phenoxylene), T3=Japanese weeder 2 weeks after planting, T4=Japanese weeder 6 weeks after planting, T5=Japanese weeder 10 weeks after planting, T6=Japanese weeder 2 weeks after and spraying 6 weeks after planting, T7=Japanese weeder 6 weeks after and spraying 10 weeks after planting, T8=Japanese weeder 6 weeks after and spraying 10 weeks after planting, T9=Japanese weeder 6 weeks after and Japanese weeder 10 weeks after planting, T10=Japanese weeder 2 and 6 weeks and spraying 10 weeks after planting, T11=Japanese weeder 2, 6 and 10 weeks and spraying 10 weeks after planting, T12=Japanese weeder 2, 6 and 10 weeks and spraying 10 weeks after planting, T13=Hand weeding 6 weeks and spraying 10 weeks after planting and T14=Hand weeding 6 weeks after planting.

3. DESIGN:
   (i) R.B.D. (ii) 18. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 20×10.5. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Weed population, height, tiller counts and yield of grain. (iv) (a) 1959—1961. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains in October. (vii) Nil.

5. RESULTS:
   (i) 2470 lb./ac. (ii) 332.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ | T₆ | T₇ | T₈ | T₉ | T₁₀ | T₁₁ | T₁₂ | T₁₃ | T₁₄ | T₁₅ | T₁₆ | T₁₇ | T₁₈ | T₁₉ | T₂₀ |
Av. yield | 2631 | 2399 | 2366 | 2740 | 2561 | 2641 | 2484 | 2542 | 2581 | 2538 | 2089 | 2138 | 277 | 2631 | 2561 | 2484 | 2542 | 2581 | 2538 | 2089 | 2138 | 277 |

S.E./mean = 166.0 lb./ac.

Crop : Paddy.
Site : Central Rice Res. Inst., Cuttack.
Ref : C.R.R.I. 58(30).
Type : 'MV'.

Object : To study the effect of different levels of N on different varieties of Paddy.

1. BASAL CONDITIONS:
(i) (a) Fallow—Paddy. (b) Fallow. (c) Nil. (ii) (a) Light clay loam. (b) Refer soil analysis, C.R.R.I., Cuttack. (iii) 4.7.1958/26.8.1958. (iv) (a) Ploughing, puddling and laddering by tractor. (b) Transplanting. (c) 25 lb./ac. (d) 6' x 10'. (e) 2 to 3. (f) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Inter-culture and weeding. (ix) 30.8'. (x) 17.11.1958 to 6.12.1958.

2. TREATMENTS:
Main-plot treatments:
5 levels of N as A/S: N₀ = 0, N₁ = 20, N₂ = 40, N₃ = 60 and N₄ = 80 lb./ac.
Sub-plot treatments:
6 medium varieties; V₁ = T-635, V₀ = PF-13, V₃ = EHM-114-241-2-66, V₄ = T-141, V₅ = T-1879 and V₆ = BAM-9 x Norin-U.

3. DESIGN:
(i) Split-plot. (ii) (a) 5 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 2' x 10'. (b) 2' x 8'. (c) 1' x 9'. (vi) Yes.

4. GENERAL:

5. RESULTS:
(i) 176.0 lb./ac. (ii) 276.0 lb./ac. (iii) 365.0 lb./ac. (iii) Main effects of N and V are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
<th>V₆</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1317</td>
<td>1625</td>
<td>1059</td>
<td>1695</td>
<td>2044</td>
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<tr>
<td>N₁</td>
<td>1585</td>
<td>2001</td>
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<tr>
<td>N₂</td>
<td>1640</td>
<td>2270</td>
<td>1237</td>
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<tr>
<td>N₃</td>
<td>1671</td>
<td>2327</td>
<td>1801</td>
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<td>2644</td>
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<tr>
<td>N₄</td>
<td>1544</td>
<td>2503</td>
<td>1436</td>
<td>2524</td>
<td>2527</td>
<td>1994</td>
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<tr>
<td>Mean</td>
<td>1511</td>
<td>2145</td>
<td>1322</td>
<td>2238</td>
<td>2318</td>
<td>1839</td>
</tr>
</tbody>
</table>
S.E. of difference of two
1. N marginal means = 58.7 lb./ac.
2. V marginal means = 133.3 lb./ac.
3. V means at the same level of N = 298.0 lb./ac.
4. N means at the same level of V = 278.3 lb./ac.

Crop :- Paddy.
Site :- Central Rice Res. Instt., Cuttack.
Ref :- C.R.R.I. 50(31).
Type :- ‘MV’.

Object :- To study the effect of N and P on different varieties of Paddy.

1. BASAL CONDITIONS :
(i) (a) Fallow—Rice.  (b) Fallow.  (c) Nil.  (ii) (a) Clay loam.  (b) Refer soil analysis, C.R.R.I., Cuttack.  (iii) 11.7.1958/12.8.1958.  (iv) (a) 4 ploughings with iron plough.  (b) Transplanted after dry nursery.  (c) 25 lb./ac.  (d) 9" x 9".  (e) 2 to 3.  (f) Nil.  (g) As per treatments.  (h) Irrigated.  (iv) Intercultural and hand weeding.  (iv) 50.8".  (v) 9.12.1958.

2. TREATMENTS :
Main-plot treatments :
All combinations of (1) and (2)
(1) 4 levels of N : N₀ =0, N₁ =30, N₂ =60 and N₃ =90 lb./ac.
(2) 2 levels of P₀₂ : P₀ =0 and P₁ =50 lb./ac.
Sub-plot treatments :

3. DESIGN :
(i) Split-plot.  (ii) (a) 8 main-plots/replication; 6 sub-plots/main-plot.  (b) N.A.  (iii) 2.  (iv) (a) N.A.  (b) 17.3" x 114".  (v) N.A.  (vi) Yes.

4. GENERAL :
(i) Average.  (ii) Nil.  (iii) Tiller counts and grain yield.  (iv) (a) 1958 - 1560.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS :
(i) 2486 lb./ac.  (ii) (a) 585.0 lb./ac.  (b) 269.0 lb./ac.  (iii) Main effect of V alone is highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
<th>V₆</th>
<th>Mean</th>
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<td>N₀</td>
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<td>2423</td>
<td>2386</td>
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<td>2235</td>
<td>2622</td>
<td>2421</td>
<td>2442</td>
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<td>N₁</td>
<td>2887</td>
<td>2578</td>
<td>2821</td>
<td>2524</td>
<td>2377</td>
<td>2462</td>
<td>2608</td>
<td>2590</td>
<td>2626</td>
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<tr>
<td>N₂</td>
<td>3220</td>
<td>2839</td>
<td>2687</td>
<td>2541</td>
<td>1963</td>
<td>2935</td>
<td>2697</td>
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<td>N₃</td>
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<td>2451</td>
<td>2267</td>
<td>2178</td>
<td>1818</td>
<td>2258</td>
<td>2218</td>
<td>2120</td>
<td>2316</td>
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<tr>
<td>Mean</td>
<td>2710</td>
<td>2573</td>
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<td>2418</td>
<td>2098</td>
<td>2569</td>
<td>2486</td>
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P₀ | 2680 | 2594 | 2521 | 2398 | 2098 | 2471 |
P₁ | 2759 | 2551 | 2559 | 2438 | 2097 | 2667 |
<table>
<thead>
<tr>
<th>S.E. of difference of two</th>
<th>1. N marginal means</th>
<th>5. N means at the same level of V</th>
<th>= 168.9 lb./ac.</th>
<th>4. V means at the same level of N</th>
<th>= 190.2 lb./ac.</th>
<th>7. P means at the same level of V</th>
<th>= 168.9 lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. P marginal means</td>
<td>6. V means at the same level of P</td>
<td>= 119.4 lb./ac.</td>
<td>3. V marginal means</td>
<td>= 95.1 lb./ac.</td>
<td>7. P means at the same level of V</td>
<td>= 171.2 lb./ac.</td>
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</tr>
</tbody>
</table>
Indian Institute of Sugarcane Research
LUCKNOW
1. Name of the experimental station: Indian Institute of Sugarcane Research.
2. Tehsil: Lucknow.
3. District: Lucknow.
4. Address: Director, Indian Institute of Sugarcane Research, Lucknow.
6. Latitude N.A. Longitude N.A. Altitude N.A.
7. Weather research, multiplication or demonstration farm: Research farm.
8. Whether State, University or private managed: Indian Council of Agricultural Research.
9. Programme of research: Fundamental and applied research on the different aspects of sugarcane culture.
10. Normal cropping pattern: I Year Sugarcane plant II Year III Year
    - Green manuring - Wheat
    - Green manuring - Sugarcane
11. Type of tract it represents: Alluvial loam soil. Semi-arid. The parent material is old alluvium and is no more subject to inundation.
13. Soils:
   (a) Broad soil types: Type IV/I and type IV/II according to classification scheme followed by sugarcane soil survey staff of U.P.
   (i) Depth: 72”.
   (ii) Colour: Grey or brownish grey.
   (iii) Structure: Friable.
   (b) Chemical analysis:
<table>
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<tr>
<th></th>
<th>Type IV/I</th>
<th>Type IV/II</th>
</tr>
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<tbody>
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<td>pH</td>
<td>7.0–7.8</td>
<td>7.6</td>
</tr>
<tr>
<td>Loss of ignition</td>
<td>3.6</td>
<td>2.44</td>
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<tr>
<td>HCl in solubles</td>
<td>81.76</td>
<td>84.73</td>
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<tr>
<td>R₂O₃</td>
<td>9.12</td>
<td>8.73</td>
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<td>Fe₂O₃</td>
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<td>P₂O₅</td>
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<td>0.20</td>
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<tr>
<td>K₂O</td>
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<td>0.70</td>
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<tr>
<td>Organic carbon</td>
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<td>0.585</td>
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<td>Type IV/II</td>
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<tr>
<td>Sand</td>
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<td>Clay</td>
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<tr>
<td>CaCO₃</td>
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14. Normal average rainfall in mm:

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<tr>
<td>Rainfall</td>
<td>60.3</td>
<td>286.7</td>
<td>340.1</td>
<td>170.7</td>
<td>96.1</td>
<td>1.8</td>
<td>4.9</td>
<td>24.6</td>
<td>6.6</td>
<td>8.7</td>
<td>2.0</td>
<td>4.9</td>
<td>24.6</td>
</tr>
</tbody>
</table>

(The period on which the figures are based is 1956-1964.)

15. Irrigation facilities available; year from which the facilities were made available:

Canal irrigation; since its inception.

16. Whether any proper drainage system exists:

Yes.
Crop: Sugarcane.
Object: To study the effect of different levels of N and P through different sources on Sugarcane.

1. BASAL CONDITIONS:
   (i) to (c) N.A. (ii) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 12.2.1958. (iv)
   (a) to (c) N.A. (d) Rows 5' apart. (e) N.A. (v) N.A. (vi) CO 617. (vii) Irrigated. (viii) N.A.
   (a) 13.1.1959.

2. TREATMENTS:
11 manural treatments: \[ M_0 = \text{Control}, M_1 = 80 \text{ lb./ac. of } N \text{ as Urea}, M_2 = 120 \text{ lb./ac. of } N \text{ as Urea}, M_3 = 80 \text{ lb./ac. of } N \text{ as } G.N.C.+A/S, M_4 = 120 \text{ lb./ac. of } N \text{ as } G.N.C.+A/S, M_5 =
\] \[ M_1 + 80 \text{ lb./ac. of } P_2O_5 \text{ as Super}, M_6 = M_2 + 120 \text{ lb./ac. of } P_2O_5 \text{ as Super}, M_7 = M_3 + 80 \text{ lb./ac. of } P_2O_5 \text{ as Super}, M_8 = M_2 + 120 \text{ lb./ac. of } P_2O_5 \text{ as Super}, M_9 = \text{Compleas super giving } 80 \text{ lb./ac. each of } N \text{ and } P_2O_5, M_{10} = \text{Compleas super giving } 120 \text{ lb./ac. each of } N \text{ and } P_2O_5. \]

Table of fertilizer quantity applied at planting (12.2.1958) and at tilling phase (17.6.1958).

3. DESIGN:
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 3. (iv) (a) 55’ x 21’. (b) 49’ x 15’. (v) 3’ x 3’.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of sugarcane. (iv) N.A. (b) No. (c) Nil. (v) Yes. (vi) Nil.

5. RESULTS:
   (i) 27.19 tons/ac. (ii) 2.54 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

\[
\begin{array}{cccccccc}
\text{Treatment} & M_0 & M_1 & M_2 & M_3 & M_4 & M_5 & M_6 & M_7 \\
\text{Av. yield} & 26.54 & 24.48 & 29.05 & 28.32 & 28.56 & 25.75 & 24.95 & 25.95 & 28.49 & 28.49 & 28.09 \\
\text{S.E./mean} & 1.47 & & & & & & & \\
\end{array}
\]

Crop: Sugarcane.
Object: To study the effect of different levels of N and P through different sources on Sugarcane.

1. BASAL CONDITIONS:
   (i) to (c) N.A. (ii) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 11 and 12.3.1959.
   (iv) (a) to (c) N.A. (d) Rows 3' apart. (e) N.A. (v) N.A. (vi) CO 617. (vii) Irrigated. (viii) N.A.
   (a) 17 and 18.1.1960.

2. TREATMENTS:
13 manural treatments: \[ M_0 = \text{Control}, M_1 = 80 \text{ lb./ac. of } N \text{ as Urea}, M_2 = 120 \text{ lb./ac. of } N \text{ as Urea}, M_3 =
\] \[ 80 \text{ lb./ac. of } N \text{ as } G.N.C.+A/S, M_4 = 120 \text{ lb./ac. of } N \text{ as } G.N.C.+A/S, M_5 =
\] \[ 80 \text{ lb./ac. of } N \text{ as Urea from Aldelhyde}, M_6 = 120 \text{ lb./ac. of } N \text{ as Urea from Aldelhyde}, M_7 = M_2 + 80 \text{ lb./ac. of } P_2O_5 \text{ as Super}, M_8 = M_3 + 120 \text{ lb./ac. of } P_2O_5 \text{ as Super}, M_9 = \text{Compleas super giving } 80 \text{ lb./ac. each of } N \text{ and } P_2O_5, M_{10} = \text{Compleas super giving } 120 \text{ lb./ac. each of } N \text{ and } P_2O_5. \]

\[
\begin{array}{cccccccc}
\text{Treatment} & M_0 & M_1 & M_2 & M_3 & M_4 & M_5 & M_6 & M_7 & M_8 & M_9 & M_{10} & M_{11} & M_{12} \\
\text{Av. yield} & 18.54 & 18.04 & 20.21 & 16.41 & 17.08 & 17.33 & & & & & \\
\text{S.E./mean} & 2.36 & & & & & & \\
\end{array}
\]
Crop: Sugarcane.
Object: To study the effect of different levels of N with and without P on Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) to (d) N.A.  (ii) 57 sets (3 budded)/row.  (d) Rows 3' apart.  (e) N.A.  (v) Irrigated.  (vii) N.A.  (x) 11 to 28.2.1956.

2. TREATMENTS:
   6 manurial treatments: M1 = Control, M2 = 80 lb/ac. of N as A/S, M3 = 57 lb/ac. of P2O5 as Super, M4 = M3 + 80 lb/ac. of P2O5 as Super and M5 = Complex supra giving 80 lb/ac, each of N and P2O5.

3. DESIGN:
   (i) R.B.D.  (ii) 6. (b) N.A. (iii) 5.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of sugarcane. (iv) 1955–N.A. (v) Nil. (vii) Nil.

5. RESULTS:
   (i) 17.94 tons/ac. (ii) 16.56 17.57 17.12 17.96 16.90
   (iii) 32.39 35.50 36.69 37.84
   S.E./mean = 1.94 tons/ac.

Crop: Sugarcane.
Object: To study the effect of spraying of trace-elements and nutrients on Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) Sandy loam. (c) N.A. (ii) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 17.94 tons/ac. (iv) (a) 342 sets (3 budded)/plot. (d) Rows 3' apart.  (e) N.A.  (v) CO 513.  (vi) Irrigated.  (vii) N.A.  (x) 11 to 28.2.1956.

2. TREATMENTS:
   Main-plot treatments:
   All combination of (1) and (2)
   (1) 2 levels of spray of N as A/S: N0 = 0 and N1 = 2 % solution at 10 lb/ac.
   (2) 2 levels of spray of P2O5 as Super: P0 = 0 and P1 = 2 % solution at 10 lb/ac.
   Sub-plot treatments:
   6 trace-elements at 10 ppm: T1 = Molybdenum chloride, T2 = Stannous chloride, T3 = Zinc chloride, T4 = Copper chloride, T5 = Manganese chloride and T6 = Cobalt chloride.

3. DESIGN:
   (i) Split-plot.  (ii) 4 main-plots/replication; 6 sub-plots/main-plot.  (b) N.A.  (iii) 3.  (iv) (a) 35' x 21'.  (b) 49' x 14'.  (v) 3' x 3.5'.  (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1955–N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 16.22 tons/ac.  (ii) 12.76 tons/ac.  (b) 3.11 tons/ac.  (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>Mean</th>
<th>P0</th>
<th>P1</th>
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<td>N0</td>
<td>17.94</td>
<td>16.56</td>
<td>17.57</td>
<td>17.12</td>
<td>17.96</td>
<td>16.90</td>
<td>17.34</td>
<td>17.54</td>
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<tr>
<td>N1</td>
<td>17.10</td>
<td>16.07</td>
<td>15.49</td>
<td>15.76</td>
<td>15.62</td>
<td>14.30</td>
<td>16.22</td>
<td>15.50</td>
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</table>
Crop: Sugar cane.
Site: Indian Instt. of Sugarcane Res., Lucknow. Type: 'M'.
Ref: I.I.S.R. 56(335).

Object:—To study the effect of spraying trace-elements and nutrients on Sugar cane.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Sanai. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. 
(ii) (a) 1 ploughing and 4 harrowings. (b) N.A. (c) 57 sets (3 budded)/row. (d) Rows 3' apart. (e) N.A. 
(v) 75 lb./ac. of N as G.M., G.N.C. and A.S. (vi) CO, 513. (vii) Irrigated. (viii) 7 intercultures, 7 weedings and 1 earthing up. 

2. TREATMENTS:
Main-plot treatments:
10 manurial treatments: 
M1 = Control (water application), M2 = 2% solution of A/S at 10 lb./ac. of N, M3 = 2% solution of Super at 10 lb./ac. of P2O5, M4 = 2% solution of A/S and Super at 10 lb./ac. each of N and P2O5 in 1:1 ratio, M5 =10 ppm of Zinc chloride, M6 =10 ppm of Manganese chloride, M7 =10 ppm of Copper chloride, M8 =10 ppm of Boric acid and M9 =10 ppm of Stannous chloride.

Sub-plot treatments:
2 methods of application : S1 = Through soil and S2 = Through foliar spray (3 sprayings).

3. DESIGN:
(i) Split-plot. (ii) (a) 10 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 3'. (iv) (a) 55'x2'. (b) 49'x14'. (v) 3'x3'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) and (b) N.A. (c) Nil. (v) to (vi) Nil.

5. RESULTS:
(i) 22.20 tons/ac. (ii) 2.07 tons/ac. (b) 2.62 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
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<td>21.89</td>
<td>20.57</td>
<td>22.14</td>
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</tbody>
</table>

S.E. of difference of two
1. M marginal means = 1.20 tons/ac
2. S marginal means = 0.68 tons/ac.
3. S means at the same level of M = 2.14 tons/ac.
4. M means at the same level of S = 1.93 tons/ac.

Crop: Sugar cane.
Site: Indian Instt. of Sugarcane Res., Lucknow. Type: 'M'.
Ref: I.I.S.R. 57(384).

Object:—To study the effect of spraying trace-elements on Sugar cane.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Sanai. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. 
(ii) (a) 1 ploughing, 4 harrowings and 5 plankings. (b) N.A. (c) 53 sets (3 budded)/row. (d) Rows 3' apart. (e) N.A. 
(v) 40 lb./ac. of N as sanai (G.M.) + 10 lb./ac. of N as G.N.C. + 25 lb./ac. of N as A/S. (vi) CO.S, 513. (vii) Irrigated. (viii) 6 intercultures and 6 weedings. (ix) and (x) N.A.
2. TREATMENTS:
Main-plot treatments:
10 trace-element solutions (0.5%) at 50 gallons/acre.
- $M_1$: Control (no application)
- $M_2$: Ferric chloride
- $M_3$: Molybdic acid
- $M_4$: Magnesium chloride
- $M_5$: Zinc chloride
- $M_6$: Manganese chloride
- $M_7$: Cobalt chloride
- $M_8$: Boric acid
- $M_9$: Stannous chloride

Sub-plot treatments:
- 2 times foliar spray: $T_1$ = During August and September and $T_2$ = During August alone.

3. DESIGN:
(i) Split-plot. (ii) 10 main-plots/replication; 2 sub-plots/sub-plot. (b) N.A. (iii) 3'. (iv) (a) 51'x21'.
- (v) 3'x3.5'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 7.76 tons/acre. (ii) (a) 2.74 tons/acre. (b) 1.97 tons/acre. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/acre.

<table>
<thead>
<tr>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
<th>$M_5$</th>
<th>$M_6$</th>
<th>$M_7$</th>
<th>$M_8$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>7.20</td>
<td>7.09</td>
<td>7.83</td>
<td>7.09</td>
<td>7.15</td>
<td>7.30</td>
<td>7.20</td>
<td>7.43</td>
</tr>
<tr>
<td>$S_2$</td>
<td>7.60</td>
<td>7.01</td>
<td>8.19</td>
<td>7.92</td>
<td>9.00</td>
<td>7.51</td>
<td>8.59</td>
<td>8.23</td>
</tr>
<tr>
<td>Mean</td>
<td>7.65</td>
<td>7.03</td>
<td>8.01</td>
<td>7.51</td>
<td>8.08</td>
<td>7.41</td>
<td>7.90</td>
<td>7.83</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. $M$ marginal means = 1.58 tons/acre.
2. $S$ marginal means = 0.51 tons/acre.
3. $S$ means at the same level of $M$ = 1.64 tons/acre.
4. $M$ means at the same level of $S$ = 1.95 tons/acre.


Object: To study the effect of different levels of $P$ on the yield of sugarcane.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer to soil analysis, I.I.S.R., Lucknow. (iii) February, 1959.

2. TREATMENTS:
4 levels of $P_2O_5$: $P_0 = 0$, $P_1 = 100$, $P_2 = 200$ and $P_3 = 300$ lb/acre.

3. DESIGN:
(i) R.B.D. (ii) 4'. (b) N.A. (iii) 4'. (iv) (a) 24'x10'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1959-NA. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 22.02 tons/acre. (ii) 2.29 tons/acre. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$P_3$</th>
<th>$P_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>21.33</td>
<td>21.90</td>
<td>21.06</td>
<td>22.80</td>
<td>22.60</td>
</tr>
</tbody>
</table>

S.E./mean = 1.15 tons/acre.


Object: To find out the efficiency of different methods of placement of phosphatic fertilizers for sugarcane.
1. **BASAL CONDITIONS**

   (i) N.A.  
   (ii) N.A.  
   (iii) N.A.  
   (iv) 4 harrowings by tractor and 3 plantings.  
   (v) N.A.  
   (vi) 330 sets (3 budded/ac).  
   (vii) Rows 3' apart.  
   (viii) N.A.  
   (ix) As per treatments.  
   (x) N.A.

2. **TREATMENTS**

   All combinations of (1), (2) and (3)+2 extra treatments (2 plots each)

   (1) 2 varieties: V1=CO. 613 and V2=CO.K. 41
   (2) 2 times of application of P2O5: T1=Just after germination and T2=During tillering phase.
   (3) 2 methods of application of P2O5: M1=Top dressing and M2=At plough depth between rows.

   Extra treatments: V1 P0= V1 without P2O5 and V2 P0=V2 without P2O5.
   P2O5 is applied at 100 lb/ac.

3. **DESIGN**

   (i) Fact. in R.B.D.  
   (ii) N.A.  
   (iii) 6.  
   (iv) 5'x21',  
   (v) 49'x14',  
   (vi) 3'x3.5',  
   (vii) Yes.

4. **GENERAL**

   (i) and (ii) N.A.  
   (iii) Yield of sugar cane.  
   (iv) N.A.  
   (v) N.A.  
   (vi) Nil.

5. **RESULTS**

   (i) 26.87 tons/ac.  
   (ii) 2.70 tons/ac.  
   (iii) Only interaction V x T is significant.  
   (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>Mean</th>
<th>M1</th>
<th>M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>26.02</td>
<td>28.90</td>
<td>27.46</td>
<td>26.93</td>
<td>27.09</td>
</tr>
<tr>
<td>T2</td>
<td>27.03</td>
<td>25.81</td>
<td>26.42</td>
<td>26.51</td>
<td>26.34</td>
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<tr>
<td>Mean</td>
<td>26.53</td>
<td>27.36</td>
<td>26.94</td>
<td>26.72</td>
<td>27.17</td>
</tr>
<tr>
<td>M1</td>
<td>26.10</td>
<td>27.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>26.96</td>
<td>27.38</td>
<td></td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.55 tons/ac.  
S.E. of body of table or V P0 mean = 0.78 tons/ac.

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Crop :- Sugarcane.  
Ref :- I.I.S.R. 57(352).  
Site :- Indian Inst. of Sugarcane Res., Lucknow.  
Type :- "56V".

Object :- To study the effect of different levels of N on different varieties of Sugarcane.

1. **BASAL CONDITIONS**

   (i) N.A.  
   (ii) N.A.  
   (iii) N.A.  
   (iv) 13 and 14.3.1957.  
   (v) N.A.  
   (vi) 57 sets (3 budded/row).  
   (vii) Rows 3' apart.  
   (viii) N.A.  
   (ix) As per treatments.  
   (x) N.A.  
   (xi) 14 to 17.3.1958.

2. **TREATMENTS**

   Main-plot treatments:
   2 levels of N: N1=100 and N2=200 lb/ac.

   Sub-plot treatments:
3. DESIGN:
(i) Split-plot. (ii) 2 main-plots/replication; 8 sub-plots/min-plot. (b) N.A. (iii) 3. (iv) (a) 7.5’x15’. (b) 4’x12’. (v) 3’x3’. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 14.03 tons/ac. (ii) (a) 2.66 tons/ac. (b) 2.84 tons/ac. (iii) Main effect of V is highly significant and interaction N x V is significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
<td>N1</td>
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<td>17.03</td>
<td>14.40</td>
<td>15.13</td>
<td>15.24</td>
<td>5.15</td>
<td>15.76</td>
<td>13.28</td>
</tr>
<tr>
<td>N2</td>
<td>13.58</td>
<td>16.40</td>
<td>12.54</td>
<td>20.84</td>
<td>14.90</td>
<td>15.00</td>
<td>7.85</td>
<td>17.14</td>
<td>14.78</td>
</tr>
<tr>
<td>Mean</td>
<td>10.20</td>
<td>16.54</td>
<td>14.79</td>
<td>17.62</td>
<td>14.57</td>
<td>15.57</td>
<td>6.50</td>
<td>16.45</td>
<td>14.03</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. N marginal means = 0.77 tons/ac.
2. V marginal means = 1.64 tons/ac.
3. V means at the same level of N = 2.32 tons/ac.
4. N means at the same level of V = 2.30 tons/ac.


Object: - To study the effect of different levels of N, P and K on different varieties of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 13 and 14.3.1958. (iv) (a) and (b) N.A. (c) 27 sets/3 budded/row. (d) Rows 3’ apart. (e) N.A. (f) N.A. (g) As per treatments. (h) Irrigated. (i) N.A. (j) 18.3.1959.

2. TREATMENTS:
All combinations of (I), (2), (3) and (4)
(1) 3 levels of N : N0 ~0, N1 ~100 and N3 ~200 lb./ac.
(2) 3 levels of P2O5 : P0 ~0, P1 ~100 and P3 ~200 lb./ac.
(3) 3 levels of K2O : K0 ~0, K1 ~30 and K2 ~100 lb./ac.
(4) 2 varieties : V1 = CO. 4S3 and V2 = CO. 527.
$k$ of N and whole of P2O5 and K2O applied at planting. $\frac{1}{2}$ of N applied at tillering.

3. DESIGN:
(i) 9 x 2 confd. (ii) [9 plots/block and 6 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 25’x21’. (b) 19’x15’. (v) 3’x3’. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 14.03 tons/ac. (ii) 11.85 tons/ac. (iii) Main effect of V is highly significant and interaction P x K is significant. (iv) Av. yield of sugarcane in tons/ac.
Crop: Sugarcane.

Site: Indian Instt. of Sugarcane Res., Lucknow. Type: 'C'.

Object: To study the effect of different seed rates and spacings on Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Sand. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 6.3.1956. (iv) 5 harrowings by tractor. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) 40 lb./ac. of N as sanai G. M. + 10 lb./ac. of N as castor cake + 100 lb./ac. of N as A/S + 50 lb./ac. of P \(_2\)O\(_5\) as Super. (vi) CO. 453. (vii) Irrigated. (viii) 5 intercultures and 5 weedings. (ix) N.A. (x) 11 to 14.2.1957.

2. TREATMENTS:
   Main-plot treatments:
   - 2 spacings between rows: \(S_1 = 2'\) and \(S_2 = 3'\).

   Sub-plot treatments:
   - 3 seed rates: \(T_1 = 57\) setts (single budded)/row, \(T_2 = 57\) setts (2 budded)/row and \(T_3 = 57\) setts (3 budded)/row.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 55' x 18'. (b) 49' x 18'. (v) Yes. (v) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1956—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 21.68 tons/ac. (ii) 5.65 tons/ac. (b) 3.84 tons/ac. (iii) Only main effect of \(T\) is highly significant.

### TABLE

<table>
<thead>
<tr>
<th>(T_1)</th>
<th>(T_2)</th>
<th>(T_3)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(S_1)</td>
<td>20.59</td>
<td>21.39</td>
<td>26.57</td>
</tr>
<tr>
<td>(S_2)</td>
<td>15.22</td>
<td>21.26</td>
<td>24.65</td>
</tr>
<tr>
<td>Mean</td>
<td>18.11</td>
<td>21.32</td>
<td>25.61</td>
</tr>
</tbody>
</table>

S.E. of \(V\) marginal mean = 2.28 tons/ac.
S.E. of \(N\), \(P\) or \(K\) marginal mean = 2.80 tons/ac.
S.E. of body of \(V\) and \(N\), \(V\) and \(P\) or \(V\) and \(K\) table = 3.93 tons/ac.
S.E. of body of \(N\) and \(P\), \(N\) and \(K\) or \(P\) and \(K\) table = 4.84 tons/ac.
Crop: Sugarcane.  
Type: 'C'.

Object: To study the effect of different seed rates and spacings on Sugarcane.

1. Basal Conditions:
   (i) (a) N.A. (b) Sanai. (c) N.A.  
   (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow.  
   (iii) 6.3.1957.  
   (iv) (a) 4 harrowings and 2 ploughings by tractor. (b) N.A. (c) and (d) As per treatments.  
   (e) N.A.  
   (v) 150 lb./ac. of N as G.M., G.N.C. and A/S+150 lb./ac. of P2O5 as Super at planting.  
   (vi) CO, 453.  
   (vii) Irrigated.  
   (viii) 2 earthings and 4 intercultures.  

2. Treatments: 3 cultural treatments: C1=Autumn planted sugarcane, C2=Opium-poppy intersown in autumn planted sugarcane and C3=Opium-poppy followed by sugarcane planted in spring.

3. Design:
   (i) R.B.D.  
   (ii) 3.  
   (iii) 8.  
   (iv) (a) 55°x33'. (b) 49°x23'.  
   (v) 3°x3'.  
   (vi) Yes.

Results:

(i) 14.52 tons/ac.  
(ii) (a) 6.45 tons/ac.  
(iii) 4.54 tons/ac.  
(iii) Only main effect of T is significant.  
(iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>11.45</td>
<td>17.02</td>
<td>18.59</td>
<td>15.69</td>
</tr>
<tr>
<td>S2</td>
<td>8.68</td>
<td>16.67</td>
<td>14.69</td>
<td>13.35</td>
</tr>
<tr>
<td>Mean</td>
<td>10.07</td>
<td>16.85</td>
<td>16.64</td>
<td>14.52</td>
</tr>
</tbody>
</table>

S.E. of difference of two:

1. S marginal means = 2.31 tons/ac.
2. T marginal means = 1.92 tons/ac.
3. T means at the same level of S = 2.72 tons/ac.
4. S means at the same level of T = 3.20 tons/ac.

---

Crop: Sugarcane.  
Ref: I.I.S.R. 59(443).  
Type: 'C'.

Object: To study the effect of inter-cropping opium-poppy with Sugarcane.

1. Basal Conditions:
   (i) (a) N.A. (b) Sanai. (c) N.A.  
   (ii) (a) Loam soil. (b) Refer soil analysis, I.I.S.R., Lucknow.  
   (iv) (a) to (e) N.A.  
   (v) 40 lb./ac. of N as G.N.C.+60 lb./ac. of N as A/S to autumn planted cane and 80 lb./ac. of N as A/S to spring planted cane.  
   (vi) CO, S, 510 (early medium).  
   (vii) Irrigated.  
   (viii) N.A.  
   (ix) 56.4°.  
   (x) 14.2.1961.

2. Treatments:
   3 cultural treatments: C1=Autumn planted sugarcane, C2=Opium-poppy intersown in autumn planted sugarcane and C3=Opium-poppy followed by sugarcane planted in spring.

3. Design:
   (i) R.B.D.  
   (ii) 3.  
   (iii) 8.  
   (iv) (a) 55°x33'. (b) 49°x23'.  
   (v) 3°x3'.  
   (vi) Yes.
4. GENERAL:

(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1959—1960. (b) Nil. (c) Nil. (v) (a) and (b) Nil. (vi) Severe hailstorm in March caused total damage. (vii) Nil.

5. RESULTS:

(i) 21.48 tons/ac. (ii) 2.14 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>25.92</td>
<td>25.78</td>
<td>12.75</td>
</tr>
</tbody>
</table>

S.E./mean = 0.76 tons/ac.

**Crop:** Sugarcane.  
**Ref:** I.I.S.R. 55(328).  
**Site:** Indian Instt. of Sugarcane Res., Lucknow.  
**Type:** 'CV'.

Object: To study the effect of different dates of planting on different varieties of Sugarcane.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Sandy loam. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) As per treatments. (iv) (a) 4 harrowings by tractor. (b) N.A. (c) 57 setts (3 budded)/row. (d) Rows 3' apart. (e) N.A. (v) 50 lb./ac. of P₂O₅+40 lb./ac. of N as sanat (G.M.)+10 lb./ac. of N as G.N.C.+100 lb./ac. of N as A/S. (vi) As per treatments. (vii) Irrigated. (viii) 16 interculture and weeding operations. N A. (x) 1 to 5.4.1957.

2. TREATMENTS:

All combinations of (I) and (2)

(I) 2 varieties: V₁ = CO, 617 and V₂ = CO, 527.


During August and September the setts were planted on the side of ridge to avoid rotting of setts due to rain water.

3. DESIGN:

(i) Fact. in R.B.D. with 1 d.f. for V × D interaction totally confd. with blocks in all the replications. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 55'×31½'. (b) 49'×24½'. (v) 3'×3.5'. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1955—1957. (b) Nil. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 16.90 tons/ac. (ii) 3.80 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>D₅</th>
<th>D₆</th>
<th>D₇</th>
<th>D₈</th>
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<tbody>
<tr>
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<td>15.20</td>
<td>17.14</td>
<td>17.59</td>
<td>18.08</td>
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<td>V₂</td>
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<td>Mean</td>
<td>15.32</td>
<td>16.42</td>
<td>17.88</td>
<td>16.42</td>
<td>16.31</td>
<td>17.60</td>
<td>17.66</td>
<td>17.60</td>
<td>16.90</td>
</tr>
</tbody>
</table>

S.E. of V marginal mean = 0.78 tons/ac.
S.E. of D marginal mean = 1.55 tons/ac.
S.E. of body of table = 2.19 tons/ac.
Crop :- Sugarcane.  
Ref :- I.I.S.R. 56(352).  
Site :- Indian Instit. of Sugarcane Res., Lucknow.  
Type :- ‘CV’.

Object :- To study the effect of different dates of planting on different varieties of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Sanai. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis. I.I.S.R., Lucknow. (iii) As per treatments. (iv) (a) 2 ploughings and 1 planking. (b) N.A. (c) 37 setts (3 budded)/row. (d) 3' between rows. (e) N.A. (v) 30 lb./ac. of N as G.M. (Sanai) + 40 lb./ac. of N as G.N.C. + 80 lb./ac. of N as A/S + 50 lb./ac. of P2O5 as Super. (vi) As per treatments. (vii) 16 intercultures, weeding and earthing operations. (ix) N.A. (x) 21 to 26.3.1958 and 24.4.1958.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 varieties : V1 = CO. 617 and V2 = CO. 527.

3. DESIGN:
(i) Fact. in R.B.D. with 1 d.f. for V × D interaction totally confd. with blocks in all the replications. (ii) (a) 8 plots/block and 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 55' × 23'. (b) 49' × 21'. (v) 3' × 34'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 14.18 tons/ac. (ii) 3.55 tons/ac. (iii) Main effect of D is highly significant and effect of V is significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
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<td>8.47</td>
<td>15.32</td>
</tr>
<tr>
<td>V2</td>
<td>20.67</td>
<td>21.12</td>
<td>12.98</td>
<td>11.77</td>
<td>13.48</td>
<td>10.26</td>
<td>9.08</td>
<td>5.07</td>
<td>13.05</td>
</tr>
<tr>
<td>Mean</td>
<td>17.56</td>
<td>21.95</td>
<td>14.24</td>
<td>13.30</td>
<td>15.76</td>
<td>12.93</td>
<td>10.96</td>
<td>6.77</td>
<td>14.18</td>
</tr>
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</table>

S.E. of V marginal mean = 0.72 tons/ac.
S.E. of D marginal mean  = 1.45 tons/ac.
S.E. of body of table    = 2.05 tons/ac.

Crop :- Sugarcane.  
Ref :- I.I.S.R. 57(331).  
Site :- Indian Instit. of Sugarcane Res., Lucknow.  
Type :- ‘CV’.

Object :- To study the effect of different dates of planting on different varieties of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Sanai. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis. I.I.S.R., Lucknow. (iii) As per treatments. (iv) (a) and (b) N.A. (c) 43 setts (3 budded)/row. (d) Rows 3' apart. (e) N.A. (v) N.A. (vii) As per treatments. (viii) Irrigated. (vii) 16 intercultures, weeding and earthing operations. (ix) N.A. (x) 8 to 10.2.1959.

1. TREATMENTS:
All combinations of (1) and (2)
(1) 2 varieties : V1 = CO. 617 and V2 = CO. 527.
3. DESIGN:
(i) Fact. in R.B.D. with 1 d.f. for V×D interaction totally conf. with blocks in all the replications. (ii) (a) 7 plots/block and 2 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 41'×24'. (b) 35'×18'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 16.66 tons/ac. (ii) 3.25 tons/ac. (iii) Main effects of V and D are highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
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<td>V1</td>
<td>27.18</td>
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<td>15.60</td>
<td>15.87</td>
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<tr>
<td>V2</td>
<td>26.59</td>
<td>20.43</td>
<td>18.52</td>
<td>14.98</td>
<td>12.06</td>
<td>11.32</td>
<td>0.86</td>
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<tr>
<td>Mean</td>
<td>27.09</td>
<td>23.24</td>
<td>19.02</td>
<td>17.79</td>
<td>13.83</td>
<td>13.60</td>
<td>2.08</td>
</tr>
</tbody>
</table>

S.E. of V marginal mean = 0.61 tons/ac.
S.E. of T marginal mean = 1.15 tons/ac.
S.E. of body of table = 1.63 tons/ac.

Crop: Sugarcane.
Site: Indian Instt. of Sugarcane Res., Lucknow.
Type: 'CV'.

Object: To study the effect of different seasons of planting on different varieties of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Sandy loam. (c) Refer soil analysis, I.I.S.R., Lucknow. (ii) As per treatments.
(iv) (a) 5 harrowings by tractor and 5 plankings. (b) N.A. (c) 57 sets (3 budded)/row. (d) and (e) N.A.
(v) 150 lb./ac. of N as A/S and G.N.C in 2:1 ratio + 50 lb./ac. of P2O5 as Super. 
(vi) As per treatments.
(vii) Irrigated. (viii) 9 weedings and interculture operations and 1 earthing. (ix) and (x) N.A.

2. TREATMENTS:
Main-plot treatments:
2 seasons of planting: D1—Autumn (October-November) and D2—Spring (February).

Sub-plot treatments:

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication : 10 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 55'×28'. (b) 49'×21'. (v) 3'×3.3'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(a) 24.53 tons/ac. (b) (a) 2.89 tons/ac. (b) 2.50 tons/ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.
Crop : Sugarcane.
Site : Indian Inst. of Sugarcane Res., Lucknow. Type = 'CV'.

Object : To study the effect of different seasons of planting on different varieties of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Sandy loam. (c) N.A. (ii) (a) N.A. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) As per treatments. (iv) (a) 2 ploughings, 3 harrowings and 1 planking. (b) N.A. (iii) 57 setts (3 budded)/row. (D) Rows at 3 ft apart. (e) N.A. (v) 40 lb./ac. of N as G.M. (sawan) + 30 lb./ac. of N as G.N.C. + 80 lb./ac. of N as A/S + 30 lb./ac. of P2O5 as Super. (VI) As per treatments. (vii) Irrigated. (viii) 8 intercultures and weeding. (ix) N.A. (x) 20 to 27.2.1958.

2. TREATMENTS:
   Main-plot treatments : 2 seasons of planting: D1 = Autumn (October-November) and D2 = Spring (February).
   Sub-plot treatments :

3. DESIGN :
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 10 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 55'x24'. (b) 49'x17'. (v) 3'x3.5'. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
   (i) 16.63 tons/ac. (ii) 4.01 tons/ac. (b) 2.96 tons/ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
<th>V8</th>
<th>V9</th>
<th>V10</th>
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<tbody>
<tr>
<td>D1</td>
<td>14.85</td>
<td>27.06</td>
<td>16.72</td>
<td>12.07</td>
<td>20.42</td>
<td>17.76</td>
<td>14.38</td>
<td>19.67</td>
<td>19.34</td>
<td>14.66</td>
<td>17.69</td>
</tr>
<tr>
<td>D2</td>
<td>13.25</td>
<td>18.91</td>
<td>15.89</td>
<td>12.21</td>
<td>14.24</td>
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<td>15.77</td>
<td>20.96</td>
<td>12.88</td>
<td>15.56</td>
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<tr>
<td>Mean</td>
<td>14.05</td>
<td>22.98</td>
<td>16.30</td>
<td>12.14</td>
<td>17.33</td>
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<td>15.08</td>
<td>17.72</td>
<td>20.15</td>
<td>13.77</td>
<td>16.63</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means
2. V marginal means
3. V means at the same level of D
4. D means at the same level of V
Crop :- Sugarcane.  
Site :- Indian Instt. of Sugarcane Res., Lucknow.  
Type :- 'CV'.

Object:-To study the effect of different seasons of planting on different varieties of Sugarcane.

1. BASAL CONDITIONS:

(i) to (c) N.A.  
(ii) Loamy soil.  
(iii) As per treatments.  
(iv) (a) and (b) N.A.  
(c) 3,500 cuttings.  
(d) 4 rows, 10 ft. apart.  
(e) N.A.  
(v) N.A.  
(vi) As per treatments.  
(vii) Irrigated.  
(viii) N.A.  
(ix) 56.4°.  

2. TREATMENTS:

Main-plot treatments:

2 seasons of planting: D_1 = Autumn (October-November) and D_2 = Spring (February).

Sub-plot treatments:

6 varieties: V_1 = CO. 343 (late), V_2 = CO. 527 (early), V_3 = CO. 969 (late), V_4 = CO. 976 (early), V_5 = CO. 997 (early) and V_6 = CO. 1111 (late).

3. DESIGN:

(i) Split-plot.  
(ii) 2 main-plots/replication; 6 sub-plots/main-plot.  
(b) N.A.  
(iii) 4 x 4.  
(iv) (a) 55 x 15'.  
(b) 49 x 15'.  
(v) 3' at each end of the plot.  
(vi) Yes.

4. GENERAL:

(i) and (ii) N.A.  
(iii) Germination %, shoot counts, millable cane, juice analysis and sugarcane yield.  
(iv) (a) 1955—N.A.  
(b) No.  
(c) Nil.  
(v) to (vii) Nil.

5. RESULTS:

(i) 29.65 tons/ac.  
(ii) No.  
(iii) 3.54 tons/ac.  
(iv) 3.07 tons/ac.  
(v) Main effect of V alone is highly significant.  
(vi) As. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>V_1</th>
<th>V_2</th>
<th>V_3</th>
<th>V_4</th>
<th>V_5</th>
<th>V_6</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>30.14</td>
<td>30.35</td>
<td>30.90</td>
<td>32.71</td>
<td>20.01</td>
<td>37.09</td>
<td>30.20</td>
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<td>31.25</td>
<td>31.17</td>
<td>29.95</td>
<td>32.90</td>
<td>17.13</td>
<td>32.19</td>
<td>29.10</td>
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<tr>
<td>Mean</td>
<td>30.70</td>
<td>30.76</td>
<td>30.42</td>
<td>32.80</td>
<td>18.57</td>
<td>34.64</td>
</tr>
</tbody>
</table>

S.E. of difference of two:

1. D marginal means = 1.02 tons/ac.
2. V marginal means = 1.54 tons/ac.
3. V means at the same level of D = 2.17 tons/ac.
4. D means at the same level of V = 2.23 tons/ac.

---

Crop :- Sugarcane.  
Site :- Indian Instt. of Sugarcane Res., Lucknow.  
Type :- 'CV'.

Object:-To study the effect of different spacings on different varieties of Sugarcane.

1. BASAL CONDITIONS:

(i) N.A.  
(ii) Sandy loam.  
(iii) As per treatments.  
(iv) (a) and (b) sandy loam.  
(c) Refer soil analysis, I.I.S.R., Lucknow.  
(v) 23 and 24.2.1956.  
(vi) (a) 1 ploughing, 4 harrowings and 4 plankings.  
(b) N.A.  
(c) and (d) As per treatments.  
(e) N.A.  
(v) 150 lb/ac. of N as super/G.M., G.N.C. and A/S.  
(vi) As per treatments.  
(vii) Irrigated.  
(viii) 6 weedings and interculture operations.  
(ix) N.A.  
(x) March 31, 1957 to April 2, 1957.
2. TREATMENTS:

Main-plot treatments:

4 cultural treatments: 
- $C_1=$ Rows $21'$ apart with 143 buds/row, 
- $C_2=$ Rows $3'$ apart with 177 buds/row, 
- $C_a=$ Rows $3'1:$ apart with 199 buds/row and 
- $C_b=$ Rows $4'$ apart with 227 buds/row.

Sub-plot treatments:

3 varieties: $V_1=CO.453$, $V_2=CO.617$ and $V_3=CO.513$.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $55' \times 28'$. 
(b) 1/3.76 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1956—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 22.48 tons/ac. (ii) (a) 2.31 tons/ac. (b) 2.20 tons/ac. (iii) Main effect of $V$ alone is highly significant. 
(iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>$C_1$</th>
<th>$C_2$</th>
<th>$C_3$</th>
<th>$C_4$</th>
<th>Mean</th>
</tr>
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<td>25.94</td>
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<td>26.24</td>
</tr>
<tr>
<td>$V_3$</td>
<td>20.66</td>
<td>21.64</td>
<td>20.53</td>
<td>20.74</td>
<td>20.89</td>
</tr>
</tbody>
</table>

Mean 22.59 22.07 23.11 22.15 22.48

S.E. of difference of two

1. C marginal means = 0.94 tons/ac.
2. V marginal means = 0.78 tons/ac.
3. V means at the same level of C = 1.56 tons/ac.
4. C means at the same level of V = 1.58 tons/ac.

Crop: Sugarcane. 
Ref: I.I.S.R. 57(335).

Site: Indian Instt. of Sugarcane Res, Lucknow. Type = ‘CV’.

Object:—To study the effect of different spacings on different varieties of Sugarcane.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Somei (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 18.2.1957. (iv) (a) 1 ploughing, 3 harrowings and 4 plankings. (b) N.A. (c) and (d) As per treatments. (e) N.A. (vi) 150 lb/ac. of N+50 lb/ac. of P₂O₅. (vii) As per treatments. (viii) 3 intercultures, 3 weedicings and 3 earthings. (ix) N.A. (x) 13 to 20.12.1957.

2. TREATMENTS to 4. GENERAL:

Same as in exp. no. 56(355) on page 133.

5. RESULTS:

(i) 16.09 tons/ac. (ii) (a) 6.97 tons/ac. (b) 4.08 tons/ac. (iii) Main effect of $V$ alone is highly significant. 
(iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>$C_1$</th>
<th>$C_2$</th>
<th>$C_3$</th>
<th>$C_4$</th>
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<td>11.57</td>
<td>9.57</td>
<td>10.88</td>
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</table>

Mean 16.85 15.85 16.08 15.59 16.09
Crop: Sugarcane.  
Site: Indian Instt. of Sugarcane Res., Lucknow.  
Type: ‘CV’.

Object: To study the effect of chemical treatments of setts and different times of planting on different varieties of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) As per treatments. (iv) (a) 1 ploughing and 2 harrowings by tractor. (b) N.A. (c) 301 setts (3 budded) per plot. (d) Rows 2’ apart. (e) N.A. (v) 150 lb./ac. of N as N/S and G.N.C in 2:1 ratio + 50 lb./ac. of P2O5 as Super. (vi) As per treatments. (vii) Irrigated. (viii) 12 weedings and interculture operations. (ix) N.A. (x) 4 to 8.1.1957.

2. TREATMENTS:
   Main plot treatments:
   All combinations of (i) and (ii)
   (i) 2 times of planting: D1 = Autumn (November) and D2 = Spring (February).
   (ii) 2 varieties: V1 = Co. 617 and V2 = Co. 527.

   Sub-plot treatments:
   5 sett treatments: S0 = Control (no sett treatment), S1 = Abvit solution (1 lb. in 20 gallons of water), S2 = Agallo! solution (1 lb. in 20 gallons of water), S3 = Aretan solution (1 lb. in 40 gallons of water) and S4 = 10% molasses solution after neutralising with lime.

   Sets dipped in the solution in case of S1, S2 and S3 and soaked for 8 hours in case of S4.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 41’ x 24’. (b) 35’ x 17’. (v) 3’ x 3.5’. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 23.74 tons/ac. (ii) 5.55 tons/ac. (b) 2.54 tons/ac. (iii) Main effect of V alone is highly significant.
   (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>Mean</th>
<th>V1</th>
<th>V2</th>
</tr>
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<tbody>
<tr>
<td>24.56</td>
<td>23.84</td>
<td>23.04</td>
<td>23.32</td>
<td>24.17</td>
<td>23.74</td>
<td>19.50</td>
<td>28.08</td>
</tr>
<tr>
<td>22.59</td>
<td>21.41</td>
<td>23.36</td>
<td>28.88</td>
<td>25.20</td>
<td>23.69</td>
<td>19.60</td>
<td>27.77</td>
</tr>
<tr>
<td>Mean</td>
<td>23.58</td>
<td>23.62</td>
<td>23.20</td>
<td>23.60</td>
<td>24.69</td>
<td>23.74</td>
<td>19.55</td>
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</table>

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.31</td>
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</tr>
<tr>
<td>28.84</td>
<td>28.23</td>
<td>27.01</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D or V marginal means
2. S marginal means
3. Means at the same level of D or V
4. D or V means at the same level of S
S.E. of body of D x V table

1.24 tons/ac.  
0.93 tons/ac.  
1.27 tons/ac.  
1.68 tons/ac.  
1.24 tons/ac.  

Site: Indian Instt. of Sugarcane Res., Lucknow. Type: 'CG'.

Object: To study the effect of chemical treatments of setts and different times of planting on different varieties of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (b) Sandy loam. (b) Refer soil analysis I.I.S.R., Lucknow. (iii) As per treatments.
   (iv) (a) 1 ploughing by bullocks and 2 harrowings by disc. (b) N.A. (c) 342 setts (3 budded)/plot. (d) Rows 3' apart. (e) N.A. (v) 150 lb./ac. of N & 50 lb./ac. of P2O5. (vi) As per treatments. (vii) Irrigated. (viii) 8 weedings and interculture operations. (ix) N.A. (x) 14 to 21.12.1957.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 2 times of planting: D1 = Autumn (November) and D2 = Spring (February).
   (2) 2 varieties: V1 = CO 617 and V2 = CO 527.
   Sub-plots treatments:
   6 sett treatments: S0 = Control (fresh setts unsoaked), S1 = 10% solution of A/S, S2 = 10% solution of Super, S3 = 10% solution of A/S + Super (50:50), S4 = 0.25% solution of lime and S5 = Water.
   Sets soaked for 6 hours in the solutions. The solution in case of S1, S2 and S3 was neutralised with lime.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 25' x 21'. (b) 49' x 14'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 13.97 tons/ac. (ii) (a) 3.98 tos/ac. (b) 2.68 tons/ac. (iii) Main effects of V and S are highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
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<td>16.63</td>
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</table>

S.E. of difference of two
1. D or V marginal means = 0.94 tons/ac.
2. S marginal means = 1.09 tons/ac.
3. S means at the same level of D or V = 1.55 tons/ac.
4. D or V means at the same level of S = 1.09 tons/ac.

Site: Indian Instt. of Sugarcane Res., Lucknow. Type: 'CM'.

Object: To study the effect of different levels of N, P and crop rotations on Sugarcane crop.
1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) N.A.
   (ii) (a) Sandy loam. (b) Refer soil analysis I.I.S.R., Lucknow.
   (iii) 16 and 17.2.1955. (iv) (a) and (b) N.A.
   (v) 57 sets (3 budded)/row. (d) Rows at 3' apart. (e) N.A.
   (vi) N.A. (vii) 453. (viii) Irrigated. (viii) and (ix) N.A.
   (x) 17.2.1956 to 3.3.1956.

2. TREATMENTS:
   Main-plot treatments:
   2 crop rotations:
   \[ S_1 = \text{Sanai (G.M.)-Wheat-Sanai (G.M.)-Sugarcane} \]
   \[ S_2 = \text{Sanai (G.M.)-Wheat-Fallow-Sugarcane} \]

   Sub-plot treatments:
   All combinations of (1) and (2).
   (1) 4 levels of N as A/S: \[ N_0=0, N_1=100, N_2=150 \text{ and } N_3=200 \text{ lb./ac.} \]
   (2) 3 levels of P as Super: \[ P_0=0, P_1=100 \text{ and } P_2=200 \text{ lb./ac.} \]
   All combinations of A/S and Super applied as top dressing.

3. DESIGN:
   (i) Split-plot. (ii) 2 main-plots replication; 12 sub-plots/main-plot.
   (iii) 5'x21'. (iv) 3'x33'. (v) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Yield of sugarcane. (iv) 1955—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 20.24 tons/ac. (ii) 11.24 tons/ac. (b) 3.62 tons/ac. (iii) Only main effect of N is highly significant.
   (iv) Average yield of sugarcane in tons/ac.

   \[
   \begin{array}{cccc|ccc}
   \hline
   & N_0 & N_1 & N_2 & N_3 & P_0 & P_1 & P_2 \\
   \hline
   S_1 & 19.08 & 25.22 & 28.61 & 27.90 & 25.20 & 24.48 & 23.32 & 26.81 \\
   S_2 & 21.24 & 30.25 & 28.82 & 29.24 & 27.38 & 26.36 & 27.88 & 27.91 \\
   \text{Mean} & 20.16 & 27.73 & 28.71 & 28.57 & 26.29 & 25.42 & 26.10 & 27.36 \\
   \hline
   P_0 & 18.16 & 26.55 & 27.64 & 29.34 & & & & \\
   P_1 & 20.56 & 27.88 & 28.49 & 27.48 & & & & \\
   P_2 & 21.81 & 28.76 & 30.00 & 28.89 & & & & \\
   \hline
   \end{array}
   \]

   S.E. of difference of two
   1. S marginal means = 2.65 tons/ac. 2. S means at the same level of N = 2.03 tons/ac.
   3. N marginal means = 1.21 tons/ac. 3. P means at the same level of S = 1.48 tons/ac.
   4. P marginal means = 1.05 tons/ac. 7. S means at the same level of P = 1.48 tons/ac.
   5. N means at the same level of S = 1.71 tons/ac. S.E. of body of N \times P table

Object: To study the effect of different levels of N, P and crop rotations on Sugarcane crop.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis I.I.S.R., Lucknow.
   (iii) 10 and 11.2.1956. (iv) (a) 4 harrowings, 1 ploughing and 5 plankings. (b) N.A. (c) 57 sets (3 budded)/row.
   (d) 3' between rows. (b) N.A. (v) N.A. (vi) 453. (vii) Irrigated. (viii) 7 intercultures and weeding operations. (ix) and (a) N.A.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 55(311) on page 116.
5. RESULTS:

(i) 23.52 tons/acre.  (ii) (a) 2.88 tons/acre.  (b) 2.53 tons/acre.  (iii) Main effect of N is highly significant. Main effect of P and interaction N x P is significant.  (iv) Av. yield of sugarcane in tons/acre.

<table>
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<tr>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
<th>P2</th>
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<td>23.81</td>
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<td>24.17</td>
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</table>

S.E. of difference of two

1. S marginal means = 0.68 tons/acre.  2. N marginal means = 0.84 tons/acre.  3. P marginal means = 0.73 tons/acre.  4. N means at the same level of S = 1.19 tons/acre.


Object: To study the effect of different levels of N, P and crop rotations on Sugarcane crop.

1. BASAL CONDITIONS:

(i) (a) and (b) As per treatments.  (c) N.A.  (ii) (a) Sandy loam.  (b) Refer soil analysis; I.I.S.R., Lucknow.  (iii) 1 and 2.2.1957.  (iv) (a) 1 ploughing and 2 harrowings by tractor.  (b) Rows 312 apart.  (c) N.A.  (v) N.A.  (vi) CO. 453.  (vii) Irrigated.  (viii) 6 interculture and weeding operations.  (ix) and (x) N.A.

2. TREATMENTS to 4. GENERAL:

Same as in exp. no. 55(331) on page 136.

5. RESULTS:

(i) 19.81 tons/acre.  (ii) (a) 3.92 tons/acre.  (b) 2.59 tons/acre.  (iii) Main effect of N is highly significant and effect of P is significant.  (iv) Av. yield of sugarcane in tons/acre.

<table>
<thead>
<tr>
<th>N0</th>
<th>N1</th>
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<th>N3</th>
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</table>

S.E. of difference of two

1. S marginal means = 0.92 tons/acre.  2. N marginal means = 0.86 tons/acre.  3. P marginal means = 0.75 tons/acre.  4. N means at the same level of S = 1.22 tons/acre.  S.E. of body of N x P table = 1.06 tons/acre.
Crop: - Sugarcane.  
Ref: - I.I.S.R. 58(381).

Type: - 'CM'.

Object: — To study the effect of different levels of N, P and crop rotation on Sugarcane yield.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments.  
   (c) N.A.  
   (ii) Sandy loam.  
   (b) Refer soil analysis, I.I.S.R., Lucknow.  
   (iii) 7.2.1958.  
   (iv) (a) and (b) N.A.  
   (v) 57 sets (3 budded)/row.  
   (d) Rows 3' apart.  
   (e) N.A.  
   (vi) CO. 451.  
   (vii) Irrigated.  
   (viii) and (ix) N.A.  
   (x) 2 and 3.3.1959.

2. TREATMENTS:
   Same as in exp. no. 55(331) on page 136.

5. RESULTS:
   (i) 23.42 tons/ac.  
   (ii) (a) 4.11 tons/ac.  
   (b) 2.51 tons/ac.  
   (iii) Main effect of N and interaction S×N are highly significant.  
   (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
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<th>N2</th>
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</tbody>
</table>

S.E. of difference of two
1. S marginal means = 0.97 tons/ac.  
2. N marginal means = 0.84 tons/ac.  
3. P marginal means = 0.72 tons/ac.  
4. N means at the same level of S = 1.18 tons/ac.  
5. S means at the same level of N = 1.41 tons/ac.  
6. P means at the same level of S = 1.02 tons/ac.  
7. S means at the same level of P = 1.28 tons/ac.  

—

Crop: - Sugarcane.  
Ref: - I.I.S.R. 59(314).

Type: - 'CM'.

Object: — To study the effect of different levels of N and different seasons of planting on Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  
   (ii) Sandy loam.  
   (b) Refer soil analysis, I.I.S.R., Lucknow.  
   (iii) As per treatments.  
   (iv) and (v) N.A.  
   (vi) CO. S510.  
   (vii) Irrigated.  
   (viii) to (x) N.A.

2. TREATMENTS:
   Main-plot treatments:  
   2 seasons of planting:  
   D1 = Autumn (4.11.1958) and D2 = Spring (11.2.1959).

   Sub-plot treatments:  
   6 levels of N:  
   N0 = 0, N1 = 60, N2 = 120, N3 = 180, N4 = 240 and N5 = 300 lb/ac.

3. DESIGN:
   (i) Split-plot.  
   (ii) 2 main-plots/replication; 6 sub-plots/main-plot.  
   (b) N.A.  
   (iii) 5.  
   (iv) (a) 55' × 24',  
   (b) 49' × 18'.  
   (v) 3' × 3'.  
   (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A.  
   (iii) Yield of sugarcane.  
   (iv) (a) 1959—N.A.  
   (b) N.A.  
   (c) Nil.  
   (v) to (vii) Nil.
5. RESULTS:

(i) 22.15 tons/ac. (ii) (a) 2.20 tons/ac. (b) 1.66 tons/ac. (iii) Main effect of D alone is highly significant.
(iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
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<td>23.09</td>
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S.E. of difference of two
1. D marginal means = 0.57 tons/ac.
2. N marginal means = 0.74 tons/ac.
3. N means at the same level of D = 1.05 tons/ac.
4. D means at the same level of N = 1.11 tons/ac.

---

Crop :- Sugarcane.
Site :- Indian Instt. of Sugarcane Res., Lucknow.
Object :- To study the effect of different levels of N and irrigation on different varieties of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Sanai. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 16 to 18.2.1956. (iv) (a) 2 ploughings, 3 harrowings and 5 plankings. (b) N.A. (c) 342 setts (3 budded/plot. (d) Row 3' apart. (e) N.A. (v) G.M. (sanai). (vi) and (vii) As per treatments. (viii) 2 weedings and 5 intercultures. (ix) N.A. (x) 9.3.1957 to 1.4.1957.

2. TREATMENTS:
Main-plot treatments :
All combinations of (I) and (2)
(I) 2 levels of N : N₁ =100 and N₂ =200 lb/ac.
(2) 2 levels of irrigation : I₁ =2 irrigations at 20 days interval during premonsoon period and I₂ = 4 irrigations at 10 days interval during premonsoon period.

Sub-plot treatments:

3. DESIGN :
(i) Split-plot. (ii) (a) 4 main-plots/replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 55'×18'. (b) 49'×12'. (c) 3'×3'. (v) Yes.

4. GENERAL :
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 28.89 tons/ac. (ii) (a) 7.46 tons/ac. (b) 11.82 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
<th>V₆</th>
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</table>
S.E. of difference of two
1. I or N marginal means = 1.52 tons/ac.
2. V marginal means = 4.83 tons/ac.
3. V means at the same level of I or N = 6.82 tons/ac.
4. I or N means at the same level of V = 6.56 tons/ac.
S.E. of body of I x N table = 1.52 tons/ac.

Site :- Indian Instt. of Sugarcane Res., Lucknow.  Type :- '9MV'.

Object :- To study the effect of different levels of N and irrigation on different varieties of Sugarcane.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Sandy loam. (c) N.A. (ii) (a) Ref. soil analysis, I.I.S.R., Lucknow. (iii) 24.1.1951. (iv) (a) and (b) N.A. (c) 43 sets (3 budded) row. (d) Rows 3' apart. (e) N.A. (v) G.M. (docious). (vi) and (vii) As per treatments. (viii) and (ix) N.A. (x) 17.2.1959 to 8.4.1959.

2. TREATMENTS :
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 4 levels of N : N0 = 25. N1 = 50. N2 = 100. N3 = 150 and N4 = 200 lb./ac.
   (2) 2 intervals of irrigation : I1 = 10 and I2 = 20 days.
   Sub-plot treatments:

3. DESIGN :
   (i) Split-plot. (ii) (a) 8 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 44' X 21'. (b) 35' X 13'. (v) 4.5' X 5'. (vi) Yes.

4. GENERAL :
   (i) and (iii) N.A. (ii) Yield of sugarcane. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
   (i) 25.70 tons/ac. (ii) 8.80 tons/ac. (iii) 8.99 tons/ac. (iii) Main effect of V alone is significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
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<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
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<td>30.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V3</td>
<td>23.74</td>
<td>27.74</td>
<td>28.43</td>
<td>31.93</td>
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<tr>
<td>V4</td>
<td>23.13</td>
<td>22.05</td>
<td>23.81</td>
<td>22.60</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 2.54 tons/ac. 5. N means at the same level of V = 5.16 tons/ac.
2. I marginal means = 1.80 tons/ac. 6. V means at the same level of I = 3.67 tons/ac.
3. V marginal means = 2.60 tons/ac. 7. I means at the same level of V = 3.65 tons/ac.
4. V means at the same level of N = 5.19 tons/ac. S.E. of body of N x T table = 2.54 tons/ac.
Crop: Sugarcane.  
Ref: I.I.S.R. 59(410).  
Type: 'IMV'.

Object: To study the effect of different levels of N and irrigation on different varieties of Sugarcane.

1. **BASAL CONDITIONS**:  
   (i) (a) N.A.  
   (b) Sanai.  
   (c) N.A.  
   (ii) (a) Study lot n.  
   (b) Refer soil analysis, I.I.S.R., Lucknow.  
   (iii) 19 and 20.2.1955.  
   (iv) (a) and (b) N.A.  
   (c) 43 sets (3 budged)/plot.  
   (d) Rows 3' apart.  
   (e) N.A.  
   (f) G.M. (sanai).  
   (g) and (h) As per treatments.  
   (i) to (k) N.A.

2. **TREATMENTS**:  
   Same as in expt. no.59(380) on page 141.

3. **DESIGN**:  
   (i) Split-plot.  
   (ii) (a) 8 main-plots/replication; 4 sub-plots/main-plot.  
   (b) N.A.  
   (iii) 3.  
   (iv) (a) 41' x 21'.  
   (b) 35' x 15'.  
   (v) 3' x 3'.  
   (vi) Yes.

4. **GENERAL**:  
   (i) and (ii) N.A.  
   (iii) Yield of sugarcane.  
   (iv) (a) 1956—N.A.  
   (b) No.  
   (c) Nil.  
   (v) to (vii) Nil.

5. **RESULTS**:  
   (i) 21.27 tons/ac.  
   (ii) (a) 24 tons/ac.  
   (b) 3.00 tons/ac.  
   (iii) Main effect of V is highly significant and that of I is significant.  
   (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&lt;sub&gt;3&lt;/sub&gt;</th>
<th>N&lt;sub&gt;4&lt;/sub&gt;</th>
<th>Mean</th>
<th>V&lt;sub&gt;1&lt;/sub&gt;</th>
<th>V&lt;sub&gt;2&lt;/sub&gt;</th>
<th>V&lt;sub&gt;3&lt;/sub&gt;</th>
<th>V&lt;sub&gt;4&lt;/sub&gt;</th>
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<td>27.33</td>
<td>23.45</td>
<td>23.16</td>
<td>25.56</td>
<td>25.41</td>
<td>19.67</td>
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<td>Mean</td>
<td>18.04</td>
<td>19.69</td>
<td>23.94</td>
<td>23.41</td>
<td>21.27</td>
<td>20.64</td>
<td>23.16</td>
<td>23.31</td>
<td>17.96</td>
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<td>18.26</td>
<td>18.13</td>
<td>22.36</td>
<td>23.82</td>
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<td></td>
</tr>
<tr>
<td>V&lt;sub&gt;2&lt;/sub&gt;</td>
<td>20.79</td>
<td>21.54</td>
<td>26.61</td>
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<tr>
<td>V&lt;sub&gt;3&lt;/sub&gt;</td>
<td>19.38</td>
<td>20.76</td>
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<tr>
<td>V&lt;sub&gt;4&lt;/sub&gt;</td>
<td>13.74</td>
<td>18.33</td>
<td>20.12</td>
<td>19.66</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 2.38 tons/ac.  
2. I marginal means = 1.58 tons/ac.  
3. V marginal means = 1.08 tons/ac.  
4. V means at the same level of N = 1.73 tons/ac.  
5. N means at the same level of V = 2.81 tons/ac.  
6. V means at the same level of I = 1.22 tons/ac.  
7. I means at the same level of V = 1.99 tons/ac.

---

Crop: Sugarcane.  
Type: 'JCM'.

Object: To study the effect of different levels of N, irrigation and different methods of planting on Sugarcane.

1. **BASAL CONDITIONS**:  
   (i) (a) N.A.  
   (b) Sanai.  
   (c) N.A.  
   (ii) (a) Study lot n.  
   (b) Refer soil analysis, I.I.S.R., Lucknow.  
   (iii) 19 to 23.2.1955.  
   (iv) (a) N.A.  
   (b) As per treatments.  
   (c) 522 sets (3 budged)/plot.  
   (d) Rows 3' apart.  
   (e) N.A.  
   (f) G.M. (sanai).  
   (g) As per treatments.  
   (h) Nil.  
   (i) to (k) N.A.  
   (l) to (m) 17.2.1956 to 3.3.1956.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2)
(1) 2 levels of irrigation: 1 = Normal irrigation at 80,000 gallons/ac. and 2 = Low irrigation at 20,000 gallons/ac.
(2) 2 methods of irrigation: M1 = Spray and M2 = Fitted irrigation.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 methods of planting: T1 = Trench planting and T2 = Flat planting.
(2) 2 levels of N: N1 = 100 and N2 = 200 lb/ac.

3. DESIGN:
(i) Split-plot. (ii) 4 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 6. (v) 56'x31'. (v) Y x 3.5'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) [a] 1955—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 23.58 tons/ac. (ii) (a) 2.90 tons/ac. (b) 3.26 tons/ac. (iii) Main effect of I is significant and that of N is highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>M1</th>
<th>M2</th>
<th>N1</th>
<th>N2</th>
<th>T1</th>
<th>T2</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>24.02</td>
<td>24.52</td>
<td>22.83</td>
<td>25.70</td>
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<tr>
<td>2</td>
<td>22.48</td>
<td>23.10</td>
<td>21.29</td>
<td>24.48</td>
<td>22.11</td>
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<tr>
<td>Mean</td>
<td>23.25</td>
<td>23.91</td>
<td>22.66</td>
<td>23.09</td>
<td>23.08</td>
<td>24.08</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. I or M marginal means = 0.29 tons/ac.
2. T or N marginal means = 0.67 tons/ac.
3. T or N means at the same level of I or M = 0.94 tons/ac.
4. I or M means at the same level of T or N = 0.89 tons/ac.
S.E. of body of I x M table = 0.19 tons/ac.
S.E. of body of T x N table = 0.67 tons/ac.

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Site: Indian Inst. of Sugarcane Res., Lucknow.  Type: 'ICM'.

Object: To study the effect of different levels of N, irrigation and different methods of planting on Sugarcane.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Sandy. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 4 and 5.3.1956. (iv) (a) N.A. (b) As per treatments. (c) N.A. (d) Rows 3' apart. (e) N.A. (v) G.M. (sand). (vi) CO. 617. (vii) As per treatments. (viii) and (ix) N.A. (x) 21.2.1957 to 29.3.1957.

2. TREATMENTS:
Same as in exp. no. 55(346) on page 142.
3. DESIGN:
(i) Split-plot. (ii) 4 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 49' x 18'.
(b) 49' x 21'. (v) 3' x 3.5'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 19'5-N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 23.38 tons/ac. (ii) 4.16 tons/ac. (b) 2.42 tons/ac. (iii) Main effect of N alone is highly significant.
(iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>N₁</th>
<th>N₂</th>
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<td>22.13</td>
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<td>20.33</td>
<td>22.75</td>
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<td>I₂</td>
<td>23.42</td>
<td>25.60</td>
<td>25.50</td>
<td>23.51</td>
<td>24.75</td>
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<td>T₁</td>
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<td>22.84</td>
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<tr>
<td>T₂</td>
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<td>23.32</td>
<td>24.83</td>
<td>31.21</td>
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<tr>
<td>N₁</td>
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<td>24.81</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N₂</td>
<td>21.14</td>
<td>22.91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. I or M marginal means = 1.20 tons/ac.
2. T or N marginal means = 0.70 tons/ac.
3. T or N means at the same level of I or M = 0.99 tons/ac.
4. I or M means at the same level of T or N = 1.39 tons/ac.
S.E. of body of 1xN table = 1.20 tons/ac.
S.E. of body of T x N table = 0.70 tons/ac.

Site: Indian Instt. of Sugarcane Res., Lucknow. Type: 'ICMV'.
Object: To study the effect of different levels of N, irrigation and different times of planting on different varieties of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Sandy. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) As per treatments. (iv) (a) and (b) N.A. (c) 342 setts (3 budded)/plot. (d) Rows 3' apart. (e) N.A. (f) G.M., (sand). (v) and (vi) As per treatments. (vii) and (viii) N.A. (ix) 27 to 30.1.1959.

2. TREATMENTS:
Main-plot treatments:
3 treatments: T₁=Autumn planting with usual irrigations, T₂=Autumn planting with 2 extra irrigations and T₃=Spring planting with usual irrigations.
Sub-plot treatments:
All combinations of (1) and (2)
(1) 3 levels of N: N₀=0, N₁=120 and N₂=180 lb./ac.
(2) 2 varieties: V₁=CO. 453 and V₂=CO. 527.

3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/replications; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 5' x 18'.
(b) 49' x 12'. (v) 3' x 3'. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A.  (iii) Yield of sugarcane.  (iv) (a) 1957—N.A.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
(i) 24.82 tons/ac.  (ii) 6.44 toas/ac.  5.16 tons/ac.  (iii) Main effect of V alone is highly significant.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>V₁</th>
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<td>T₁</td>
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<td>25.71</td>
<td>25.71</td>
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<td>T₂</td>
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<td>24.44</td>
<td>25.74</td>
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<td>24.27</td>
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<tr>
<td>T₃</td>
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<td>24.28</td>
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<tr>
<td>V₁</td>
<td>25.70</td>
<td>28.34</td>
<td>27.78</td>
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<tr>
<td>V₂</td>
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<td>21.76</td>
<td>22.42</td>
<td></td>
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</tbody>
</table>

S.E. of difference of two
1. T marginal means = 1.86 tons/ac.  5. T means at the same level of V = 2.38 tons/ac.
2. V marginal means = 1.22 tons/ac.  6. N means at the same level of T = 2.58 tons/ac.
3. N marginal means = 1.49 tons/ac.  7. T means at the same level of N = 2.81 tons/ac.
4. V means at the same level of T = 2.11 tons/ac.  S.E. of body of V × N table = 1.49 tons/ac.


Object: To control stem borer chilo nebulum by foliar spray application of insecticides on sugarcane.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Sandy loam.  (b) Refer soil analysis, I.I.S.R., Lucknow.  (iii) 12.3.1954.  (iv) (a) and (b) N.A.  (c) 55 sets (3 budded)/row.  (d) 3' between rows.  (e) N.A.  (f) N.A.  (g) CO. 313.  (h) Irrigated.  (vi) to (x) N.A.

2. TREATMENTS:
12 emulsion sprays: T₀ = Control (no spray), T₁ = DDT + BHC 1%, T₂ = BHC 0.25%, T₃ = Aldrin 0.1%, T₄ = Chlordane 1%, T₅ = Dieldrin 0.1%, T₆ = Endrin 0.1%, T₇ = Endrin 0.1%, T₈ = Folidol 1%, T₉ = Pothane 0.1%, T₁₀ = Tospherase 0.1% and T₁₁ = Malathion 0.1%.
1st spraying on 10.9.1954 and 2nd on 22.10.1954 with hatching of eggs in the field.

3. DESIGN:
(i) R.B.D.  (ii) (a) 12.  (b) N.A.  (iii) 3.  (iv) (a) and (b) 55' × 33'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) Stem borer attack.  (iii) % of stem bored cases.  (iv) 1954—contd.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
(i) 40.17 degrees.  (ii) 13.23 degrees.  (iii) Treatment differences are not significant.  (iv) Mean % of stem bored cases in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
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<tbody>
<tr>
<td>Mean angle</td>
<td>44.14</td>
<td>39.91</td>
<td>34.64</td>
<td>40.68</td>
<td>56.14</td>
<td>41.22</td>
</tr>
</tbody>
</table>

Transformed back % = 48.51  41.07  32.49  42.55  68.76  45.49
Object: To control stem borer chilotsra auricula Ddgn. by foliar spray application of insecticides on Sugarcane.

1. BASAL CONDITIONS:
(a) To (c) N.A. (b) Sandy loam. (c) Refer soil analysis, I.I.S.R., Lucknow. (d) 17.2.1955 (e) rows 3' apart. (f) N.A. (g) CO. 313. (h) Irrigated. (i) to (x) N.A.

2. TREATMENTS:
12 insecticidal treatments: T0 = Control (no application), T1 = BHC 1% suspension spray, T2 = Chlordane 0.5% emulsion spray, T3 = Dieldrin 5 oz./ac., T4 = Toxaphene 0.1% emulsion spray, T5 = Endrin 0.1% emulsion spray, T6 = Folidol 0.1% emulsion spray, T7 = Parathion 0.05% suspension spray, T8 = Ryania 40% dust, T9 = Toxaphene 10% dust, T10 = DDT 0.1% emulsion spray and T11 = BHC 0.25% emulsion spray.

3. DESIGN:
(a) R.B.D. (b) 12. (c) N.A. (d) 3. (e) a) and (b) 55' x 35'. (f) N.A. (g) Nil. (h) Yes.

4. GENERAL:
(a) Stem borer attack. (b) Incidence of stem borer. (c) 1954—contd. (d) No. (e) Nil. (f) to (vii) Nil.

5. RESULTS:
(a) 36.48 degrees. (b) 6.79 degrees. (c) Treatment differences are not significant. (d) Av. % incidence of stem borer in degrees.

Site: Indian Instt. of Sugarcane Res., Lucknow. Type: 'D'.

Object: To control stem borer chilotsra auricula Ddgn. by foliar spray application of spray of insecticides in Sugarcane.
1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 14 and 17.2.1956.
   (iv) (a) and (b) N.A. (c) 8 x 32 (3 budded) plot. (d) Rows 3' apart. (e) N.A. (v) N.A. (vi) CO. 527.
   (vii) Irrigated. (viii) to (b) N.A.

2. TREATMENTS:
   6 emulsion sprays: T₀ = Control (no spray), T₁ = Endrin 0.1%, T₂ = DDT 0.1%, T₃ = Toxaphene 0.1%, T₄ =
   Chlordane 0.5% and T₅ = BHC 0.5%.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) 55' x 33'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Stem borer attack. (iii) Yield of sugarcane and stem bored cane counts. (iv) (a) 1954—contd.
   (b) Nil. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   Sugarcane yield
   (i) 34.56 tons/ac. (ii) 4.12 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

   Treatment Av. yield T₀ T₁ T₂ T₃ T₄ T₅
   34.05 36.67 33.03 32.63 35.23 35.83
   S.E./mean = 1.03 tons/ac.

   Stem bored cane counts
   (i) 3.94. (ii) 0.87. (iii) Treatment differences are highly significant. (iv) Mean value of \( \sqrt{x} \) where \( x \) is the number of stem bored canes/plot.

   Treatment Mean value T₀ T₁ T₂ T₃ T₄ T₅
   4.76 2.37 3.85 4.51 4.39 3.77
   S.E./mean = 0.36

   Transformed back counts 21.66 5.62 14.82 20.34 19.27 14.21

---

Site = Indian Instt. of Sugarcane Res., Lucknow. Type = 'D'.
Object = To control stem borer Chlorotraea auricila Dgn. by foliar application of insecticides in Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 14 and 19.2.1957.
   (iv) (a) and (b) N.A. (c) 60 sets (3 budded) plot. (d) Rows 3' apart. (e) N.A. (f) N.A. (g) CO—527.
   (vii) Irriagated. (viii) to (b) N.A.

2. TREATMENTS:
   10 emulsion sprays: T₀ = Control (3 plots), T₁ = DDT 0.1% at 3 lb./hour. ac. actual, T₂ = DDT 0.25% at 2.5 lb./hour.
   ac. actual, T₃ = DDT 0.5% at 3 lb./hour. ac. actual, T₄ = Gamma BHC 0.5% at 5 lb./hour. ac. actual, T₅ =
   Gamma BHC 0.2% at 2 lb./hour. ac. actual, T₆ = Endrin 0.1% at 1 lb./hour. ac. actual, T₇ = Endrin 0.15% at 1.5 lb./hour.
   ac. actual, T₈ = Endrin 0.2% at 2 lb./hour. ac. actual.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) 55' x 13'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Stem borer attack. (iii) Yield of sugarcane and number of bored canes. (iv) (a) 1954—contd.
5. RESULTS:

Sugarcane yield

(i) 19.39 tons/ac.  (ii) 3.31 tons/ac.  (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>19.48</td>
<td>19.88</td>
<td>20.08</td>
<td>19.27</td>
<td>20.78</td>
<td>18.43</td>
<td>17.47</td>
<td>16.40</td>
</tr>
</tbody>
</table>

S.E. of T0 mean = 1.10 tons/ac.

Number of bored canes

(ii) 1261 cases/ac.  (iii) Treatment differences are not significant. (iv) Av. number of bored cases/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number</td>
<td>1320</td>
<td>1288</td>
<td>1168</td>
<td>1008</td>
<td>1104</td>
<td>928</td>
<td>1256</td>
<td>1208</td>
</tr>
</tbody>
</table>

S.E. of T0 mean = 23.86 cases/ac.

Crop :- Sugarcane.

Ref :- I.I.S.R. 54(282).

Site :- Indian Instt. of Sugarcane Res., Lucknow.  Type :- 'D'.

Object :- To study the control measures against termite in Sugarcane.

1. BASAL CONDITIONS :

(i) (a) to (c) N.A.  (ii) (a) Sandy loam.  (b) Refer soil analysis, I.I.S.R., Lucknow.  (iii) 15.3.1954.  (iv) (a) and (b) N.A.  (c) 55 sets (3 budded)/row.  (d) and (e) N.A.  (v) CO—313.  (vi) Irrigated.

(ii) to (x) N.A.

2. TREATMENTS :

8 dustings at 20 lb/ac.: T0=Control (no dusting), T1=BHC 5%, T2=Aldrin 2.5%, T3=Dieldrin 1.5%, T4=Chlordane 5%, T5=Folidoll 1.5%, T6=Parathion 1.0% and T7=Toxaphene 1.0%.

3. DESIGN :

(i) R.B.D.  (ii) S.  (b) N.A.  (iii) 3.  (iv) (a) and (b) 53'×21'.  (v) Nil.  (vi) Yes.

4. GENERAL :

(i) N.A.  (ii) Termite attack.  (iii) Percentage of termite incidence.  (iv) (a) 1954—contd.  (b) No.  (c) Nil.

(v) to (vii) Nil.

5. RESULTS :

(i) 39.06 degrees.  (ii) 5.73 degrees.  (iii) Treatment differences are not significant. (iv) Mean % of incidence of termite in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>44.26</td>
<td>42.86</td>
<td>36.15</td>
<td>39.09</td>
<td>35.38</td>
<td>41.36</td>
<td>36.69</td>
<td>36.68</td>
</tr>
</tbody>
</table>

S.E./mean = 3.31 degrees.

Transformed back % 48.73 46.31 34.95 39.86 33.68 43.73 35.84 35.82

Crop :- Sugarcane.


Site :- Indian Instt. of Sugarcane Res., Lucknow.  Type :- 'D'.

Object :- To study the control measures against termite in Sugarcane.
1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 24.2.1955. (iv) (a) and (b) N.A. (c) 60 sets (3 budded)/row. (d) Rows 3' apart. (e) N.A. (v) N.A. (vi) CO. 313. (vii) N.A. (viii) to (x) N.A.

2. TREATMENTS:
10 dusting treatments: T0=Control (no application), T1=BHC 5% at 20 lb./ac., T2=Aldrin 1% at 50 lb./ac., T3=Dieldrin 2.5% at 20 lb./ac., T4=Chlordane 1.5% at 20 lb./ac., T5=Chlordane 5% at 40 lb./ac., T6=Folfidol 1.5% at 20 lb./ac., T7=Parathion 1.0% at 20 lb./ac. and T8=Toxaphene 10.0% at 20 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) and (b) 55' x 31'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Termite attack. (iii) Incidence of termite. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(ii) 24.39 degrees. (ii) 6.72 degrees. (iii) Treatment differences are not significant. (iv) Mean % of incidence of termite in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>32.39</td>
<td>22.33</td>
<td>21.73</td>
<td>21.60</td>
<td>22.29</td>
<td>22.75</td>
<td>24.73</td>
<td>25.49</td>
<td>24.39</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>~ 3.88 degrees.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Transformed back % 28.91 14.79 14.07 14.91 14.75 15.90 17.81 18.82 17.38 19.72


Object: To study the control measures against termite on Sugarcane.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 5 and 6.3.1956. (iv) (a) and (b) N.A. (c) 50 sets (3 Budded)/row. (d) 3' between rows. (e) N.A. (f) N.A. (g) CO. 313. (h) Irrigated. (i) N.A. (j) N.A.

2. TREATMENTS:
9 insecticidal treatments: T0=Control, T1=BHC 5% dust at 20 lb./ac., T2=Aldrin 1% dust at 100 lb./ac., T3=Dieldrin 2.5% dust at 20 lb./ac., T4=Chlordane 5% dust at 20 lb./ac., T5=Chlordane 5% dust at 40 lb./ac., T6=Parathion 0.25% BHC suspension, T7=Dipping the setts in 0.25% Dieldrin suspension and T8=Dipping the setts in 0.1% Chlordane emulsion.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) and (b) 55' x 33'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Termite attack. (iii) Yield of sugarcane and incidence of termite. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
Sugarcane yield
(i) 25.14 tons/ac. (ii) 1.42 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E./mean</td>
<td>~ 0.82 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Incidence of termite

(i) 9.27 degrees. (ii) 4.47 degrees. (iii) Treatment differences are significant. (iv) Mean % of incidence of termite in degrees.

Treatment | $\theta_0$ | $\theta_1$ | $\theta_2$ | $\theta_3$ | $\theta_4$ | $\theta_5$ | $\theta_6$ | $\theta_7$ | $\theta_8$ |
---|---|---|---|---|---|---|---|---|---|
Mean angle | 16.76 | 13.23 | 1.95 | 4.67 | 8.24 | 14.13 | 11.06 | 8.28 | 5.07 |
S.E./mean = 2.38 degrees.

Transformed back % | 8.74 | 5.68 | 0.62 | 1.15 | 2.53 | 6.40 | 4.14 | 2.56 | 1.27 |


Site: Indian Inst. of Sugarcane Res., Lucknow. Type: 'D'.

Object: To study the control measures against termite on Sugarcane.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 11 and 12.10.1957. (iv) (a) and (b) N.A. (c) 60 sets (3 budded)/row. (d) 3' between rows. (e) N.A. (f) N.A. (vi) CO. 313. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
12 insecticidal treatments: $T_0$ = Control (no application), $T_1$ = BHC at 20 lb./ac. of 5% dust, $T_2$ = Aldrin at 20 lb./ac. of 5% dust, $T_3$ = Chlordane at 20 lb./ac. of 5% dust, $T_4$ = Dipping the sett in 0.5% Agallool solution, $T_5$ = Dipping the sett in 0.5% Aretan solution, $T_6 = T_1 + T_4$, $T_7 = T_2 + T_4$, $T_8 = T_3 + T_4$, $T_9 = T_2 + T_5$, $T_{10} = T_3 + T_5$, and $T_{11} = BHC$ emulsion over sett at 1.13 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) 55' x 21'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Termite attack. (iii) Yield of sugarcane and incidence of termite. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Sugarcane yield
(i) 19.53 tons/ac. (ii) 3.34 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

| Treatment | $\theta_0$ | $\theta_1$ | $\theta_2$ | $\theta_3$ | $\theta_4$ | $\theta_5$ | $\theta_6$ | $\theta_7$ | $\theta_8$ |
---|---|---|---|---|---|---|---|---|---|
S.E./mean = 1.93 tons/ac.

Incidence of termite
(i) 20.60 degrees. (ii) 3.90 degrees. (iii) Treatment differences are significant. (iv) Mean % of incidence of termite in degrees.

| Treatment | $\theta_0$ | $\theta_1$ | $\theta_2$ | $\theta_3$ | $\theta_4$ | $\theta_5$ | $\theta_6$ | $\theta_7$ | $\theta_8$ |
---|---|---|---|---|---|---|---|---|---|
Mean angle | 24.08 | 22.00 | 20.10 | 22.35 | 23.25 | 20.48 | 26.86 |
| Treatment | $\theta_0$ | $\theta_1$ | $\theta_2$ | $\theta_3$ | $\theta_4$ | $\theta_5$ | $\theta_6$ | $\theta_7$ | $\theta_8$ |
---|---|---|---|---|---|---|---|---|---|
Mean angle | 15.86 | 14.02 | 23.37 | 18.37 | 20.85 | 19.33 |
Transformed back % | 7.89 | 6.32 | 16.07 | 10.33 | 12.44 | 11.34 |
S.E./mean = 2.25 degrees.
Crop : Sugarcane. 
Type : ‘D’.

Object : To study the control measures against termite on Sugarcane.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.   (ii) (a) Sandy loam.   (b) Refer soil analysis, I.I.S.R., Lucknow.   (iii) 14 and 15.2.1958.   (iv) (a) and (b) N.A.   (c) 60 sets (3 budded)/row.   (d) Rows 3’ apart.   (e) N.A.   (v) N.A.   (vi) CO. 443.   (vii) Irrigated.   (viii) to (x) N.A.

2. TREATMENTS :
   9 insecticidal treatments : T₀=Control (no application), T₁=1 lb./ac. of actual Chlordane 5% dust, T₂= Aretan 0.5% dip, T₃=Agallol 0.5%+Aldrin at 1 lb/ac., T₄=Agallol 0.5%+1 lb/ac. of BHC dust, T₅=Agallol 0.5%+T₆=T₇=1.25 lb/ac. of Gamma BHC emulsion and T₈=1.50 lb/ac. of Gamma BHC emulsion.

3. DESIGN :
   (i) R.B.D.   (ii) 9.   (iii) (a) 55’×33’.   (b) Nil.   (vi) Yes.

4. GENERAL :
   (i) N.A.   (ii) Termite attack.   (iii) Yield of sugarcane and incidence of termite.   (iv) (a) 1954—contd.   (b) Contd.   (c) Nil.   (v) to (vii) Nil.

5. RESULTS :
   Sugarcane yield
   (i) 12 lb tons/ac.   (ii) 4.56 tons/ac.   (iii) Treatment differences are not significant.   (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E./mean</td>
<td>2.28 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Incidence of termite
   (i) 21.54 degrees.   (ii) 5.89 degrees.   (iii) Treatment differences are not significant.   (iv) Mean % of incidence of termite in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>24.62</td>
<td>23.99</td>
<td>20.55</td>
<td>26.94</td>
<td>24.49</td>
<td>27.41</td>
<td>23.87</td>
<td>21.92</td>
<td>27.11</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>2.94 degrees.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Transformed back %
   17.68 16.86 12.71 20.82 17.54 21.50 16.72 14.29 21.07

Crop : Sugarcane. 
Ref : I.I.S.R. 54(283). 
Type : ‘D’.

Object : To study the effect of soil application of BHC against borers on Sugarcane in pre monsoon period.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.   (ii) (a) Sandy loam.   (b) Refer soil analysis, I.I.S.R., Lucknow.   (iii) to (v) N.A.   (vi) CO. 313.   (vii) Irrigated.   (viii) to (x) N.A.

2. TREATMENTS :
   3 dustings with 5% BHC : T₀=O, T₁=100 and T₂=150 lb./ac.

3. DESIGN :
   (i) R.B.D.   (ii) 3.   (b) N.A.   (iii) 5.   (iv) (a) and (b) 55’×33’.   (v) Nil.   (vi) Yes.
4. GENERAL:
   (i) N.A.  (ii) Attack of borer.  (iii) Yield of Sugarcane and number of dead hearts.  (iv) (a) and (b) N.A.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:

   Sugarcane yield
   (i) 20.86 tons/ac.  (ii) 2.24 tons/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of sugarcane in tons/ac.

   Treatment  T₀  T₁  T₂  T₃  T₄  T₅
   Av. yield  20.25 20.08 22.25

   S.E./mean = 1.00 tons/ac.

   Number of dead hearts
   (i) 5533 dead hearts/ac.  (ii) 1781 dead hearts/ac.  (iii) Treatment differences are not significant.  (iv) Av. number of dead hearts/ac.

   Treatment  T₀  T₁  T₂  T₃  T₄  T₅
   Av. number 5693 5736 5170

   S.E./mean = 796 dead hearts/ac.
1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Maize. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 25.0.1954 to 3.11.1954. (iv) and (v) N.A. (vi) CO, 617. (vii) Irrigated. (viii) and (ix) N.A.

2. TREATMENTS:
   7 sett soaking treatments: T0 = Control (no soaking), T1 = Abavit solution at 1 lb. in 20 gallons of water, T2 = Agalol solution at 1 lb. in 20 gallons of water, T3 = 10% solution of Molasses, T4 = 10% solution of A/S and Super, T5 = 10% solution of A/S and T6 = Water.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 55' x 24'. (b) 50' x 17'. (v) 3'. (vi) Nil. (vii) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 22.85 tons/ac. (ii) 4.28 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>22.69</td>
<td>24.34</td>
<td>24.44</td>
<td>20.31</td>
<td>24.44</td>
<td>20.28</td>
<td>23.12</td>
</tr>
</tbody>
</table>

S.E./mean = 1.75 tons/ac.

---

Crop: Sugarcane.  
Site: Indian Instt. of Sugarcane Res., Lucknow.  
Type: 'D'.

Object: To study the effect of foliar application of insecticides against shoot borer Chilotraea fusciata Snell.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 5 and 6.3.1956. (iv) (a) and (b) N.A. (c) 50 sets (3 budded)/row. (d) Rows 3' apart. (e) N.A. (v) N.A. (vi) CO, 313. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   9 spraying treatments: T0 = Control (no application), T1 = BHC 1.0%, T2 = Endrin 0.1%, T3 = Endrin 0.01%, T4 = Folidol 0.05%, T5 = Parathion 0.05%, T6 = BHC 0.25%, T7 = DDT 0.1% and T8 = Malathion 0.02%.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) and (b) 55' x 33'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Number of dead hearts and yield of sugarcane. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   Sugarcane yield
   (ii) 25.14 tons/ac. (iii) 1.42 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
</tr>
</thead>
</table>

S.E./mean = 0.82 tons/ac.
Number of dead hearts

(i) 8897 dead hearts/ac. (ii) 1727 dead hearts/ac. (iii) Treatment differences are highly significant. (iv) Av. number of dead hearts/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number</td>
<td>15488</td>
<td>5936</td>
<td>4128</td>
<td>8488</td>
<td>13352</td>
<td>9872</td>
<td>9536</td>
<td>6280</td>
<td>6992</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>996.9 dead hearts/ac.</td>
<td></td>
<td></td>
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</tbody>
</table>


Object:—To study the effect of foliar application of insecticides against borer Chilo tris infuscatellus and stem borer Chilo auriculata on Sugarcane.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 17.2.1955. (iv) and (v) N.A. (vi) CO.—527. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
12 insecticidal treatments: T0-Control (no spray), T1=BHC 1%, T2=Chlordane 0.5%, T3=Dieldrin at 50 ccs./ac. actual, T4=Toxaphene 0.1%, T5=Endrin 0.1%, T6=Folidol 0.1%, T7=Parathion 0.05% at 2 lb./ac. of 2.5% WDP in 100 gallons of water, T8=Ryania 40% dust at 10 lb./ac. in pre-monsoon and 40 lb./ac. in post monsoon, T9=Toxaphene 10% dust at 80 lb./ac., T10=DDT 0.1% and T11=BHC 0.25%.

In the treatments T1 and T7 suspension spray, in T8 and T9 dusting and in others emulsion spray is done.

3. DESIGN:
(i) R.B.D. (ii) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/24 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Atta:ck of borers. (iii) Yield of sugarcane and number of dead hearts. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
Sugarcane yield
(i) 26.01 tons/ac. (ii) 2.87 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T9</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>29.19</td>
<td>28.58</td>
<td>24.81</td>
<td>24.86</td>
<td>25.94</td>
<td>25.75</td>
<td>26.60</td>
<td>27.77</td>
<td>25.36</td>
<td>23.19</td>
<td>23.01</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.66 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Object:—To study the effect of soil applications of B.H.C., Chlordane, Toxaphene and Aldrin against hot weather attack of borers on Sugarcane.

Number of dead hearts
(i) 2135 dead hearts/ac. (ii) 374.6 dead hearts/ac. (iii) Treatment differences are not significant. (iv) Av. number of dead hearts/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T9</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number</td>
<td>2864</td>
<td>2488</td>
<td>1944</td>
<td>3128</td>
<td>1704</td>
<td>2328</td>
<td>1544</td>
<td>1944</td>
<td>1696</td>
<td>1880</td>
<td>2032</td>
<td>2072</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>424.1 dead hearts/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Object:—To study the effect of soil applications of B.H.C., Chlordane, Toxaphene and Aldrin against hot weather attack of borers on Sugarcane.
1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 17.2.1955. (iv) (a) and (b) N.A. (c) 57 sets (3 budded)/row. (d) and (e) N.A. (v) N.A. (vi) CO—527. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   8 insecticidal treatments: 
   - T0 = Control, T1 = BHC at 2.5 lb./ac. 
   - T2 = BHC at 5.0 lb./ac. 
   - T3 = Chlordane at 2.5 lb./ac. 
   - T4 = Chlordane at 5.0 lb./ac. 
   - T5 = Toxaphene at 4.0 lb./ac. 
   - T6 = Toxaphene at 5.0 lb./ac. 
   - T7 = Aldrin at 1.0 lb./ac.

   Treatments applied on 7 to 10.5.1955.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) and (b) 55' x 17.5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Total number of dead hearts observed 1& 2 months after application and yield of sugarcane. (iv) (a) and (b) Nil. (v) to (vii) Nil.

5. RESULTS:
   Sugarcane yield
   (i) 3.10 tons/ac. (ii) 3.99 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

   Treatment: 
   - T0, T1, T2, T3, T4, T5, T6, T7
   - Av. yield: 31.18, 32.65, 34.36, 31.23, 32.76, 27.64, 29.13
   - S.E./mean = 2.70 tons/ac.

   Number of dead hearts
   (i) 5.47. (ii) 0.78. (iii) Treatment differences are not significant. (iv) Mean value of y/x where x = number of dead hearts/plot.

   Treatment: 
   - T0, T1, T2, T3, T4, T5, T6, T7
   - Mean value: 5.89, 5.07, 4.70, 6.57, 5.34, 5.78, 4.82, 5.59
   - S.E./mean = 0.45

   Transformed back counts: 34.69, 25.70, 22.09, 43.16, 28.52, 33.41, 23.23, 31.25

---


Site = Indian Instt. of Sugarcane Res., Lucknow. Type = 'D'.

Object = To study the effect of soil application of different insecticides against early shoot borer Chilotraea infuscatae snell on Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 17.2.1956. (iv) (a) and (b) N.A. (c) 636 sets (3 budded)/row. (d) 3' x 4.5'. (e) N.A. (v) N.A. (vi) CO. 527. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   5 insecticidal treatments: 
   - T0 = Control, T1 = BHC at 2.5 lb./ac. 
   - T2 = BHC at 5 lb./ac. 
   - T3 = Chlordane at 2.5 lb./ac. 
   - T4 = Chlordane at 5 lb./ac. 
   - T5 = Toxaphene at 5 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) and (b) 55' x 33'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Attack of shoot borer. (iii) Yield of sugarcane and number of dead hearts (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:

**Sugarcane yield**

(i) 31.21 tons/ac.  (ii) 6.13 toas/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>33.91</td>
<td>28.27</td>
<td>37.71</td>
<td>26.99</td>
<td>29.45</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 3.57 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Number of dead hearts**

(i) 7197 dead hearts/ac.  (ii) 3091 dead hearts/ac.  (iii) Treatment differences are not significant.  (iv) Av. number of dead hearts/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number</td>
<td>8640</td>
<td>6952</td>
<td>4288</td>
<td>9236</td>
<td>6848</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 1785 dead hearts/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Crop:** Sugarcane.  
**Ref:** I.I.S.R. 59(397).  
**Site:** Indian Instt. of Sugarcane Res., Lucknow.  
**Type:** 'D'.  
**Object:** To study the effect of application of BHC against termitie and shoot borer on Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) to (e) N.A.  (ii) (a) Sandy loam.  (b) Refer soil analysis, I.I.S.R., Lucknow.  (iii) 19,3.1959.  (iv) (a) and (b) N.A.  (c) 720 sets (3 X 160 sets) plot.  (d) F X 1.5'.  (e) N.A.  (iv) N.A.  (v) CO.S.—443.  (vi) Irrigated.  (vii) to (x) N.A.

2. TREATMENTS:
   8 insecticidal treatments: T₀ = Control (no application), T₁ = 1 lb./ac. of Gamma BHC emulsion in 5 gallons of water, T₂ = 1 lb./ac. of Gamma BHC emulsion in 15 gallons of water, T₃ = 1 lb./ac. of Gamma BHC emulsion in 25 gallons of water, T₄ = 8 ozs./ac. of 0.65% Gamma BHC dust, T₅ = 4 ozs./ac. of 0.65% Gamma BHC dust, T₆ = 20 lb./ac. of 5% BHC dust over the sets in furrows and T₇ = Aretan/BHC at 1 lb./ac. in 20 gallons of water.

In treatments T₃, T₄, T₅ and T₆ the seed cane pieces are dipped in the solution.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 8.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 40' X 15'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) N.A.  (ii) Attack of termite and shoot borer.  (iii) Number of dead hearts.  (iv) (a) and (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
   (i) 1634 dead hearts/ac.  (ii) 1062 dead hearts/ac.  (iii) Treatment differences are not significant.  (iv) Av. number of dead hearts/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number</td>
<td>1180</td>
<td>853</td>
<td>1616</td>
<td>1488</td>
<td>762</td>
<td>1779</td>
<td>2232</td>
<td>3158</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 531 dead hearts/ac.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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Crop: Sugarcane.  
Ref: I.I.S.R. 59(397).  
Site: Indian Instt. of Sugarcane Res., Lucknow.  
Type: 'D'.  
Object: To study the effect of application of BHC against termitie and shoot borer on Sugarcane.
1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 18.3.1959. (iv) (a) and (b) N.A. (c) 50 setts (3 budded)/row. (d) 3' X 1.5'. (e) N.A. (v) N.A. (vi) CO. 443. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   7 insecticidal treatments: 
   - $T_0$ = Control, 
   - $T_1$ = Gamma BHC emulsion over the setts in furrows at 1 lb. actual/ac. by water canal, 
   - $T_2$ = Dipping the setts in Gamma BHC at 8 ozs/ac. emulsion in 10 gallons of water, 
   - $T_3$ = Dipping the setts in Gamma BHC at 8 ozs/ac. emulsion in 5 gallons of water, 
   - $T_4$ = BHC dust over the setts in furrows at 1 lb/ac. 
   - $T_5$ = BHC 5% dust at 20 lb/ac. over the setts in furrows and 
   - $T_6$ = Dipping the setts in Arctan/BHC solution at 1 lb/ac. in 20 gallons of water.

3. DESIGN:
   (i) R.B.D. (ii) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 40' X 15'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Attack of termite and shoot borer. (iii) Number of dead hearts. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2321 dead hearts/ac. (ii) 779.8 dead hearts/ac. (iii) Treatment differences are not significant. (iv) Av. number of dead hearts/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number</td>
<td>2305</td>
<td>1833</td>
<td>2378</td>
<td>1778</td>
<td>2256</td>
<td>2784</td>
<td>2885</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>389.9 dead hearts/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Sugarcane.  
Ref: I.I.S.R. 59(409).  
Site: Indian Instt. of Sugarcane Res., Lucknow.  
Type: 'D'.

Object: To study the effect of foliar application of insecticides against stalk borer on Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 12.3.1959. (iv) (a) to (c) N.A. (d) 3' X 1.5'. (e) N.A. (v) CO. 537. (vi) Irrigated. (vii) to (x) N.A.

2. TREATMENTS:
   8 insecticidal treatments:
   - $T_0$ = Control, 
   - $T_1$ = BHC at 1 lb/ac., 
   - $T_7$ = DDT at 1 lb/ac., 
   - $T_3$ = Endrin at 1 lb/ac., 
   - $T_4$ = Folidol at 4 ozs/ac., 
   - $T_8$ = $T_2 + T_4$, 
   - $T_9$ = $T_3 + T_4$ and 
   - $T_7$ = Basudin at 1 lb/ac.

3. DESIGN:
   (i) R.B.D. (ii) 8. (b) N.A. (iii) 3. (iv) (a) and (b) 55' X 33'. (v) No. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Attack of stalk borer. (iii) Yield of sugarcane and percentage incidence of stalk borer at harvest. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   Sugarcane yield
   (i) 18.60 tons/ac. (ii) 2.68 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_7$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>16.55</td>
<td>18.75</td>
<td>17.89</td>
<td>15.24</td>
<td>21.11</td>
<td>20.65</td>
<td>21.76</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.55 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Incidence of stalk borer

(i) 34.82 degrees. (ii) 11.61 degrees. (iii) Treatment differences are not significant. (iv) Mean % of incidence of stalk borer in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_0</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>38.19</td>
<td>26.71</td>
<td>20.78</td>
<td>29.50</td>
<td>29.72</td>
<td>33.51</td>
<td>57.60</td>
<td>34.35</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>6.70 degrees.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Transformed back % 38.68 20.50 12.93 24.51 37.56 30.70 71.09 32.01

Crop: Sugarcane.

Site: Indian Insti. of Sugarcane Res., Lucknow. Type - 'D'.

Object: To study the effect of soil application of insecticides against shoot borer on Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, I.I.S.R., Lucknow. (iii) 13.3.1959. (iv) (a) and (b) N.A. (c) 500 buds/plot. (d) 3' × 1.5'. (e) N.A. (v) CO. S. 357. (vi) Irrigated. (vii) to (viii) N.A.

2. TREATMENTS:
   All combinations of (1) and (2) + control (2 plots)
   (i) 3 insecticidal treatments: T_1 = Endrin at 0.5 lb./ac, T_2 = BHC at 2.5 lb./ac. and T_3 = BHC at 5 lb./ac.

   (2) 2 times of application: A_1 = One application in May and A_2 = Two applications in May and June each.

3. DESIGN:
   (i) R.B.D. (ii) 8. (b) N.A. (iii) 3. (iv) (a) and (b) 25' × 15'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Attack of shoot borer. (iii) Counts of dead heart. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 19941 dead hearts/ac. (ii) 6692 dead hearts/ac. (iii) None of the effects is significant. (iv) Av. number of dead hearts/ac.

   | Control | 23852 |

<table>
<thead>
<tr>
<th></th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A_1</td>
<td>16340</td>
<td>18856</td>
<td>18973</td>
<td>18056</td>
</tr>
<tr>
<td>A_2</td>
<td>22922</td>
<td>17347</td>
<td>17385</td>
<td>19218</td>
</tr>
<tr>
<td>Mean</td>
<td>19631</td>
<td>18102</td>
<td>18179</td>
<td>18637</td>
</tr>
</tbody>
</table>

S.E. of A marginal mean = 2231 dead hearts/ac. S.E. of T marginal mean or control mean = 2712 dead hearts/ac. S.E. of body of table = 3864 dead hearts/ac.
Central Potato Research Institute
SIMLA
CENTRAL POTATO RESEARCH STATION, PATNA

1. Name of the experimental station: Central Potato Research Station.

2. Tehsil or Taluka: —


4. Address: Central Potato Research Station, P.O. Sahay Nagar, Patna (Bihar).


6. Latitude 25°37' N  Longitude 85°10' E  Altitude 173 feet

7. Whether research, multiplication or demonstration farm: Research cum seed multiplication farm.

8. Whether State, University or private managed: I.C.A.R.

9. Programme of research: This research station undertakes research on potato problems relating to Agronomy, Botany, Plant Pathology, Entomology and Agricultural Engineering.


11. Type of tract it represents: Alluvial.

12. General description of the topography of the experimental area: The experimental area is divided into half acre units and is levelled and plain.

13. Soils:
   (a) Broad soil types: Sandy, sandy loam and clay loam.
   (i) Depth: Shallow.
   (ii) Colour: Sandy to light loam.
   (iii) Structure: Loose to compact

   (b) Chemical analysis:

<table>
<thead>
<tr>
<th>Textural class</th>
<th>Sandy</th>
<th>Sandy loam</th>
<th>Clay loam</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>6.8 to 7.1</td>
<td>7.0 to 7.2</td>
<td>6.9 to 7.3</td>
</tr>
<tr>
<td>Cation exchange capacity (m.e./100 gm.)</td>
<td>4.9 to 7.7</td>
<td>6.5 to 9.0</td>
<td>7.3 to 9.6</td>
</tr>
<tr>
<td>Available nitrogen in lb./ac.</td>
<td>123 to 375</td>
<td>291 to 482</td>
<td>275 to 500</td>
</tr>
<tr>
<td>Available phosphorus in lb./ac.</td>
<td>105 to 360</td>
<td>55 to 589</td>
<td>136 to 485</td>
</tr>
<tr>
<td>Available potassium in lb./ac.</td>
<td>130 to 525</td>
<td>237 to 497</td>
<td>317 to 859</td>
</tr>
<tr>
<td>Organic carbon %</td>
<td>0.5 to 0.8</td>
<td>0.4 to 1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>
POTATO EXPERIMENTAL AND TRIAL CENTRE, JULLUNDUR

1. Name of the experimental station: Potato Experimental and Trial Centre,

2. Tehsil or Taluka: Jullundur.

3. District: Jullundur.

4. Address: Regional Botanist, Potato Exptl. and Trial Centre, Post Bag No. 4., Jullundur,

5. Year of establishment: 1957.

6. Latitude: 31° 19 mts. 36 sec. N.

7. Whether research multiplication or demonstration farm: Research farm.


9. Programme of Research: Research work on Botany, Agronomy, Virus pathology, seed production techniques and other connected problems of potato cultivation.

10. Normal cropping pattern:

   - Green Manure—Potato—Fallow (one year rotation)
   - Green Manure—Potato—Potato (one year rotation)
   - Green Manure—Potato—Wheat (one year rotation)

13. Soils:

   (a) Broad soil types:
      (i) Depth: N.A.
      (ii) Colour: Very deep.
      (iii) Structure: Yellowish brown.

   (b) Chemicals analysis: N.A.

   (c) Mechanical analysis: N.A.

14. Normal average rainfall in cm.:


   (The period on which the figures are based is 1962—1966.)

15. Irrigation facilities available:

   Lift irrigation tube-well; since 1957.

16. Whether any proper drainage system exists:

   Only natural drainage which is quite satisfactory.
POTATO EXPERIMENTAL AND TRIAL CENTRE, BABUGARH.

1. Name of the experimental station: Potato Experimental and Trial Centre.

2. Tehsil or Taluka: Hapur.

3. District: Meerut.

4. Address: P.O. Babugarh, Distt. Meerut, U.P.

5. Year of establishment: 1957.

6. Latitude: N.A.

7. Whether research, multiplication or demonstration farm: Research-cum-multiplication farm.

8. Whether State, University or private managed: I.C.A.R. managed.

9. Programme of research: To evolve new potato varieties and to find out their cultural and manural requirements for the region.


11. Type of tract it represents: Indo-Caugetic plains (Western U. P.).

12. General description of the topography of the experimental area:

The landscape has a gradual gradient from west to east. On the upper side soil is clayey type, alkaline in some patches and contains kanker beds. These fields contain mainly sub-soil due to shifting of soil during levelling. Middle fields are lower by at least 3 ft. than the fields at the upper end and contain loamy type of soil. Fields at the down end are further lower by 4 ft. and contain sandy loam type of soil. Fertility varies along the gradient.

13. Soils:

(a) Broad soil types:

(i) Depth:

(ii) Colour:

(iii) Structure:

(b) Chemical analysis:

<table>
<thead>
<tr>
<th>Depth</th>
<th>pH</th>
<th>Organic carbon %</th>
<th>Total nitrogen %</th>
<th>P₂O₅ lb/ac.</th>
<th>Available K₂O lb/ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0—6&quot;</td>
<td>7.1</td>
<td>0.240</td>
<td>0.0378</td>
<td>Above 36</td>
<td>Below 100</td>
</tr>
<tr>
<td>6&quot;—18&quot;</td>
<td>7.1</td>
<td>0.165</td>
<td>0.028</td>
<td>0—9</td>
<td>from 0—86</td>
</tr>
<tr>
<td>18&quot;—36&quot;</td>
<td>7.1</td>
<td>0.105</td>
<td>0.028</td>
<td>0—9</td>
<td>depth</td>
</tr>
</tbody>
</table>

(c) Mechanical analysis:

<table>
<thead>
<tr>
<th>Depth</th>
<th>Coarse sand %</th>
<th>Fine sand %</th>
<th>Silt %</th>
<th>Clay %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0—6&quot;</td>
<td>5.560</td>
<td>59.790</td>
<td>24.000</td>
<td>6.400</td>
</tr>
<tr>
<td>6&quot;—18&quot;</td>
<td>3.845</td>
<td>44.735</td>
<td>28.400</td>
<td>19.800</td>
</tr>
<tr>
<td>18&quot;—36&quot;</td>
<td>4.315</td>
<td>45.900</td>
<td>24.200</td>
<td>23.800</td>
</tr>
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</table>
14. Normal average rainfall in inches:

<table>
<thead>
<tr>
<th></th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>1.2</td>
<td>21.76</td>
<td>80.01</td>
<td>16.83</td>
<td>2.91</td>
<td>0.04</td>
<td>0.84</td>
<td>2.39</td>
<td>0.25</td>
<td>1.74</td>
<td>0.58</td>
<td>0.80</td>
<td>79.35</td>
</tr>
</tbody>
</table>

(The period on which the figures are based is 1960—1964.)

15. Irrigation facilities available:

<table>
<thead>
<tr>
<th>Facility</th>
<th>Year available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube well</td>
<td>since 1957</td>
</tr>
</tbody>
</table>

16. Whether any proper drainage system exists:

| 16. | No. |
14. Normal average rainfall in cm:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall</td>
<td>18</td>
<td>41</td>
<td>13</td>
<td>9</td>
<td>28</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>110</td>
</tr>
</tbody>
</table>

(The figures are based on the rainfall of 1964—1965)

Note:— Bihar State faced drought in 1965, hence figures of rainfall in 1964 have been taken as they may be more towards normal.

15. Irrigation facilities available: Tube well; since 1954.

16. Whether any proper drainage system exists: Yes.
Crop :- Potato (Rabi).

Site :- Central Potato Res. Stn., Babugarh.

Ref :- C.P.R.I. 58(103).

Type :- 'M'.

Object :- To study the effect of different sources of N with P and K on Potato yield.

1. BASAL CONDITIONS :

(i) to (vi) N.A.  (vii) Irrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS :

All combinations of (1) and (2) + a control

(1) 4 sources of N : S1=Nitrophoska blue, S2=Nitrophoska green, S3=C/A/N and S4=A/S.

(2) 3 levels of N : N1=50, N2=100 and N3=150 lb./ac.

48 lb./ac. of Super and 224 lb./ac. of Pot. Sul. applied to S2 and S4.

3 DESIGN :

(i) R.B.D.  (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A.  (b) 1/160 ac.  (v) N.A.  (vi) Yes.

4. GENERAL :

(i) Good. (ii) N.A. (iii) Yield of tubers. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullundur and Patna. (b) Nil. (vi) Nil. (vii) Mean yield of control is N.A.

5. RESULTS:

(i) N.A. (ii) 1.91 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of tubers in tons/ac.

\[
\begin{array}{cccc|c}
S_1 & S_2 & S_3 & S_4 & \text{Mean} \\
N_1 & 9.47 & 11.78 & 11.27 & 11.48 & 11.60 \\
N_2 & 11.30 & 11.48 & 9.60 & 10.32 & 10.68 \\
N_3 & 11.56 & 13.81 & 12.33 & 10.90 & 12.15 \\
\text{Mean} & 10.78 & 12.36 & 11.07 & 10.90 & 11.28 \\
\end{array}
\]

S.E. of N marginal mean = 0.55 tons/ac.

S.E. of S marginal mean = 0.64 tons/ac.

S.E. of body of table = 1.10 tons/ac.

---

Crop :- Potato (Rabi).

Site :- Central Potato Res. Stn., Babugarh.

Ref :- C.P.R.I. 57(96).

Type :- 'M'.

Object :- To study the effect of N, P and K due to soil and spray application.

1. BASAL CONDITIONS :

(i) to (v) N.A.  (vi) Up-to-date. (vii) Irrigated. (viii) 1 earthing. (ix) and (x) N.A.

2. TREATMENTS :

Main-plot treatments :

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N0=0, N1=50 and N2=150 lb./ac.

(2) 3 levels of P2O5 as Super : P0=0, P1=50 and P2=100 lb./ac.

Sub-plot treatments :

2 methods of application of manures : S1=Soil and S2=Spray application.

3. DESIGN :

(i) Split-plot.  (ii) (a) 9 main-plots/block ; 2 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 19.5°x17.25°. (b) 16.5°x16.5°.  (v) N.A.  (vi) Yes.

4. GENERAL :

(i) Normal. (ii) N.A. (iii) Tuber yield. (iv) (a) N.A.  (b) No. (c) Nil. (v) (a) Jullundur and Patna. (b) Nil. (vi) N.A. (vii) Nil.
5. RESULTS:
(i) 4.96 tons/ac.  (ii) (a) 1.41 tons/ac.  (b) 0.63 tons/ac.  (iii) Main effect of S and interaction N×S are highly significant. Interaction P×S is significant.  (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>5.27</td>
<td>5.49</td>
<td>4.72</td>
<td>5.16</td>
<td>4.31</td>
<td>5.14</td>
<td>6.04</td>
</tr>
<tr>
<td>S₂</td>
<td>4.78</td>
<td>4.65</td>
<td>4.83</td>
<td>4.75</td>
<td>4.47</td>
<td>4.97</td>
<td>4.82</td>
</tr>
<tr>
<td>Mean</td>
<td>5.03</td>
<td>5.07</td>
<td>4.78</td>
<td>4.96</td>
<td>4.39</td>
<td>5.06</td>
<td>5.44</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N or P marginal means = 0.41 tons/ac.
2. S marginal means = 0.15 tons/ac.
3. S means at the same level of N or P = 0.26 tons/ac.
4. N or P means at the same level of S = 0.45 tons/ac.
S.E. of body of N×P table = 0.50 tons/ac.

Crop: Potato (Rabi).
Site: Central Potato Res. Stn., Babugharh.
Object: To try the commercial fertilizer mixtures containing N, P and K in different ratios against A/S.

1. BASAL CONDITIONS:
   (i) to (vi) N.A.  (vii) Irrigated.  (viii) 1 weeding and 1 earthing.  (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)+control (2 plots)
   (1) 4 sources of N: S₁ = A/S, S₂ = Nitrophoska green, S₃ = Nitrophoska blue and S₄ = C/A/N.
   (2) 3 levels of N: N₁ = 75, N₂ = 150 and N₃ = 225 lb./ac. 448 lb./ac. of Super and 224 lb./ac. of Pot. Sul. applied to S₁ and S₃.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 14.  (b) N.A.  (iii) 5.  (iv) (a) 19'/×19'/.  (b) 16'/×16'/.  (v) 1.5'/×1.5'/.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) N.A.  (iii) Yield of tubers.  (iv) (a) 1957–1959.  (b) No.  (c) Nil.  (v) (a) Jullundur and Patna.  (b) Nil.  (vi) Nil.  (vii) Mean yield of control is N.A.

5. RESULTS:
   (i) N.A.  (ii) 3.03 tons/ac. (iii) Only 'control vs. others' is highly significant.  (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
<td>12.97</td>
<td>14.44</td>
<td>13.06</td>
<td>14.79</td>
<td>13.82</td>
</tr>
<tr>
<td>N₂</td>
<td>14.52</td>
<td>15.22</td>
<td>16.41</td>
<td>13.41</td>
<td>14.89</td>
</tr>
<tr>
<td>N₃</td>
<td>13.81</td>
<td>15.79</td>
<td>15.21</td>
<td>15.16</td>
<td>14.99</td>
</tr>
<tr>
<td>Mean</td>
<td>13.77</td>
<td>15.15</td>
<td>14.89</td>
<td>14.45</td>
<td>14.57</td>
</tr>
</tbody>
</table>
Crop: Potato (Rabi).
Site: Central Potato Res. Stn., Babugarh.

Object: To compare the effect of N, P and K through soil and spray application.

1. BASAL CONDITIONS:
(i) to (v) N.A. (vi) Up-to-date. (vii) Irrigated. (viii) Earthing. (ix) and (x) N.A.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1), (2) and (3)
(i) 2 levels of N : N₀ = 0 and N₁ = 100 lb/ac.
(ii) 2 levels of P : P₀ = 0 and P₁ = 100 lb/ac.
(iii) 2 levels of K : K₀ = 0 and K₁ = 100 lb/ac.

Sub-plot treatments:
2 methods of application : M₁ = Soil application and M₂ = Spray application.

3. DESIGN:
(i) Split-plot. (ii) 8 main-plots/repliCdtion; 2 sub-plots/main-plot. (b) N.A. (iii) 19.5' × 19.5'.
(iv) 1/160 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of tubers. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullundur and Patna. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 8.45 tons/ac. (ii) (a) 1.62 tons/ac. (b) 1.47 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>K₀</th>
<th>K₁</th>
<th>M₁</th>
<th>M₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>7.72</td>
<td>8.95</td>
<td>7.76</td>
<td>8.92</td>
<td>8.57</td>
<td>8.10</td>
<td>8.34</td>
</tr>
<tr>
<td>N₁</td>
<td>8.24</td>
<td>8.50</td>
<td>8.62</td>
<td>8.52</td>
<td>8.71</td>
<td>8.42</td>
<td>8.57</td>
</tr>
<tr>
<td>Mean</td>
<td>7.98</td>
<td>8.92</td>
<td>8.19</td>
<td>8.72</td>
<td>8.64</td>
<td>8.26</td>
<td>8.65</td>
</tr>
<tr>
<td>M₁</td>
<td>8.36</td>
<td>8.92</td>
<td>8.59</td>
<td>8.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M₂</td>
<td>7.61</td>
<td>8.92</td>
<td>7.88</td>
<td>9.65</td>
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<td>8.49</td>
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<tr>
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<td>9.36</td>
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</tbody>
</table>

S.E. of difference of two

1. N, P or K marginal means = 0.40 tons/ac.
2. M marginal means = 0.37 tons/ac.
3. M means at the same level of N, P or K = 0.52 tons/ac.
4. N, P or K means at the same level of M = 0.55 tons/ac.
5. S.E. of body of N × P, N × K or P × K table = 0.40 tons/ac.
Crop: Potato (Rabi).
Site: Central Potato Res. Stn., Babugarh.

Object: To study the effect of various micro-nutrient elements on the yield of Potato.

1. BASAL CONDITIONS:
(i) to (x) N.A.  (x) 14.2.1959.

2. TREATMENTS:
All combinations of (1), (2), (3), (4), (5) and (6)
(1) 2 levels of B: B₀ = Absence and B₁ = Presence.
(2) 2 levels of Mn: M₀ = Absence and M₁ = Presence.
(3) 2 levels of Zn: Z₀ = Absence and Z₁ = Presence.
(4) 2 levels of Mo: M₀ = Absence and M₁ = Presence.
(5) 2 levels of Cu: C₀ = Absence and C₁ = Presence.
(6) 2 levels of Fe: F₀ = Absence and F₁ = Presence.

Doses of micro-nutrients are not available.

3. DESIGN:
(i) 2⁴ confd. (ii) (a) 8 plots/block; 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/160 ac.
(v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Potato yield. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 9.43 tons/acre. (ii) 1.30 tons/acre. (iii) Main effect of N and interaction N×M are significant. (iv) Table of mean and differential responses in tons/acre.

<table>
<thead>
<tr>
<th>Differential response</th>
<th>B</th>
<th>M</th>
<th>Z</th>
<th>C</th>
<th>N</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean response</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ -</td>
<td>0.29</td>
<td>0.21</td>
<td>0.23</td>
<td>0.06</td>
<td>0.67</td>
<td>0.43</td>
</tr>
<tr>
<td>-</td>
<td>0.30</td>
<td>0.12</td>
<td>0.38</td>
<td>0.36</td>
<td>1.04</td>
<td>0.19</td>
</tr>
<tr>
<td>Mean response</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>0.31</td>
<td>0.50</td>
<td>0.53</td>
<td>0.57</td>
<td>0.02</td>
<td>0.27</td>
</tr>
<tr>
<td>M</td>
<td>0.00</td>
<td>0.32</td>
<td>0.86</td>
<td>0.57</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>Z</td>
<td>0.07</td>
<td>0.74</td>
<td>0.31</td>
<td>0.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0.65</td>
<td>0.48</td>
<td>0.15</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>0.53</td>
<td>0.05</td>
<td>0.59</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>0.05</td>
<td>0.00</td>
<td>0.13</td>
<td>0.21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of mean response = 0.32 tons/acre.
S.E. of differential response = 0.46 tons/acre.

Crop: Potato (Rabi).
Site: Central Potato Res. Stn., Babugarh.

Object: To study the effect of various micro-nutrients elements on Potato yield.

1. BASAL CONDITIONS:
(i) to (x) N.A.

2. TREATMENTS:
Same as in expt. no. 58(102) above.
3. DESIGN:
(i) 2' confd. (ii) 8 blocks/replication and 8 plots/block. (b) N.A. (iii) 1. (iv) (a) 1/115 ac. (b) 1/160/ac.
(v) and (vi) N.A.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of potato. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullundur and Patna.
(b) N.A. (vii) and (viii) Nil.

5. RESULTS:
(i) 10.54 tons/ac. (ii) 1.24 tons/ac. (iii) None of the effects is significant. (iv) Table of mean and differential responses in tons/ac.

<table>
<thead>
<tr>
<th>Crop =&gt; Potato.</th>
<th>Site =&gt; Potato Exptl. and Trial Centre, Jullundur.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type =&gt; M'.</td>
<td>Ref =&gt; C.P.R.I. SF(47).</td>
</tr>
</tbody>
</table>

Object => To compare the effects of different fertilizer mixtures on Potato.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Sancbemp. (d) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Jullundur. (iii)
26.10.1958. (iv) (a) 1 tractor ploughing, 2 plankings and 1 discing. (b) By hand. (c) 15 to 20 mds/ac.
(d) 21"x9". (e) 1. (vi) F.Y.M. at 250 mds/ac. (vi) Kufri red. (vi) Irrigated. (vi) 3 crust breakings,
weeding and 1 earthing. (ix) 5.24". (x) 30.3.1959 to 5.4.1959.

2. TREATMENTS:
Same as in exp. no. 58(103) on page 159.

3. DESIGN:
(i) R.B.D. (ii) (a) 13. (iii) 5. (iv) (a) 194'x194'. (b) 164'x164'. (v) 1.5'x1.5'. (vi) Yes.

4. GENERAL:
(i) Normal except for control. (ii) Severe effect of early blights, moderate effect of late blight and frost were
observed. Sprays of Bordeaux mixture and Bsudoem were given to check them and irrigation interval was
reduced to 3 days during severe frost days. (iii) Tuber yield. (iv) (a) 1958—1959. (b) No. (c) Nil. (v)
(a) Babugarh and Patna. (b) Nil. (vii) and (viii) Nil.

5. RESULTS:
(i) 5.94 tons/ac. (ii) 0.72 tons/ac. (iii) Main effects of S and N are highly significant and interaction S X N
and 'control vs. others' are significant. (iv) Av. yield of tuber in tons/ac.
Crop :- Potato.  
Site :- Potato Exptl. and Trial Centre, Jullundur.  
Type :- 'M'.

**Object** :- To compare the effect of different fertilizer mixtures on Potato.

1. **BASAL CONDITIONS** :
   (i) (a) N.A. (b) Sandhemp. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis Jullundur. (iii) 24.10.1959. (iv) (a) 1 tractor ploughing, 2 plankings and 1 discing. (b) By hand. (c) 15 to 20 md/s.ac. (d) 21°x9°. (e) L. (v) N.A. (vi) Kured. (vii) Irrigated. (viii) 3 crust breakings, weedings and 1 earthing. (ix) 2.24°. (x) 1.3.1960.

2. **TREATMENTS** :
   Same as in expt. no. 59(91) on page 160.
   Manures applied on 24.10.1959.

3. **DESIGN** :
   (i) R.B.D. (ii) 14. (b) 39°x136.5°. (iii) 5. (iv) (a) 19°x19°. (b) 16°x16°. (v) 1.5°x1.5°. (vi) Yes.

4. **GENERAL** :
   (i) Normal except control. (ii) Severe effect of early blight, moderate effect of late blight and frost were observed. Sprays of Bordeaux mixture and Basudin were given to check them and irrigation interval was reduced to 3 days during severe frost. (iii) Tubers yield. (iv) (a) 1958-1959. (b) No. (c) Nil. (v) Babugarh and Patna. (b) Nil. (vi) N.A. (vii) Control yield is N.A.

5. **RESULTS** :
   (i) N.A. (ii) 1.58 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tuber in tons/ac.

   **Control = N.A.**

<table>
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<th></th>
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<th>S₃</th>
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   S.E. of N marginal mean = 0.35 tons/ac.
   S.E. of S marginal mean = 0.41 tons/ac.
   S.E. of body of table = 0.71 tons/ac.
Crop : Potato.  
Ref : C.P.R.I. 58(46).

Site : Potato Exptl. and Trial Centre, Jullundur.  
Type :- 'M'.

Object :- To study the effect of micro-nutrient elements in various combinations on the growth and yield of Potato.

1. BASAL CONDITIONS :
   (i) (a) N.A.  (b) Sannhemp.  (c) Nil.  (ii) (a) Sandy loam.  (b) Refer soil analysis, C.P.R.I., Jullundur.  (i i ) 18.10.1958.  (iv) (a) 1 tractor ploughing, 2 plankings and 1 disking.  (b) By hand.  (c) 15 to 20 tons/acre.  (d) 21'X9'.  (e) 1.  (v) 150 lb./acre of N as Ca(NH)2.  (vi) 21'X9'.  (vii) Irrigated.  (viii) 3 crust breaking, 3 weedings and 1 earthing.  (ix) 4.96'.  (x) 5 to 9.3.1959.

2. TREATMENTS :
   All combinations of (1), (2), (3), (4), (5) and (6)
   (1) 2 levels of Boron : B0 = 0 and B1 = 0.375% solution of Boric Acid.
   (2) 2 levels of Manganese : M0 = 0 and M1 = 0.375% solution of Manganese sulphate.
   (3) 2 levels of Zinc : Z0 = 0 and Z1 = 0.15% solution of Zinc Sulphate.
   (4) 2 levels of Copper : C0 = 0 and C1 = 0.75% solution of CuSO4.
   (5) 2 levels of Molybdenum : Mb0 = 0 and Mb1 = 0.75% solution of Ammonium Molybdate.
   (6) 2 levels of Iron : I0 = 0 and I1 = 0.75% solution of Ferrous Sulphate.

3. DESIGN :
   (i) 2' fact.  (ii) (a) 8 plots/block; 8 blocks/replication.  (b) 156' X 156'.  (iii) 1.  (iv) (a) 19.5' X 19.5'.  (b) 16.5' X 16.5'.  (v) 1.5' X 1.5'.  (vi) Yes.

4. GENERAL :
   (i) Normal.  (ii) Early blight and frost were severe, late blight was moderate. Sprays of Bordeaux mixture were given to check blights and aphis and irrigation interval was reduced to three days.  (iii) Yield of tubers.  (iv) (a) 1958-1919.  (b) No.  (v) (a) Babugarh and Patna.  (b) Nil.  (vi) N.A.  (vii) Nil.

5. RESULTS :
   (i) 5.04 tons/ac.  (ii) 1.12 tons/ac.  (iii) Only interaction Z X M is highly significant.  (v) Table of mean and differential responses in tons/ac.

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<th></th>
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<th>Z</th>
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<td>-</td>
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<tr>
<td>C</td>
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<td>I</td>
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<td>-0.34</td>
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</table>

S.E. of mean response = 0.28 tons/ac.
S.E. of differential response = 0.40 tons/ac.
1. **BASAL CONDITIONS:**

(i) (a) N.A.  (b) Sandhemp.  (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Jullundur.

(iii) 20.10.1959.  (iv) (a) 1 tractor ploughings, 2 plankings, and 1 discing. (b) By hand. (c) 15 to 20 mds./ac.

(d) 21' x 9'.  (e) 1.  (v) 150 lb./ac. of N as C/A/N+75 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super+100 lb./ac. of K<sub>2</sub>O as Pot. Sui. were applied in bands below the seed at the time of planting. (vi) Up-to-date. (vii) Irrigated. (viii) 3 crust breakings, 3 weedings and 1 earthing. (ix) 2.24'.  (x) 1.3.1960.

2. **TREATMENTS to 4. ** **GENERAL:**

Same as in exp. no. 58(46) on page 165.

3. **RESULTS:**

(i) 5.11 tons/ac.  (ii) 0.80 tons/ac.  (iii) Main effect of B alone is significant.  (iv) Table of mean and differential responses in tons/ac.

**Differential response**

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<td>-</td>
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<td>+</td>
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<td>-0.12</td>
<td>-0.39</td>
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<td>+</td>
<td>-0.61</td>
<td>-0.55</td>
<td>-0.11</td>
<td>0.05</td>
<td>-0.23</td>
<td>-0.39</td>
</tr>
</tbody>
</table>

S.E. of mean response = 0.20 tons/ac.

S.E. of differential response = 0.28 tons/ac.

**Crop >> Potato.**

**Site >> Potato Exptl. and Trial Centre, Jullundur.**

**Type >> ‘M’.**

Object:—To see the effect of soil and foliar applications of N and P on the yield of Potato.

1. **BASAL CONDITIONS:**

(i) (a) N.A.  (b) Sandhemp.  (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Jullundur.

(iii) 13.10.1958.  (iv) (a) 1 tractor ploughings, 2 plankings and 1 discing. (b) By hand. (c) 15 to 20 mds./ac.

(d) 21' x 9'.  (e) 1.  (v) 250 mds./ac. of FYM one month before the planting of tubers. (vi) N.A. (vii) Irrigated. (viii) Matching after every irrigation and 2 earthing. (ix) 4.06'. (x) 2 2.1959.

2. **TREATMENTS:**

Main-plot treatments:

All combinations of (1) and (2)

(1) 3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=50 and N<sub>2</sub>=100 lb./ac.

(2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>0</sub>=0, P<sub>1</sub>=50 and P<sub>2</sub>=100 lb./ac.

Sub-plot treatments:

2 methods of application: M<sub>1</sub>=Soil application and M<sub>2</sub>=Spray application.

3. **DESIGN:**

(i) Split-plot.  (ii) 9 main-plots/replication ; 2 sub-plots/main-plot.  (b) N.A. (iii) 4.  (iv) (a) 19.5'x19.5'.

(b) 1/160 ac.  (v) N.A. (vi) Yes.

4. **GENERAL:**

(i) Normal.  (ii) Early blight in severe form and late blight was moderate. Frost effect severe in some plots. Sprays were given against blights and aphids. (iii) Tuber yield. (iv) (a) and (b) No.  (c) Nil.  (v) (a) Babugarh and Patna.  (b) Nil.  (vi) N.A.  (vii) Nil.
5. RESULTS:
(i) 6.37 tons/acre.  (ii) 1.39 tons/acre.  (iii) Main effect of M and interactions M×N and M×P are highly significant. The interaction M×N×P is significant.  (iv) Av. yield of tuber in tons/acre.

<table>
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<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
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S.E. of difference of two
1. N or P marginal means  = 0.40 tons/acre.
2. M marginal means  = 0.17 tons/acre.
3. M means at the same level of N or P  = 0.79 tons/acre.
4. N or P means at the same level of M  = 0.45 tons/acre.
S.E. of the body of N×P table  = 0.49 tons/acre.

Crop: Potato.  Ref: C.P.R.I. 59(41).
Site: Potato Expt. and Trial Centre, Jullundur.  Type: ‘M’.

Object: To study the effect of N, P and K as soil and foliar applications on Potato.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Sandy loam.  (c) Nil.  (ii) (a) Sandy loam.  (b) Refer soil analysis, C.P.R.I., Jullundur.  (iii) 16.10.1959.  (iv) (a) to (e) N.A.  (v) Nil.  (vi) Up-to-date.  (vii) 3 crust breakings 3 weeding and 1 earthing.  (ix) 2.24 x (x) 14.2.1960.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1), (2) and (3)
(1) 2 levels of N as Urea: N₀ = 0 and N₁ = 100 lb/acre.
(2) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 100 lb/acre.
(3) 2 levels of K₂O as Pos. Sul.: K₀ = 0 and K₁ = 100 lb/acre.

Sub-plot treatment:
2 methods of application: M₄ = Soil application and M₆ = Spray (foliar) application.
Spray application given at the rate of half of the dose applied to soil divided in four equal doses. First spray applied when plants were 4” to 5” high and subsequent doses at 7 day’s intervals. Super was neutralised with lime before application.

3. DESIGN:
(i) Split-plot.  (ii) (a) 8 main-plots/replcation; 2 sub-plots/main-plot.  (b) 156’ x 39’.  (iii) 4.  (iv) (a) 19.5’ x 19.5’.  (b) 16.5’ x 16.5’.  (v) 1.5’ x 1.5’.  (vi) Yes.

4. GENERAL:
(i) Normal.  (ii) Early blight was severe and late blight and frost were moderate. Virus was also observed. Sprays of Bordeaux mixture and Basudin were given to check the diseases.  (iii) Rate of germination, growth data and yield of tubers.  (iv) (a) 1958—coated.  (b) No.  (c) Nil.  (v) and (vi) N.A.  (vii) Two way table for PK is N.A.

5. RESULTS:
(i) 3.48 tons/acre.  (ii) 0.89 tons/acre.  (b) 0.89 tons/acre.  (iii) None of the effects is significant.  (iv) Av. yield of tuber in tons/acre.
Crop :- Potato (Rabi).

Site :- Central Potato Res. Sta., Patna.

Object :- To try the commercial fertilizer mixtures containing N, P and K in different ratios against A/S.

1. BASAL CONDITIONS:
   (i) N.A.
   (ii) Sandy loam.
   (b) Refer soil analysis, Patna.
   (iii) 7.11.1958.
   (iv) (a) 4 ploughings.
   (b) and (c) N.A.
   (d) 18° x 9°.
   (e) 1.
   (v) G.M.
   (vi) Kufired.
   (vii) Irrigated.
   (viii) 1 earthing.
   (ix) N.A.
   (x) 25 and 27.2.1959.

2. TREATMENTS:
   Same as in exp. no. 58(103) on page 159.
   Manures applied on 6.11.1958.

3. DESIGN:
   (i) R.B.D. (ii) (a) 13.
   (b) N.A. (iii) 5.
   (iv) (a) 10° x 12°.
   (b) 7° x 10°.
   (v) 1.5° x 9°.
   (vi) Yes.

4. GENERAL:
   (i) Good.
   (ii) N.A.
   (iii) Yield of tubers
   (iv) (a) 1957—1959.
   (b) Nil.
   (c) Nil.
   (v) (a) Jullundur and Babugarh.
   (b) Nil.
   (vi) Nil.
   (vii) Mean yield of control is N.A.

5. RESULTS:
   (i) N.A.
   (ii) 11.00 tons/ac.
   (iii) None of the effect is significant.
   (iv) Av. yield of tubers in tons/ac.

Control — N.A.

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S.E. of N marginal mean = 2.46 tons/ac.
S.E. of S marginal mean = 2.84 tons/ac.
S.E. of body of table = 4.52 tons/ac.

Ref:- C.P.R.I. 58(112)
Type :- 'M'.
Crop: Potato (Rabi).  
Site: Central Potato Res. Sta., Patna.  
Ref: C.P.R.I. 59(103).

Object: To try the commercial fertilizer mixtures containing N, P and K in different ratios against A/S.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Maize + Cowpea (fodder) (c) A/S. (ii) (a) Loam. (b) Refer soil analysis, C.P.R.S., Patna.  
   (iii) 5 and 6.11.1959. (iv) (a) 3 ploughings, cross ploughings and 3 plankings. (b) Ridge and furrow method.  
   (c) 18 mds./ac. (d) 14" x 9". (e) I. (v) Nil. (vi) Kufri red. (vii) Irrigated. (viii) 1 weeding and 1 earthing.  

2. TREATMENTS:
   Same as in exp. no. 59(93) on page 160.

3. DESIGN:
   (i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 13" x 12". (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Fungicide spray against late blight. (iii) Yield of tubers. (iv) (a) 1957—1959. (b) No.  
   (c) Nil. (v) (a) Julundur and Babugarh. (b) Nil. (vi) Nil. (vii) Control yield in N.A.

5. RESULTS:
   (i) N.A. (ii) 0.63 tons/ac. (iii) Main effect of N and 'control vs. others' are highly significant. (iv) Av. yield of tubers in tons/ac.

<table>
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</table>

S.E. of N marginal mean = 0.16 tons/ac.
S.E. of S marginal mean = 0.28 tons/ac.
S.E. of body of table = 0.14 tons/ac.

Crop: Potato (Rabi).  
Site: Central Potato Res. Sta., Patna.  
Ref: C.P.R.I. 57(101).

Object: To study the effect of soil and spray application of N and P on Potato.

1. BASAL CONDITIONS:
   (i) (a) Fallow—Potato. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.S., Patna.  
   (iii) N.A. (iv) (a) 3 ploughings and 3 cross ploughings each followed by planking. (b) In ridges and furrows.  
   (c) 26 mds./ac. (d) 18" x 9". (e) N.A. (v) N.A. (vi) Kufri red. (vii) Irrigated. (viii) 2 earthings. (ix) and (x) N.A.

2. TREATMENTS:
   (a) Main-plot treatments: M1 = Soil application and M2 = Spray (foliar) application.
   (b) Sub-plot treatments:
      All combinations of (1) and (2)
      (1) 3 levels of N as A/S: N0 = 0, N1 = 50 and N2 = 100 lb/ac.
      (2) 3 levels of P2O5 as Super: P0 = 0, P1 = 50 and P2 = 100 lb/ac.
3. DESIGN:
   (i) Split-plot. (ii) 2 main-plots/replication : 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 15'x15' 
   (b) 14'3"x12', (v) 1.5'x9'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of tubers. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullandur and 
   Babugarh. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3.11 ton/ac. (ii) (a) 1.18 tons/ac. (b) 0.57 tons/ac. (iii) Main effect of $M$, $N$ and interactions $N \times P$, 
   $M \times N$ and $M \times P$ are highly significant. Interaction $M \times N \times P$ is significant. (iv) Av. yield of tuber in 
   tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>$N_0$</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>Mean</th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
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<td>4.44</td>
<td>5.02</td>
<td>3.93</td>
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<td>2.02</td>
<td>2.88</td>
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<tr>
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<td>3.52</td>
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</table>

S.E. of difference of two
1. M marginal means = 0.28 tons/ac.
2. N or P marginal means = 0.16 tons/ac.
3. N or P means at the same level of M = 0.23 tons/ac.
4. M means at the same level of N or P = 0.34 tons/ac.
S.E. of body of $N \times P$ table = 0.20 tons/ac.

---

Site : Central Potato Res. Stn., Patna. Type : M'.
Object : To study the effect of soil and spray application of $N$ and $P$ on Potato.

1. BASAL CONDITIONS :
   (i) (a) Fallow—Potato.  (b) Fallow.  (c) Nil.  (ii) (a) Sandy loam.  (b) Refer soil analysis, C.P.R.S., 
   Patna.  (iii) N.A.  (iv) (a) 3 ploughings and 3 cross ploughings each followed by planking.  (b) 
   Ridge and furrow method.  (c) 26 mds./ac.  (d) 1.5'x9'.  (e) N.A.  (f) Nil.  (vi) Up-to-date.  (vi) 
   Irrigated.  (vi) 4 weedings and 2 earthings.  (ix) and (x) N.A.

2. TREATMENTS :
   Main-plot treatments :
   2 methods of application : $M_1$ = Soil application and $M_2$ = Spray application.
   Sub-plot treatments :
   All combinations of (1) and (2)
   (1) 3 levels of $N$ as (A/S+Urea) : $N_0$=0, $N_1$=50 and $N_2$=100 lb./ac.
   (2) 3 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=50 and $P_2$=100 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) 2 main-plots/replication : 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 
   1/160 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of tubers. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullandur 
   and Babugarh. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 3.52 tons/ac. (ii) 0.68 tons/ac. (b) 0.60 tons/ac. (iii) Main effect of M and interaction M×N are highly significant. Main effect of N is significant. (iv) Av. yield of tubers in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>P₀</th>
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<td>P₂</td>
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<td>3.69</td>
<td>3.48</td>
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</tbody>
</table>

S.E. of difference of two

1. M marginal means = 0.16 tons/ac.
2. N or P marginal means = 0.17 tons/ac.
3. N or P means at the same level of M = 0.21 tons/ac.
4. M means at the same level of N or P = 0.26 tons/ac.

S.E. of body of N×P table = 0.21 tons/ac.

---

Crop: Potato (Rabi).

Site: Central Potato Res. Sta., Patna.

Object: To study the effect of soil and spray application of N and P on Potato.

1. BASAL CONDITIONS:

(ii) (a) Fallow—Potato. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Patna. (iii) 12 and 13.11.1959. (iv) (a) 3 ploughings and 3 cross ploughings each followed by a planking. (b) Ridges and furrows method. (c) 26 mds/ac. (d) 14'x9'. (e) N.A. (v) Nil. (vi) Upto-date (improved, early). (vii) Irrigated. (viii) 1 weeding and 1 earthing. (ix) 8.49% (x) 18 to 20.2.1960.

2. TREATMENTS:

Main-plot treatments:
All combinations of (1), (2) and (3)
(1) 2 levels of N as A/S+Urea: N₀=0 and N₁=100 lb./ac.
(2) 2 levels of P₀O₄ as Super: P₀=0 and P₁=100 lb./ac.
(3) 2 levels of K₀ as Pot. Sul.: K₀=0 and K₁=100 lb./ac.

Sub-plot treatments:
2 methods of application: M₁=Soil application and M₂=Spray (foliar) application.

3. DESIGN:

(i) Split-plot. (ii) (a) 8 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 16'x15'. (b) 13'x13'. (v) 1.5'x9'. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Cutworm, fungicidal sprays against late blight. (iii) Yield of tubers. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullundur and Bahubagh. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 3.63 tons/ac. (ii) 0.75 tons/ac. (b) 0.70 tons/ac. (iii) Main effects of N, M and interaction N×M are highly significant. Interactions P×K and N×K are significant. (iv) Av. yield of tubers in tons/ac.
Crop : Potato (Rabi).
Site : Central Potato Res. Sta., Patna.
Type : 'M'.

Object : To study the effect of micro-nutrient elements on growth and yield of Potato.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 4.11.1957. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) 1'x9'.
   (e) N.A. (v) G.M. with saw hemp, 6 mdst./ac. of A/S half at the time of planting and the remaining half at the time of earthing up a d 66 mdst./ac. of Super at planting. (vi) D.R.R. (vii) Irrigated. (viii) Earthing up on 18.12.1957. (ix) N.A. (x) 24.3.1958.

2. TREATMENTS:
   All combinations of (1), (2), (3), (4), (5) and (6)
   (1) 2 levels of B : B0 ~0 lb./ac. and B1 ~10 lb./ac.
   (2) 2 levels of Mn : Mn0 ~0 and Mn1 ~10 lb./ac.
   (3) 2 levels of Zn : Zn0 ~0 and Zn1 ~4 lb./ac.
   (4) 2 levels of Cu : Cu0 ~0 and Cu1 ~2 lb./ac.
   (5) 2 levels of Mo : Mo0 ~0 and Mo1 ~4 lb./ac.
   (6) 2 levels of Fe : Fe0 ~0 and Fe1 ~20 lb./ac.

3. DESIGN:
   (i) 28 Fact. (ii) (a) 8 plots/block ; 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 12'x14'. (b) 9'x12'.
   (v) 1'x9'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) No. (iii) Yield of tuber. (iv) (a) 1957-1959. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 13423 lb./ac. (ii) 2932.0 lb./ac. (iii) None of the effects is significant. (iv) Table of mean and differential responses in lb./ac.
Differential response

<table>
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<tr>
<th>Elements</th>
<th>Mean response</th>
<th>B</th>
<th>Mn</th>
<th>Zn</th>
<th>Cu</th>
<th>Mo</th>
<th>Fe</th>
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</thead>
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<td></td>
<td>–</td>
<td>+</td>
<td>–</td>
<td>+</td>
<td>–</td>
<td>+</td>
<td>–</td>
</tr>
<tr>
<td>B</td>
<td>–</td>
<td>–</td>
<td>423</td>
<td>–</td>
<td>–</td>
<td>–</td>
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</tr>
<tr>
<td>Mn</td>
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<td>262</td>
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<td>333</td>
<td>48</td>
<td>242</td>
<td>129</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

S.E. of mean response = 733.0 lb./ac.
S.E. of differential response = 1036.5 lb./ac.

Crop: Potato (Rabi).
Site: Central Potato Res. Stn., Patna.
Ref: C.P.R.I. 58(111).
Type: ‘M’.

Object: To study the effect of various micro-nutrient elements as foliar spray on Potato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Patna. (iii) 4.11.1958. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) 1¼ x 9”. (e) N.A. (v) G.M. with sunnhemp. A/S applied at 6 mds./ac. half at planting and half at the time of earthing up and Super applied at 6 mds./ac. at the time of planting. (vi) N.A. (vii) Irrigated. (viii) 1 earthing. (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2), (3), (4), (5) and (6)
   (1) 2 levels of Boron as Boric acid: B₀ = 0 and B₁ = 10 lb./ac.
   (2) 2 levels of Manganese as Manganese Sul.: M₀ = 0 and M₁ = 10 lb./ac.
   (3) 2 levels of Zinc as Zn. Sul.: Z₀ = 0 and Z₁ = 4 lb./ac.
   (4) 2 levels of Cu as C/S: C₀ = 0 and C₁ = 2 lb./ac.
   (5) 2 levels of Molybdenum as Ammonium molybdate: N₀ = 0 and N₁ = 4 lb./ac.
   (6) 2 levels of Iron as Ferrous sulphate: F₀ = 0 and F₁ = 20 lb./ac.

3. DESIGN:
   (i) 2² confd. (ii) (a) 8 plots/block; 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 15’ x 15’. (b) 12’ x 13½’. (v) 1½’ x 9”. (vi) Yes.

4. GENERAL:

5. RESULTS:
   (i) 7.48 tons/ac. (ii) 1.12 tons/ac. (iii) No effect is significant. (iv) Table of mean and differential responses in tons/ac.
Object: To study the effect of various micro-nutrient elements as foliar spray on Potato yield.

1. BASAL CONDITIONS:
   (i) (a) Fallow-Potato. (b) Fallow. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Patna. (iii) 3.11.1959. (iv) (a) 3 ploughings and cross ploughings each followed by planking. (b) Ridge and furrows method. (c) 18 mds/ac. (d) 11'x19'. (e) N.A. (v) 150 lb/ac. of A/8+75 lb/ac. of phosphoric acid as Super+100 lb/ac. of potash as Pot. Sul. (vi) Kufri red. (vii) Irrigated. (viii) 1 weeding and 1 earthing. (ix) 8.49'. (x) 5, 6, 8.2.1960.

2. TREATMENTS:
   All combinations of (1), (2), (3), (4), (5) and (6)
   (1) 2 levels of Boron as Boric acid; \( B_0 = 0 \) and \( B_1 = 0.375\% \) sol. of Boric acid.
   (2) 2 levels of Manganese as Manganese Sul.: \( M_0 = 0 \) and \( M_1 = 0.375\% \) sol. of Manganese Sul.
   (3) 2 levels of Zinc as Zn. Sul.: \( Z_0 = 0 \) and \( Z_1 = 0.15\% \) sol. of Zn. Sul.
   (4) 2 levels of Cu as C/S: \( C_0 = 0 \) and \( C_1 = 0.075\% \) sol. of C/S.
   (5) 2 levels of Molybdenum as Ammonium molybdate: \( N_0 = 0 \) and \( N_1 = 0.15\% \) sol. of Ammonium molybdate.
   (6) 2 levels of Iron as Ferrous sulphate: \( F_0 = 0 \) and \( F_1 = 0.75\% \) sol. of Ferrous sulphate.

3. DESIGN:
   (i) 26 Conf. (ii) [a] 8 plots/block; 8 blocks/replication. (b) N.A. (iii) 1, (iv) (a) 15'x15'. (b) 12'x13'. (v) 1'6"x9'. (vi) N.A.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Yield of potato. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 5.26 tons/ac. (ii) 0.61 tons/ac. (iii) Main effect of C and interactions F\( \times M \) and F\( \times C \) are significant. (iv) Table of mean and differential responses in tons/ac.
Differential response

<table>
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<th>Factors</th>
<th>Mean response</th>
<th>B</th>
<th>M</th>
<th>Z</th>
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<tr>
<td>B</td>
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<tr>
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<td>-0.26</td>
<td>-</td>
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<tr>
<td>C</td>
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<td>-0.01</td>
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<tr>
<td>F</td>
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<td>0.09</td>
<td>-0.37</td>
<td>0.32</td>
<td>-0.08</td>
<td>0.01</td>
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</tbody>
</table>

S.E. of mean response = 0.15 tons/ac.
S.E. of differential response = 0.21 tons/ac.

Crop: Potato (Rabi).
Site: Central Potato Res. Stn., Babugarh.
Ref: C.P.R.I. 58(101).
Object: To study the response of important commercial varieties and promising hybrids to Potash fertilizers.

1. BASAL CONDITIONS:
   (i) to (v) N.A. (vi) As per treatments. (vii) to (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   6 varieties: V₁ = ON.-1360, V₂ = ON.-2236, V₃ = Up-to-date, V₄ = Craig's Defiance, V₅ = Kufri red and V₆ = Kufri Safeda.
   Sub-plot treatments:
   4 levels of K₂O as Pot. Sol.: K₀ = 0, K₁ = 50, K₂ = 100 and K₃ = 150 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/160 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of tuber. (iv) (a) and (b) No. (c) Nil. (iv) (a) Jullundur and Patna. (b) Nil. (v) N.A. (vi) Nil.

5. RESULTS:
   (i) 9.66 tons/ac. (ii) (a) 2.81 tons/ac. (b) 0.94 tons/ac. (iii) Main effect of K is highly significant and interaction V × K is significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
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<td>11.90</td>
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<td>9.84</td>
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</table>

Mean 10.46 8.56 11.58 9.04 9.66 8.66 9.06
Object:—To study the response of important commercial varieties and promising hybrids to Potash fertilizers.

1. **BASAL CONDITIONS:**
   (i) to (v) N.A. (vi) As per treatments. (vii) to (x) N.A.

2. **TREATMENTS:**
   **Main-plot treatments:**
   4 varieties: V₁=0N.-1360, V₂=0N.-2136, V₃=Up-to-date and V₄=Ku'ri-red.
   **Sub-plot treatments:**
   4 levels of K₂O: K₀=0, K₁=75, K₂=150 and K₃=225 lb./ac.

3. **DESIGN:**
   (i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 19' x 19', (b) 16' x 16'. (v) 1.5' x 1.5'. (vi) Yes.

4. **GENERAL:**
   (i) and (ii) N.A. (iii) Yield of tuber. (iv) (a) and (b) No. (c) Nil. (v) (a) Jullundur and Patna. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 12.00 tons/ac. (ii) (a) 2.33 tons/ac. (b) 1.86 tons/ac. (iii) Only main effect of V is significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
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<tr>
<td>Mean</td>
<td>11.77</td>
<td>12.10</td>
<td>12.29</td>
<td>12.45</td>
<td>12.00</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. V marginal means = 0.82 tons/ac.
2. K marginal means = 0.66 tons/ac.
3. K means at the same level of V = 1.31 tons/ac.
4. V means at the same level of K = 1.40 tons/ac.

---

**Crop:** Potato

**Site:** Central Potato Res. Sta., Babugarh.

**Ref:** C.P.R.L. 59(90).

**Type:** ‘MV’.

---

**Crop:** Potato

**Site:** Potato Exptl. and Trial Centre, Jullundur.

**Ref:** C.P.R.L. 58(45).

**Type:** ‘MV’.

Object:—To study the response of important commercial varieties and promising hybrids to Potash fertilizers.
1. BASAL CONDITIONS:
   (i) (a) and (b) Sannemp. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Jullundur. (iii) 16.10.1958. (iv) (a) 1 tractor ploughing, 2 plankings and 1 discing. (b) By hand. (c) 15 to 20 mds./ac. (d) 21°×9°. (e) 1. (v) 2 mds./ac. of Pot. Sul. was applied in bands below seed places at the time of planting. (vi) As per treatments. (vii) Irrigated. (viii) 3 crust breakings, 3 weedings and 1 earthing. (ix) 4.96°. (x) 7.3.1959.

2. TREATMENTS:
   Same as in expt. no. 58(101) on page 175.

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 19.5'×19.5'. (b) 16.5'×16.5'. (v) 1.5'×1.5'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Severe attack of early blight and moderate attack of late blight were observed. Spraying was done against aphids and blights with Basudin and Bordeaux mixture. Interval of irrigation was reduced to 3 days when frost was severe. (iii) Yield of tuber. (iv) (a) 1958-1959. (b) No. (c) Nil. (v) (a) Babugarh and Patna. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 6.14 tons/ac. (ii) (a) 1.32 tons/ac. (b) 0.80 tons/ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.76</td>
<td>5.06</td>
<td>6.05</td>
<td>7.23</td>
<td>6.76</td>
<td>5.51</td>
<td>5.90</td>
</tr>
<tr>
<td>6.29</td>
<td>5.88</td>
<td>6.07</td>
<td>6.59</td>
<td>6.89</td>
<td>6.43</td>
<td>6.36</td>
</tr>
<tr>
<td>6.29</td>
<td>5.60</td>
<td>5.85</td>
<td>7.56</td>
<td>7.01</td>
<td>5.01</td>
<td>6.22</td>
</tr>
<tr>
<td>4.89</td>
<td>5.63</td>
<td>6.24</td>
<td>6.61</td>
<td>7.40</td>
<td>5.56</td>
<td>6.06</td>
</tr>
<tr>
<td>Mean</td>
<td>5.56</td>
<td>5.54</td>
<td>6.05</td>
<td>7.01</td>
<td>7.02</td>
<td>5.63</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 0.47 tons/ac.
2. K marginal means = 0.23 tons/ac.
3. K means at the same level of V = 0.57 tons/ac.
4. Y means at the same level of K = 0.68 tons/ac.

---

**Crop:** Potato.  
**Ref:** C.P.R.I. 59(42).  
**Site:** Potato Exptl. and Trial Centre, Jullundur.  
**Type:** "MV".

Object:—To study the response of some of the important commercial varieties and promising hybrids to Potash fertilizers.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Sannemp. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Jullundur. (iii) 18.10.1959. (iv) (a) 1 tractor ploughing, 2 plankings and 1 discing. (b) By hand. (c) 15 to 20 mds./ac. (d) 21°×9°. (e) 1. (v) 250 mds./ac. of F.Y.M. (vi) As per treatments. (vii) Irrigated. (viii) 3 crust breakings, 3 weedings and 1 earthing. (ix) 4.17°. (x) 28.3.1960.

2. TREATMENTS:
   **Main-plot treatments:**
   - 6 varieties: V1=ON.—1360, V2=ON.—2236, V3=Up-to-date, V4=Craigs Defiance, V5=Kufri R'ed and V6=Kufri safeda.

   **Sub-plot treatments:**
   - 4 levels of K2O as Pot. Sul.: K0=0, K1=75, K2=150 and K3=225 lb./ac.  
Fertilizers applied on 18.10.1959.
3. DESIGN and 4. GENERAL:
Same as in expt. no. 58(45) on page 176.

5. RESULTS:
(i) 6.11 tons/ac. (ii) (a) 1.35 tons/ac. (b) 1.10 tons/ac. (iii) Main effect of V and K are highly significant and interaction $V \times K$ is significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>$V_4$</th>
<th>$V_5$</th>
<th>$V_6$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$K_1$</td>
<td>6.24</td>
<td>3.65</td>
<td>6.24</td>
<td>6.46</td>
<td>9.09</td>
<td>6.73</td>
<td>6.40</td>
</tr>
<tr>
<td>$K_2$</td>
<td>6.30</td>
<td>3.93</td>
<td>6.29</td>
<td>5.86</td>
<td>10.01</td>
<td>7.03</td>
<td>6.40</td>
</tr>
<tr>
<td>Mean</td>
<td>5.71</td>
<td>3.59</td>
<td>5.45</td>
<td>6.19</td>
<td>8.42</td>
<td>7.30</td>
<td>6.11</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. $V$ marginal means $= 0.48$ tons/ac.
2. $K$ marginal means $= 0.32$ tons/ac.
3. $K$ means at the same level of $V = 0.78$ tons/ac.
4. $V$ means at the same level of $K = 0.63$ tons/ac.

Crop :- Potato (Rabi).
Site :- Central Potato Res. Stn., Patna.
Ref :- C.P.R.I. 58(110).
Type :- 'MV'.

Object :- To study the effect of K on different varieties of Potato.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Patna. (iii) N.A. (iv) (a) 2 ploughings and 1 cross ploughing. (b) Ridge and furrow method. (c) N.A. (d) 18' x 9'. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 1 earthing. (ix) and (x) N.A.

2. TREATMENTS:
Same as in expt. no. 58(101) on page 175.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 4 (iv) (a) 15' x 10'. (b) 13' x 10'. (c) N.A. (v) 7.5' x 1.5'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of tuber. (iv) (a) 1957-1959. (b) No. (c) Nil. (v) (a) Jullundur and Babarpur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 8.02 tons/ac. (ii) (a) 2.62 tons/ac. (b) 0.68 tons/ac. (iii) Main effects of $V$, $K$ and interaction $V \times K$ are highly significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>$V_4$</th>
<th>$V_5$</th>
<th>$V_6$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$K_1$</td>
<td>7.86</td>
<td>7.66</td>
<td>9.94</td>
<td>5.25</td>
<td>9.17</td>
<td>7.26</td>
<td>7.86</td>
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<tr>
<td>$K_2$</td>
<td>8.19</td>
<td>7.97</td>
<td>10.52</td>
<td>5.64</td>
<td>9.99</td>
<td>8.15</td>
<td>8.41</td>
</tr>
<tr>
<td>$K_3$</td>
<td>9.65</td>
<td>9.22</td>
<td>9.88</td>
<td>5.98</td>
<td>9.93</td>
<td>6.52</td>
<td>8.33</td>
</tr>
<tr>
<td>Mean</td>
<td>8.12</td>
<td>8.08</td>
<td>9.74</td>
<td>5.49</td>
<td>9.38</td>
<td>7.14</td>
<td>8.02</td>
</tr>
</tbody>
</table>
S.E. of difference of two

1. V marginal means = 0.93 tons/acre.
2. K marginal means = 0.20 tons/acre.
3. K means at the same level of V = 0.48 tons/acre.
4. V means at the same level of K = 1.02 tons/acre.

**Crop:** Potato (Rabi).

**Ref:** C.P.R.I. 59(100).

**Site:** Central Potato Res. Stn., Patna.

**Type:** MV.

Object: To find out the potash needs for different varieties of Potato.

1. **BASAL CONDITIONS:**
   (i) (a) Fallow—Potato. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Patna. (iii) 6 and 7.11.1959. (iv) (a) 3 ploughings and cross ploughings each followed by planking. (b) Ridges and furrow method. (c) V1 ~22, V2 ~24, V3 ~26, V4 ~20, V5 ~18 and V6 ~16 mds./ac. (d) 2' × 9'. (e) N.A. (v) 6 mds./ac. of N as A/S-6 mds./ac. of P2O5 as Super applied as band placement in rows below seed just before sowing. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding and 1 earthing. (ix) 8.49°. (x) 15 to 17.11.1959.

2. **TREATMENTS:**
   Same as in expl. no. 59(42) on page 177.

3. **DESIGN:**
   (i) Split-plot. (ii) (a) 6 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10' × 15'. (b) 7' × 13'. (v) 1.5' × 9'. (vi) Yes.

4. **GENERAL:**
   (i) Stand of crop was good except in V6 in which the seed was extremely heterogeneous and the quantity was poor. Growth satisfactory. (ii) Attack of cut worm. Fungicidal spray against late blight. (iii) Yield of tubers. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullundur and Babugarh. (b) Nil. (vi) and (vii) Kil.

5. **RESULTS:**
   (i) 4.98 tons/acre. (ii) (a) 1.35 tons/acre. (b) 0.70 tons/acre. (iii) Main effects of V and K are highly significant. (iv) Av. yield of tubers in tons/acre.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>K0</td>
<td>4.76</td>
<td>4.38</td>
<td>4.76</td>
<td>2.99</td>
<td>4.69</td>
<td>3.74</td>
</tr>
<tr>
<td>K1</td>
<td>5.17</td>
<td>6.43</td>
<td>5.82</td>
<td>4.39</td>
<td>4.97</td>
<td>3.86</td>
</tr>
<tr>
<td>K2</td>
<td>4.75</td>
<td>6.04</td>
<td>6.07</td>
<td>4.22</td>
<td>5.81</td>
<td>4.04</td>
</tr>
<tr>
<td>K3</td>
<td>5.73</td>
<td>6.42</td>
<td>6.81</td>
<td>3.76</td>
<td>5.80</td>
<td>4.08</td>
</tr>
<tr>
<td>Mean</td>
<td>5.10</td>
<td>5.82</td>
<td>5.86</td>
<td>3.84</td>
<td>5.32</td>
<td>3.93</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. V marginal means = 0.48 tons/acre.
2. K marginal means = 0.20 tons/acre.
3. K means at the same level of V = 0.49 tons/acre.
4. V means at the same level of K = 0.64 tons/acre.

**Crop:** Potato (Rabi).

**Ref:** C.P.R.I. 57(99).

**Site:** Central Potato Res. Stn., Patna.

**Type:** C.

Object: To find out the most effective method of planting Potato.
1. **BASAL CONDITIONS**:
   (i) to (v) N.A. (vi) Up-to-date. (vii) Irrigated. (viii) 1 weeding and 1 earthing. (ix) and (x) N.A.

2. **TREATMENTS**:
   6 methods of planting: $M_1$ = Planting in flat, $M_2$ = Babugarh system, $M_3$ = Jullundur double row system, $M_4$ = Planting in the centre of the ridge, $M_5$ = Planting on the north side of the ridge and $M_6$ = Planting on the south side of the ridge.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 22' x 17'². (v) Nil. (vi) Yes.

4. **GENERAL**:
   (i) Good. (ii) N.A. (iii) Yield of tuber. (iv) (a) 1957-1959. (b) Nil. (v) (a) Jullundur and Patna. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS**:
   (i) 7.72 tons/acre. (ii) 0.72 tons/acre. (iii) Treatment differences are highly significant. (iv) Av. yield of tuber in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
<th>$M_5$</th>
<th>$M_6$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>6.73</td>
<td>8.48</td>
<td>8.14</td>
<td>7.92</td>
<td>7.31</td>
<td>7.52</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.29 tons/acre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop**: Potato (*Rabi*).
**Site**: Central Potato Res. Stn., Babugarh.
**Object**: To find out the most effective method of planting Potato.

Ref: C.P.R.I. 58(107).

**Crop**: Potato (*Rabi*).
**Site**: Central Potato Res. Stn., Babugarh.
**Object**: To find out the most effective method of planting Potato.

Ref: C.P.R.I. 39(87).

**Crop**: Potato (*Rabi*).
**Site**: Central Potato Res. Stn., Babugarh.
**Object**: To find out the most effective method of planting Potato.

Ref: C.P.R.I. 59(97).
5. RESULTS:
(i) 11.97 tons/ac. (ii) 1.66 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>11.63</td>
<td>12.48</td>
<td>11.88</td>
<td>12.71</td>
<td>10.98</td>
<td>12.13</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.68 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop:** Potato.  
**Site:** Potato Exptl. and Trial Centre, Jullundur.  
Type := 'C'.  
Ref := C.P.R.L 58(50).

Object := To find out the most effective method of planting Potato.

1. **BASAL CONDITIONS:**
(i) (a) N.A. (b) Sandhemp. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.L, Jullundur. (iii) 24.10.1958. (iv) (a) 1 tractor ploughing, 2 plankings and 1 discing. (b) By hand. (c) 15 to 20 mds/ac. (d) 21' x 9'. (e) 1. (v) 6 mds/ac. each of C/A/N and Super were applied in bands below seed at planting. (vi) Kufri-red. (vii) Irrigated. (viii) 3 crust breakings, 3 weedings and 1 earthing. (ix) 4.88'. (x) 6.2.1959.

2. **TREATMENTS:**
5 methods of planting: M₁ = Jullundur double row, M₂ = Babugarh method, M₃ = Planting in flat, M₄ = Dibbling in centre, M₅ = Dibbling in north side of ridge and M₆ = Dibbling in south side of ridge.

3. **DESIGN:**
(i) R.B.D. (ii) 6. (b) 18.5' x 39'. (iii) 6. (iv) (a) 19½' x 19½'. (b) 16½' x 16½'. (v) 1.5' x 1.5'. (vi) Yes.

4. **GENERAL:**
(i) Normal. (ii) Attack of early blight was severe. Attack of late blight was moderate and frost was slight. Spraying of Bordeaux mixture and Basudin were given against blight and aphids. (iii) Tuber yield. (iv) (a) 1958-1959. (b) No. (c) Nil. (v) (a) Babugarh and Patna. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**
(i) 6.54 tons/ac. (ii) 1.00 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>8.12</td>
<td>5.44</td>
<td>5.82</td>
<td>6.70</td>
<td>6.82</td>
<td>6.35</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.41 tons/ac.</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Crop:** Potato.  
**Site:** Potato Exptl. and Trial Centre, Jullundur.  
Type := 'C'.  
Ref := C.P.R.L 59(47).

Object := To find out the most effective method of planting Potato.

1. **BASAL CONDITIONS:**
(i) (a) N.A. (b) Sandhemp. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.L, Jullundur. (iii) 23.10.1959. (iv) (a) 1 tractor ploughing, 2 plankings and 1 discing. (b) By hand. (c) 15 to 20 mds/ac. (d) 21' x 9'. (e) 1. (v) 6 mds/ac. each of C/A/N and Super were applied in bands below seed at planting. (vi) Kufri-red. (vii) Irrigated. (viii) 3 crust breakings, 3 weedings and 1 earthing. (ix) 4.17'. (x) 5.4.1960.

**TREATMENTS to 4.** **GENERAL:**
Same as in exp. no. 58(50) above.
5. RESULTS:
(i) 10.32 tons/ac.  (ii) 2.41 tons/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>10.06</td>
<td>11.56</td>
<td>9.44</td>
<td>11.60</td>
<td>9.86</td>
<td>9.39</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=</td>
<td>0.98 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Potato (Rabi).
Site :- Central Potato Res. Sta., Patna.
Object :- To find out the best method of planting Potato.

1. BASAL CONDITIONS:
(i) (a) Sannhemp-Potato.  (b) Sannhemp.  (c) Nil.  (ii) (a) Sandy loam.  (b) Refer soil analysis, C.P.R.S. Patna.  (iii) 24.11.1979.  (iv) (a) 3 ploughings and cross ploughings, each ploughing was followed by planking.  (b) In ridges and furrows.  (c) 26 mds./ac.  (d) 15' x 9'.  (e) 1.  (v) 8 mds./ac. of A/S-1/5 mds./ac. of Super and was applied as band placement just before planting in rows below seeds.  (iv) Kufri red.  (vii) Irrigated.  (viii) 1 weeding and 1 earthing.  (ix) 8.49% (x) 1 and 2.3.1960.

2. TREATMENTS:
6 methods of planting: M₁=Double row Jullundur system (21' between rows). M₂=Dibbling of tubers on north side of ridge and irrigating it immediately after planting. M₃=Dibbling of tubers on south side of ridge and irrigating it immediately after planting. M₄=Dibbling of tubers in centre side of ridge and irrigating it immediately after planting. M₅=Planting of tubers at optimum soil moisture condition and irrigating it after complete germination (Babugarh system) and M₆=Planting of tubers on flat at optimum soil moisture and ridge after complete germination.

3. DESIGN:
(i) R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 15' x 15'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) Good.  (ii) Attack of cut worm.  Fungicidal sprays as precautionary measures against late blight.  (iii) Yield of tubers.  (iv) (a) and (b) No.  (c) Nil.  (v) (a) Jullundur and Babugarh.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
(i) 6.28 tons/ac.  (ii) 0.65 tons/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of tubers in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
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<tr>
<td>Av. yield</td>
<td>5.75</td>
<td>5.96</td>
<td>6.32</td>
<td>5.89</td>
<td>6.92</td>
<td>6.83</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=</td>
<td>0.32 tons/ac.</td>
<td></td>
<td></td>
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<td></td>
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</table>

Crop :- Potato (Rabi).
Site :- Central Potato Res. Sta., Babugarh.
Object :- To find out the best method of planting Potato.

1. BASAL CONDITIONS:
(i) and (ii) N.A.  (iii) As per treatments.  (iv) and (v) N.A.  (vi) As per treatments.  (vii) Irrigated.  (viii) and (ix) N.A.  (x) As per treatments.
2. TREATMENTS:

Main-plot treatments:
2 varieties: $V_1 = \text{Up-to-date}$ and $V_2 = \text{Kufri-red}$.

Sub-plot treatments:

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots replication, 14 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/160 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of potato. (iv) (a) 1957—1959. (b) N.A. (c) Nil. (v) and (vi) Nil. (vii) $D_2$ and $D_{14}$ were dropped from the analysis.

5. RESULTS:
(i) 7.74 tons/acre. (ii) (a) 1.83 tons/acre. (b) 1.21 tons/acre. (iii) Main effect of D and interaction VxD are highly significant. (iv) Av. yield of tuber in tons/acre.

<table>
<thead>
<tr>
<th></th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>$D_3$</th>
<th>$D_4$</th>
<th>$D_5$</th>
<th>$D_6$</th>
<th>$D_7$</th>
<th>$D_8$</th>
<th>$D_9$</th>
<th>$D_{10}$</th>
<th>$D_{11}$</th>
<th>$D_{12}$</th>
<th>$D_{13}$</th>
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<tbody>
<tr>
<td>$V_1$</td>
<td>6.92</td>
<td>12.97</td>
<td>12.37</td>
<td>10.13</td>
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<td>5.88</td>
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<td>4.59</td>
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<td></td>
</tr>
<tr>
<td>Mean</td>
<td>5.05</td>
<td>13.65</td>
<td>13.38</td>
<td>11.45</td>
<td>10.18</td>
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<td>6.20</td>
<td>3.68</td>
<td>3.63</td>
<td>3.45</td>
<td>7.24</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. $V$ marginal means $= 0.37$ tons/acre.
2. $D$ marginal means $= 0.60$ tons/acre.
3. $D$ means at the same level of $V = 0.86$ tons/acre.
4. $V$ means at the same level of $D = 0.09$ tons/acre.

---

Crop: Potato.
Site: Central Potato Res. Stn., Babugarh.
Ref: C.P.R.R. 59(95).
Type: 'CV'.

Object: To study the effect of different dates of sowing on different varieties of Potato.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) As per treatments. (iv) and (v) N.A. (vi) As per treatments. (vii) to (x) N.A.

2. TREATMENTS:
Main-plot treatments: 2 varieties: $V_1 = \text{Up-to-date}$ and $V_2 = \text{Kufri-red}$.


C.S.: Cold storage seed and H.S.: Hill seed.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 10 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/160. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of potato. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Jullundur and Patna. (b) N.A. (v) and (vii) Nil.
5. RESULTS:

(i) 6.05 tons/ac.  (ii) (a) 1.01 tons/ac.  (b) 1.91 tons/ac.  (iii) Main effect of D is highly significant and interaction D×V is significant.  (iv) Av. yield of potato in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>D_1</th>
<th>D_2</th>
<th>D_3</th>
<th>D_4</th>
<th>D_5</th>
<th>D_6</th>
<th>D_7</th>
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<tbody>
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<td>3.74</td>
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<td>V_2</td>
<td>3.62</td>
<td>7.38</td>
<td>8.20</td>
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<td>2.37</td>
</tr>
<tr>
<td>Mean</td>
<td>2.61</td>
<td>5.56</td>
<td>8.13</td>
<td>9.54</td>
<td>10.53</td>
<td>5.57</td>
<td>6.72</td>
<td>5.12</td>
<td>2.74</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 0.23 tons/ac.
2. D marginal means = 0.98 tons/ac.
3. D means at the same level of V = 1.38 tons/ac.
4. V means at the same level of D = 1.33 tons/ac.

---

**Crop:** Potato (Rabi).  
**Site:** Central Potato Res. Stn., Babugarh.  
**Ref:** C.P.R.I. 53(106).  
**Type:** 'CV'.

Object: To study the tuber initiation in different Potato varieties.

1. BASAL CONDITIONS:
   (i) 19 to 25, 10, 1938.  (iv) (a) N.A.  (b) As per treatments.
   (v) Irrigated.  (vi) N.A.  (vii) N.A.  (viii) N.A.  (ix) N.A.  (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   6 varieties: V_1=ON.—2186, V_2=ON.—2216, V_3=Kufri red, V_4=UP-947, V_5=ON.—2217 and V_6=ON.—1350.
   Sub-plot treatments:
   8 durations of crop: D_1=50, D_2=50, D_3=70, D_4=80, D_5=90, D_6=100, D_7=110 and D_8=120 days.

3. DESIGN:
   (i) Split-plot.  (ii) 6 main-plots/replication; 5 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) Yes.

4. GENERAL:
   (i) Normal.  (ii) N.A.  (iii) Yield of potato.  (i) (a) 1937—1959.  (b) No.  (c) Nil.  (v) N.A.

5. RESULTS:

(i) 4.01 tons/ac.  (ii) (a) 1.12 tons/ac.  (b) 0.51 tons/ac.  (iii) Main effect of D and interaction V×D are highly significant.  (iv) Av yield of potato in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>D_1</th>
<th>D_2</th>
<th>D_3</th>
<th>D_4</th>
<th>D_5</th>
<th>D_6</th>
<th>D_7</th>
<th>D_8</th>
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<tr>
<td>V_1</td>
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<td>2.68</td>
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<tr>
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<td>V_3</td>
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<td>5.00</td>
<td>4.94</td>
<td>5.40</td>
<td>4.01</td>
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</table>
S.E. of difference of two
1. $V$ marginal means = 0.28 tons/ac.
2. $D$ marginal means = 0.15 tons/ac.
3. $D$ means at the same level of $V$ = 0.36 tons/ac.
4. $V$ means at the same level of $D$ = 0.44 tons/ac.

---

**Crop :- Potato (Rabi).**

**Site :- Central Potato Res. Stn., Babugarh.**

**Object :-** To study the tuber initiation in different Potato varieties.

1. **BASAL CONDITIONS :**
   (i) to (iii) N.A. (iv) (a) N.A. (b) Ridges and furrow method. (c) N.A. (d) 18°×9°. (e) N.A. (f) N.A. (g) N.A. (h) As per treatments. (i) Irrigated. (ii) 2 weedings and 1 earthing. (j) N.A. (k) As per treatments.

2. **TREATMENTS :**
   **Main-plot treatments :**
   5 varieties : $V_1$ = ON-2236, $V_2$ = ON-1360, $V_3$ = Up-to-date, $V_4$ = Great scot and $V_5$ = Kufri-red.
   **Sub-plot treatments :**
   8 durations of crop : $D_1$ = 50, $D_2$ = 60, $D_3$ = 70, $D_4$ = 80, $D_5$ = 90, $D_6$ = 100, $D_7$ = 110 and $D_8$ = 120 days.

3. **DESIGN :**
   (i) R.B.D. (ii) (a) 5 main-plots/replication ; 8 sub-plots/main-plots. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/160 ac. (v) N.A. (vi) Yes.

4. **GENERAL :**
   Same as in exp. no. 58(106) on page 181.

5. **RESULTS :**
   (i) 3.05 tons/ac. (ii) (a) 1.53 tons/ac. (b) 0.53 tons/ac. (iii) Main effect of $D$ and interaction $V \times D$ are highly significant and main effect of $V$ is significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>$D_3$</th>
<th>$D_4$</th>
<th>$D_5$</th>
<th>$D_6$</th>
<th>$D_7$</th>
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<td>2.53</td>
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<td>3.51</td>
<td>4.98</td>
<td>5.07</td>
<td>5.18</td>
<td>3.59</td>
</tr>
<tr>
<td>$V_2$</td>
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<td>2.59</td>
<td>3.16</td>
<td>4.17</td>
<td>4.79</td>
<td>5.39</td>
<td>4.60</td>
<td>3.25</td>
</tr>
<tr>
<td>$V_3$</td>
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<td>3.39</td>
<td>3.83</td>
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<td>4.46</td>
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<td>$V_4$</td>
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<td>1.84</td>
<td>2.08</td>
<td>2.21</td>
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<td>2.57</td>
<td>2.11</td>
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<tr>
<td>$V_5$</td>
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<td>3.02</td>
<td>3.60</td>
<td>4.17</td>
<td>4.35</td>
<td>4.52</td>
<td>3.05</td>
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</table>

S.E. of difference of two
1. $V$ marginal means = 0.54 tons/ac.
2. $D$ marginal means = 0.24 tons/ac.
3. $D$ means at the same level of $V$ = 0.53 tons/ac.
4. $V$ means at the same level of $D$ = 0.73 tons/ac.

---

**Crop :- Potato (Rabi).**

**Site :- Central Potato Res. Stn., Babugarh.**

**Ref :- C.P.R.I. 57(98).**

**Type :- ‘CV’.**

**Object :-** To study the effect on the yield of Potato of different sizes of the tuber of different varieties.
1. BASAL CONDITIONS:
   (i) to (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:

   Main-plot treatments:
   3 varieties: \( V_1 = \text{Kufri-red} \), \( V_2 = \text{Old} \), \( V_3 = \text{Up-to-date} \).

   Sub-plot treatments:
   7 sizes of tuber: \( S_1 = \frac{1}{4} \) ozs., \( S_2 = \frac{1}{2} \) ozs., \( S_3 = \frac{1}{4} \) ozs., \( S_4 = \frac{1}{2} \) ozs., \( S_5 = \frac{3}{4} \) ozs., \( S_6 = 1 \) ozs., \( S_7 = 1 \frac{1}{2} \) ozs.

   \( S_1 \) to \( S_4 \) were sown as whole tuber and \( S_5 \) to \( S_7 \) as cut tuber.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 13' x 17'. (b) 10' x 16'. (v) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of tuber. (iv) (a) 1957-1959. (b) Nil. (v) (a) Jullundur and Patna. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 6.68 tons/ac. (ii) 2.94 tons/ac. (b) 2.25 tons/ac. (iii) Interaction \( V \times S \) alone is highly significant. (iv) Av. yield of tuber in tons/ac.

\[
\begin{array}{cccccccc}
S_1 & S_2 & S_3 & S_4 & S_5 & S_6 & S_7 & \text{Mean} \\
V_1 & 5.57 & 5.95 & 7.26 & 9.70 & 6.00 & 5.54 & 8.75 & 6.97 \\
V_2 & 9.40 & 9.07 & 2.44 & 2.86 & 5.97 & 6.10 & 2.32 & 3.45 \\
V_3 & 7.67 & 7.89 & 8.83 & 10.08 & 5.37 & 6.66 & 6.67 & 7.62 \\
\text{Mean} & 7.55 & 7.64 & 6.18 & 7.55 & 5.85 & 6.10 & 5.91 & 6.68 \\
\end{array}
\]

S.E. of difference of two
1. V marginal means = 0.79 tons/ac.
2. S marginal means = 0.92 tons/ac.
3. V means at the same level of S = 1.59 tons/ac.
4. V means at the same level of S = 1.67 tons/ac.

---

Crop: Potato (Rabi).
Site: Central Potato Res. Sta., Babugarh.
Ref: C.P.R.I. 58(104).
Type: \( \cdot CV \cdot \).

Object: To study the effect of whole and cut tubers on the growth and yield of different varieties of Potato.

1. BASAL CONDITIONS:
   (i) to (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 1 earthing. (ix) and (x) N.A.

2. TREATMENTS:

   Main-plot treatments:
   3 varieties: \( V_1 = \text{Kufri-red} \), \( V_2 = \text{Old} \), \( V_3 = \text{Up-to-date} \).

   Sub-plot treatments:
   7 sizes of tuber: \( S_1 = \frac{1}{4} \) ozs., \( S_2 = \frac{1}{2} \) ozs., \( S_3 = \frac{1}{4} \) ozs., \( S_4 = \frac{1}{2} \) ozs., \( S_5 = \frac{3}{4} \) ozs., \( S_6 = 1 \) ozs., \( S_7 = 1 \frac{1}{2} \) ozs.

   \( S_1 \) to \( S_4 \) were sown as whole tuber and \( S_5 \) to \( S_7 \) as cut tuber.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/160 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Yield of tubers. (iv) (a) 1957-1959. (c) No. (e) Nil. (v) (a) Jullundur and Patna. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 9.92 tons/ac.  (ii) (a) 6.08 tons/ac. (b) 2.11 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
<th>S7</th>
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<tbody>
<tr>
<td>V1</td>
<td>11.56</td>
<td>12.95</td>
<td>11.81</td>
<td>11.31</td>
<td>11.03</td>
<td>11.28</td>
<td>11.40</td>
</tr>
<tr>
<td>V2</td>
<td>9.39</td>
<td>8.84</td>
<td>10.08</td>
<td>10.40</td>
<td>6.88</td>
<td>8.89</td>
<td>8.33</td>
</tr>
</tbody>
</table>

Mean 9.69  10.51  10.88  10.43  8.37  9.23  10.28  9.92

S.E. of difference of two

1. $V$ marginal means
2. $S$ marginal means
3. $S$ means at the same level of $V$
4. $V$ means at the same level of $S$

Crop :- Potato (Rabi).

Site :- Central Potato Res. Sta., Babugarh.

Ref:- C.P.R.I. 59(94).

Type :- 'CV'.

Object :- To study the effect of whole tubers and cut tubers on the growth and yield of different varieties of Potato.

1. BASAL CONDITIONS:

(i) to (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 2 earthing. (ix) and (x) N.A.

2. TREATMENTS:

Main-plot treatments:

3 varieties: $V_1$ = Kufri-safa, $V_2$ = Up-to-date and $V_3$ = Kufri-red.

Sub-plot treatments:

7 sizes of tuber: $S_1 = \frac{1}{4}$ ozs., $S_2 = \frac{1}{2}$ ozs., $S_3 = 1$ ozs., $S_4 = 1\frac{1}{2}$ ozs., $S_5 = 2$ ozs., $S_6 = 4$ ozs. and $S_7 = 1$ ozs.

$S_1$ to $S_4$ were sown as whole tubers and $S_5$ to $S_7$ as cut tubers.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/160 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Yield of tuber. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullundur and Patna. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 4.32 tons/ac. (ii) (a) 0.71 tons/ac. (b) 1.50 tons/ac. (iii) Main effects of $V$ and $S$ are highly significant and interaction $V \times S$ is significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
<th>S7</th>
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</tr>
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<td>3.07</td>
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<tr>
<td>V2</td>
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<td>5.05</td>
<td>3.62</td>
<td>1.87</td>
<td>2.53</td>
<td>2.09</td>
</tr>
<tr>
<td>V3</td>
<td>5.87</td>
<td>7.13</td>
<td>6.74</td>
<td>7.14</td>
<td>1.06</td>
<td>3.21</td>
<td>6.18</td>
</tr>
</tbody>
</table>

Mean 5.11  5.31  5.35  5.46  2.02  2.94  4.05  4.32
Crop :- Potato (Rabi).
Site :- Central Potato Res. Stn., Babugarh.

Ref :- C.P.R.I. 59(39).
Type :- 'CV'.

Object :- To find out optimum time of planting of different varieties of Potato during main crop period.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) As per treatments. (iv) and (v) N.A. (vi) As per treatments. (vii) to (x) N.A.

2. TREATMENTS:
Main-plots treatments:
2 varieties: V1 = Up-to-date and V2 = Kafrired.
Sub-plot treatments:

For D1 to D5 cold storage seed was used and for D6, D7 to D9 seed used was hill seed.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication; 10 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/160 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of tubers. (iv) (a) 1557 -1959. (b) No. (c) Nil. (v) (a) Jullundur and Patna. (b) Nil. (vi) and (vii) N.A.

5. RESULTS:
(i) 6.07 tons/ac. (ii) (a) 1.03 tons/ac. (b) 1.96 tons/ac. (iii) Main effect of D is highly significant and interaction V x D is significant. (iv) Av. yield of tubers in tons/ac.

<table>
<thead>
<tr>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
<th>D8</th>
<th>D9</th>
<th>D10</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>1.61</td>
<td>3.74</td>
<td>8.66</td>
<td>7.31</td>
<td>10.06</td>
<td>5.70</td>
<td>6.62</td>
<td>6.13</td>
<td>5.08</td>
<td>5.74</td>
</tr>
<tr>
<td>V2</td>
<td>3.62</td>
<td>7.83</td>
<td>8.20</td>
<td>11.97</td>
<td>11.01</td>
<td>5.45</td>
<td>6.83</td>
<td>4.11</td>
<td>2.37</td>
<td>2.98</td>
</tr>
<tr>
<td>Mean</td>
<td>2.62</td>
<td>5.56</td>
<td>8.13</td>
<td>9.64</td>
<td>10.54</td>
<td>5.58</td>
<td>6.72</td>
<td>5.12</td>
<td>2.74</td>
<td>6.07</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 0.23 tons/ac.
2. D marginal means = 0.58 tons/ac.
3. D means at the same level of V = 1.39 tons/ac.
4. V means at the same level of D = 1.33 tons/ac.

Crop :- Potato.
Site :- Potato Exptl. and Trial Centre, Jullundur.

Ref :- C.P.R.I. 59(39).
Type :- 'CV'.

Object :- To find out the optimum time of planting of different varieties of Potato during main crop season.
1. BASAL CONDITIONS:

(i) (a) N.A. (b) Sundarban. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) As per treatments. (iv) (a) 1 tractor ploughing, 2 plankings, 2 tillerings and 1 discing. (b) By hand. (c) 15 to 20 mds./ac. (d) 21" x 9'.

(e) (i) 6 mds./ac. of each C/A/N and Super at the time of planting. (ii) As per treatments. (iii) Irrigated. (iv) 3 crust breakings, 4 weedings and 1 earthing. (v) 4.10'. (vi) 1.5. (vii) 6 mds./ac. of each C/A/N and Super at the time of planting. (viii) As per treatments. (ix) Irrigated. (x) 3 crust breakings, 4 weedings and 1 earthing. (xi) 4.10'. (xii) 1.5. (xiii) 1.5. x 1.5'. (xiv) Yes.

2. TREATMENTS:

Main-plot treatments:
- 2 varieties: V1 = Up-to-date and V2 = Kuri-red.

Sub-plot treatments:

For D1 to D3 cold storage seed was used and for D7, D9 to D11 seed used was hill seed.

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/replication; 11 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 19.5' x 19.5'. (b) 16.5' x 16.5. (v) 1.5' x 1.5'. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Early blight observed in severe form, late blight observed in moderate form. Moderate frost effect was observed. (iii) Tuber yield. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) Babughar and Patna. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 3.96 tons/ac. (ii) (a) 1.94 tons/ac. (b) 1.10 tons/ac. (c) Nil. (d) (a) 3.96 tons/ac. (ii) 1.94 tons/ac. (iii) Main effect of D alone is highly significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
<th>D8</th>
<th>D9</th>
<th>D10</th>
<th>D11</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>0.98</td>
<td>0.12</td>
<td>5.47</td>
<td>9.32</td>
<td>6.74</td>
<td>4.56</td>
<td>1.71</td>
<td>4.33</td>
<td>1.79</td>
<td>1.24</td>
<td>1.74</td>
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<tr>
<td>V2</td>
<td>1.35</td>
<td>0.60</td>
<td>10.13</td>
<td>10.92</td>
<td>7.76</td>
<td>4.97</td>
<td>3.30</td>
<td>4.93</td>
<td>2.06</td>
<td>1.63</td>
<td>1.42</td>
</tr>
<tr>
<td>Mean</td>
<td>1.16</td>
<td>0.36</td>
<td>7.80</td>
<td>10.12</td>
<td>7.25</td>
<td>4.76</td>
<td>2.52</td>
<td>4.63</td>
<td>1.92</td>
<td>1.44</td>
<td>1.58</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. V marginal means = 0.41 tons/ac.
2. D marginal means = 0.55 tons/ac.
3. D means at the same level of V = 0.78 tons/ac.
4. V means at the same level of D = 0.85 tons/ac.

_Crop:_ Potato. 
_Ref:_ C.P.R.I. 58(49). 
_Site:_ Potato Fxptl. and Trial Centre, Jullundur. 
_Type:_ 'CV'.

Object: To find out the optimum duration of different commercial varieties of Potato.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Sundarban. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 13 and 14.10.1958. (iv) (a) 1 tractor ploughing and 2 plankings. (b) By hand. (c) 15 to 20 mds./ac. (d) 21" x 9'. (e) 1. (f) 250 mds./ac. of F.Y.M. applied 1 month before planting. (vi) As per treatments. (vii) Irrigated. (viii) Mulching every 10 days, 1 earthing up and 1 spraying. (ix) 4.88'. (x) Harvesting at 10 days intervals from 3.12.1958 to 14.2.1959.
2. TREATMENTS:

Main-plot treatments:
8 varieties: 
- $V_1 = \text{Up-to-date}$
- $V_2 = \text{CD.}$
- $V_3 = \text{ON-45}$
- $V_4 = \text{ON-2287}$
- $V_5 = \text{PS-309}$
- $V_6 = \text{Kufri-red}$
- $V_7 = \text{ON-1360}$
- $V_8 = \text{Kufri-kuber}$

Sub-plot treatments:
8 durations of cropping: 
- $D_1 = 50$
- $D_2 = 60$
- $D_3 = 70$
- $D_4 = 85$
- $D_5 = 90$
- $D_6 = 103$
- $D_7 = 110$
- $D_8 = 120$ days

3. DESIGN:

(i) Split-plot. (ii) 8 main-plots/replication; 8 sub-plots/main-plot. (iii) N.A. (iv) 19.5' x 19.5'. (v) 1.5' x 1.5'. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Attack of blight and severe effect of first spraying done against blight aphids. (iii) Yield of potato. (iv) (a) 1957–contd. (b) Nil. (v) (a) Rsbugah and Patras. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 4.81 tons/ac. (ii) (a) 1.47 tons/ac. (b) 1.12 tons/ac. (iii) $V$ and $D$ effects and interaction $V \times D$ are highly significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>$V_4$</th>
<th>$V_5$</th>
<th>$V_6$</th>
<th>$V_7$</th>
<th>$V_8$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>1.27</td>
<td>2.49</td>
<td>0.17</td>
<td>1.62</td>
<td>0.41</td>
<td>0.61</td>
<td>1.32</td>
<td>0.62</td>
</tr>
<tr>
<td>D2</td>
<td>2.67</td>
<td>3.98</td>
<td>1.08</td>
<td>2.69</td>
<td>1.43</td>
<td>1.42</td>
<td>2.61</td>
<td>1.19</td>
</tr>
<tr>
<td>D3</td>
<td>3.17</td>
<td>4.94</td>
<td>1.98</td>
<td>4.31</td>
<td>2.90</td>
<td>2.36</td>
<td>4.33</td>
<td>3.33</td>
</tr>
<tr>
<td>D4</td>
<td>5.29</td>
<td>6.43</td>
<td>4.20</td>
<td>5.14</td>
<td>4.48</td>
<td>4.29</td>
<td>6.20</td>
<td>5.21</td>
</tr>
<tr>
<td>D5</td>
<td>5.09</td>
<td>8.14</td>
<td>5.96</td>
<td>5.18</td>
<td>5.46</td>
<td>5.34</td>
<td>6.95</td>
<td>5.90</td>
</tr>
<tr>
<td>D6</td>
<td>6.94</td>
<td>8.87</td>
<td>5.67</td>
<td>5.72</td>
<td>6.36</td>
<td>6.02</td>
<td>6.01</td>
<td>8.09</td>
</tr>
<tr>
<td>D7</td>
<td>7.06</td>
<td>7.89</td>
<td>7.39</td>
<td>6.42</td>
<td>5.73</td>
<td>6.21</td>
<td>7.31</td>
<td>7.95</td>
</tr>
<tr>
<td>D8</td>
<td>7.37</td>
<td>8.40</td>
<td>8.23</td>
<td>5.75</td>
<td>6.44</td>
<td>7.10</td>
<td>6.75</td>
<td>7.34</td>
</tr>
</tbody>
</table>

Crop : Potato (Rabi).
Site : Potato Exptl. and Trial Centre, Jullundur.
Type : 'CV'.

Object : To find the optimum duration on different commercial varieties of Potato.
3. DESIGN:
(i) Split-plot. (ii) (a) 7 main-plots/replication; 8 sub-plots/main-plot. (b) 56/115 ac. (iii) 4. (iv) (a) 19.5'x19.5'. (b) 16.5'x16.5', (v) 1'x1'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Severe attack of early blight and damage due to frost. Control measures - N.A. (iii) Germination count, height/plant, and yield. (iv) (a) 19.5'x19.5'. (b) 16.5'x16.5'. (v) 1'x1'. (vi) Yes.

5. RESULTS:
(i) 4.11 tons/ac. (ii) (a) 1.13 tons/ac. (b) 0.82 tons/ac. (iii) All effects are highly significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
<th>D8</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>0.92</td>
<td>2.42</td>
<td>3.89</td>
<td>4.97</td>
<td>5.70</td>
<td>6.63</td>
<td>6.97</td>
<td>6.31</td>
<td>4.73</td>
</tr>
<tr>
<td>V2</td>
<td>0.44</td>
<td>1.76</td>
<td>2.73</td>
<td>3.93</td>
<td>5.24</td>
<td>5.35</td>
<td>6.08</td>
<td>6.58</td>
<td>4.01</td>
</tr>
<tr>
<td>V3</td>
<td>0.44</td>
<td>1.71</td>
<td>2.65</td>
<td>4.55</td>
<td>4.66</td>
<td>5.97</td>
<td>5.87</td>
<td>6.74</td>
<td>4.07</td>
</tr>
<tr>
<td>V4</td>
<td>0.84</td>
<td>2.02</td>
<td>2.66</td>
<td>2.13</td>
<td>3.00</td>
<td>4.64</td>
<td>5.40</td>
<td>4.37</td>
<td>3.13</td>
</tr>
<tr>
<td>V5</td>
<td>0.44</td>
<td>1.80</td>
<td>2.36</td>
<td>5.66</td>
<td>7.11</td>
<td>7.41</td>
<td>9.84</td>
<td>9.50</td>
<td>5.53</td>
</tr>
<tr>
<td>V6</td>
<td>0.56</td>
<td>1.59</td>
<td>2.73</td>
<td>3.63</td>
<td>4.30</td>
<td>4.61</td>
<td>5.70</td>
<td>5.40</td>
<td>3.56</td>
</tr>
</tbody>
</table>

Mean: 0.61, 1.88, 3.00, 4.14, 5.00, 5.77, 6.49, 6.48, 4.17

S.E. of difference of two
1. V marginal means = 0.28 tons/ac.
2. D marginal means = 0.24 tons/ac.
3. D means at the same level of V = 0.53 tons/ac.
4. V means at the same level of D = 0.61 tons/ac.

Crop: Potato. Ref: C.P.R.I. 58(45).
Site: Potato Exptl. and Trial Centre, Jullundur. Type: ‘CV’.

Object: To study the effect of whole and cut tubers on the growth and yield of Potato.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Sainshemp. (c) Nil. (d) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Jullundur. (ii) 23.10.1958. (iii) (a) 1 tractor ploughing, 2 plankings, 2 tillerings and 1 discing. (b) By hand. (c) 15 to 20 mds./ac. (d) 21'x136.5'. (e) 6 mds./ac. each of C/A/N and Super applied at the time of planting. (vi) As per treatments. (vii) Irrigated. (viii) Crop breaking and 3 weedings, 1 earthing up. (ix) 4.9'. (x) 18.2 1959.

2. TREATMENTS:
Main-plot treatments:
8 varieties: V1=Up-to-date, V3=Craig’s Defiance and V5=Kufri-red.
Sub-plot treatments:
7 sizes of tuber: S1=0.5, S2=1.0, S3=1.5, S4=2.0, S5=0.5, S6=1.0 and S7=1.5 ozs.
S1 to S5 were sown as whole tubers and S6 to S7 as cut tubers.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 7 sub-plots/main-plot. (b) 58.5'x136.5'. (iii) 4. (iv) (a) 19.5'x19.5'. (b) 16.5'x16.5'. (c) 1.5'x1.5'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Severe attack of early blight. Spraying of Bordeaux mixture + Basudin were given against blights and aphids. Irrigation interval was reduced against frost. (iii) Rate of germination, growth data, no. of plants at harvest and yield of tuber. (iv) (a) 1958—1959. (b) No. (c) Nil. (d) NIL. (e) Balangach and Patna. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 6.59 tons/ac.  (ii) (a) 1.18 tons/ac.  (b) 0.96 tons/ac.  (iii) Main effects of S, V and interaction S\times V are highly significant. (iv) Av. yield of tuber in tons/ac.

\[
\begin{array}{cccccccc}
S_1 & S_2 & S_3 & S_4 & S_5 & S_6 & S_7 & \text{Mean} \\
V_1 & 3.17 & 5.92 & 1.16 & 6.44 & 1.12 & 7.17 & 8.03 & 4.72 \\
V_2 & 5.89 & 7.35 & 4.52 & 8.40 & 5.13 & 9.17 & 9.25 & 7.10 \\
V_3 & 7.36 & 7.73 & 5.48 & 8.54 & 6.94 & 10.07 & 9.13 & 7.95 \\
\text{Mean} & 5.47 & 7.00 & 3.72 & 7.93 & 4.40 & 8.80 & 8.80 & 6.59 \\
\end{array}
\]

S.E. of difference of two:
1. V marginal means = 0.22 tons/ac.
2. S marginal means = 0.19 tons/ac.
3. S means at the same level of V = 0.68 tons/ac.
4. V means at the same level of S = 0.70 tons/ac.

---

Crop :- Potato,  
Ref :- C.P.R.I. 59(48).  
Site :- Potato Exptl. and Trial Centre, Jullundur.  
Type :- 'CV'.

Object :- To study the effect of whole and cut tubers on the growth and yield of Potato.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) Sandy loam.  (c) Nil.  (ii) (a) Sandy loam.  (b) Refer soil analysis, C.P.R.I., Jullundur.  (iii) 23.10.1959.  (iv) (a) 1 tractor ploughing, 2 plankings, 2 tillingings and 1 discing.  (b) By hand.  (c) 15 to 20 mds./ac.  (d) 21'x9'.  (e) 1.  2. (a) I tractor ploughing, 2 plankings, 2 tillerings and 1 discing.  (b) By hand.  (c) 15 to 20 mds./ac.  (d) 21'x9'.  (e) 1.  3. (a) 19.5'x19.5'.  (b) 165'><16.5'x16.5'.  (c) 1.5'x1.5'.  (vi) Yes.

2. TREATMENTS:
   Main-plot treatments:  3 varieties: V_1=Up-to-date, V_2=Kufri-red and V_3=Craigs Defiance.
   Sub-plot treatments:  7 sizes cf tuber: S_1=0.5, S_2=1.0, S_3=1.5, S_4=2, S_5=0.5, S_6=1.0 and S_7=1.5 ozs.
   S_1 to S_4 were sown as whole tubers and S_6 to S_7 as cut tubers.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 3 main-plots/replication ; 7 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 19.5'x19.5'.  (b) 16.5'x16.5'.  (c) 1.5'x1.5'.  (vi) Yes.

4. GENERAL:
   (i) Normal except cut tubers of V_3.  (ii) Early blight was severe, late blight and frost moderate.  Sprays of Bordeaux mixture and Basudin were given against blights and aphids. Irrigation interval was reduced when frost was severe.  (iii) Tubar yield.  (iv) 1958—1959.  (b) No.  (c) Nil.  (d) Patna and Babugarh.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 7.34 tons/ac.  (ii) (a) 1.30 tons/ac.  (b) 1.64 tons/ac.  (iii) Main effects of V and S are highly significant.  (iv) Av. yield of tuber in tons/ac.

\[
\begin{array}{cccccccc}
S_1 & S_2 & S_3 & S_4 & S_5 & S_6 & S_7 & \text{Mean} \\
V_1 & 5.56 & 8.05 & 9.14 & 10.02 & 4.89 & 7.18 & 5.11 & 7.14 \\
V_2 & 8.76 & 11.11 & 10.65 & 10.54 & 7.67 & 7.96 & 8.57 & 9.32 \\
V_3 & 6.13 & 7.90 & 8.82 & 8.59 & 1.30 & 3.04 & 2.67 & 5.56 \\
\text{Mean} & 6.82 & 9.02 & 9.54 & 9.72 & 4.79 & 6.06 & 5.45 & 7.34 \\
\end{array}
\]
Crop: Potato (Rabi).  
Site: Central Potato Res. Stn., Patna.

Object: To study the tuber initiation in different varieties of Potato.

1. BASAL CONDITIONS:

   (i) (a) Sanbhemp—Potato. (b) Sanbhemp. (c) Nil. (II) (a) Loamy. (b) Refer soil analysis, C.P.R.S., Patna. (iii) N.A. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) $18' \times 9'$. (e) N.A. (v) G.M.+6 mds/ac. of A/S half at the time of planting and half at the time of earthing up+6 mds/ac. of Super at the time of planting. (vi) N.A. (vii) Irrigated. (viii) 2 weedings and 2 earthings. (ix) and (x) N.A.

2. TREATMENTS:

   Multi-plot treatments:
   - 8 varieties: $V_1$ = ON-2287, $V_2$ = CD., $V_3$ = ON-2236, $V_4$ = Up-to-date, $V_5$ = ON-1360, $V_6$ = ON-1373, $V_7$ = ON-45 and $V_8$ = Kufri-red.
   - Sub-plot treatments:
     - 6 durations of crop: $D_1$ = 75, $D_2$ = 82, $D_3$ = 89, $D_4$ = 96, $D_5$ = 103 and $D_6$ = 110 days.

3. DESIGN:

   (i) Split-plot. (ii) (a) 8 main-plots/replcation; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) $15' \times 10'$. (b) $12' \times 9'$. (v) $1.5' \times 9'$. (vi) Yes.

4. GENERAL:

   (i) Satisfactory. (ii) Fungicide spray as protection measure against late blight. (iii) Yield of tuber. (iv) (a) 1957-1959. (b) No. (c) Nil. (vi) (a) Jull undor and Babughar. (b) Nil. (vii) and (vii) Nil.

5. RESULTS:

   (i) 9.08 tons/ac. (ii) 1.47 tons/ac. (b) 1.40 tons/ac. (iii) All the effects and interactions are highly significant. (iv) Av. yield of tuber in tons/ac:

<table>
<thead>
<tr>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>$V_4$</th>
<th>$V_5$</th>
<th>$V_6$</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>8.02</td>
<td>9.32</td>
<td>7.38</td>
<td>7.56</td>
<td>8.80</td>
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<td>9.80</td>
</tr>
<tr>
<td>7.39</td>
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<td>8.92</td>
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<td>11.48</td>
<td>12.21</td>
<td>9.15</td>
</tr>
<tr>
<td>11.17</td>
<td>10.38</td>
<td>8.90</td>
<td>7.86</td>
<td>9.28</td>
<td>11.92</td>
<td>8.85</td>
</tr>
<tr>
<td>10.49</td>
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<td>9.28</td>
<td>9.06</td>
<td>11.06</td>
<td>9.43</td>
</tr>
<tr>
<td>10.71</td>
<td>11.43</td>
<td>7.76</td>
<td>10.28</td>
<td>10.32</td>
<td>8.22</td>
<td>8.73</td>
</tr>
</tbody>
</table>

   Mean: 9.19 9.91 8.10 8.37 9.77 10.63 8.87 7.81

   S.E. of difference of two
   1. $V$ marginal means = 0.49 tons/ac.
   2. $D$ marginal means = 0.40 tons/ac.
   3. $D$ means at the same level of $V$ = 1.14 tons/ac.
   4. $V$ means at the same level of $D$ = 1.13 tons/ac.
Crop: Potato (Rabi).
Site: Central Potato Res. Sta., Patna.
Ref: C.P.R.I. 57(104).
Type: 'CGV'.

Object: To study the effect of whole and cut tubers on the growth and yield of Potato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.S. Patna. (iii) 6/11.1957. (iv) (a) 3 ploughings followed by planking. (b) Ridge and furrow method. (c) N.A. (d) 18°×9°. (e) N.A. (f) G.M. with Sarsenp+6 mds/ac. of A/S half at the time of planting and half at the time of earthing up+6 mds/ac. of Super at the time of planting. (vii) As per treatments. (viii) Irrigated. (ix) N.A. (x) 15/16.4.1958.

2. TREATMENTS:
   Main-plot treatments:
   3 varieties:
   V1 = O-1360, V2 = Kufri Red and V3 = Up-to-date.

   Sub-plot treatments:
   7 seed sizes:
   S1 = 1 oz., S2 = 1 oz., S3 = 1 oz., S4 = 1 oz., S5 = 1 oz., S6 = 1 oz. and S7 = 1 oz.

3. DESIGN:
   (i) Split-plot. (ii) (a) 1 main-plots/replication; 7 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 10'×14'. (b) 7'×12'. (v) 1.5'×9'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of tuber. (iv) (a) 1957-1959. (b) No. (c) Nil. (v) (a) Jullunder and Babugarh. (b) Nil. (vii) and (vii) Nil.

5. RESULTS:
   (i) 5.28 tons/ac. (ii) (a) 1.80 tons/ac. (b) 0.88 tons/ac. (iii) Only main effect of S is highly significant.
   (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
<th>S7</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>V1</td>
<td>4.78</td>
<td>6.43</td>
<td>6.41</td>
<td>6.04</td>
<td>4.27</td>
<td>5.79</td>
<td>5.40</td>
</tr>
<tr>
<td>V2</td>
<td>5.77</td>
<td>5.63</td>
<td>5.08</td>
<td>5.76</td>
<td>4.57</td>
<td>5.40</td>
<td>5.18</td>
</tr>
<tr>
<td>V3</td>
<td>4.38</td>
<td>4.81</td>
<td>5.05</td>
<td>6.73</td>
<td>4.17</td>
<td>4.21</td>
<td>4.93</td>
</tr>
</tbody>
</table>

Mean: 4.98 5.62 5.52 6.18 4.34 5.14 5.17

S.E. of difference of two
1. V marginal means = 0.56 tons/ac.
2. S marginal means = 0.41 tons/ac.
3. S means at the same level of V = 0.72 tons/ac.
4. V means at the same level of S = 0.87 tons/ac.

Crop: Potato (Rabi).
Site: Central Potato Res. Sta., Patna.
Ref: C.P.R.I. 58(113).
Type: 'CV'.

Object: To find out the smallest seed size which will give the maximum yield.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Clayey loam. (b) Refer soil analysis, C.P.R.S., Patna. (iii) 8.11.1958. (iv) (a) 3 ploughings. (b) Ridge and furrow method. (c) N.A. (d) 14°×9°. (e) N.A. (f) G.M. +6 mds/ac. of A/S half at the time of earthing and other half of A/S and 6 mds/ac. of Super at the time of planting. (vii) Irrigated. (vii) 1 earthing. (ix) N.A. (x) 27 and 28.2.1959.
2. TREATMENTS:

Main-plot treatments:
3 varieties: V₁=ON-2236, V₂=Kufri red and V₃=Up-to-date.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 types of tuber: T₁=Whole and T₂=Cut tuber.
(2) 3 seed sizes: S₁=½  and S₂=1 oz and S₃=1½ oz.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12' x 12', (b) 9' x 10', (c) 14' x 9', (d) Yes. (v) 12'.

4. GENERAL:
Same as in expt. no. 57(104) on page 194.

5. RESULTS:
(i) 6.55 tons/ac. (ii) (a) 2.31 tons/ac. (b) 1.01 tons/ac. (iii) Main effects of T, S and interaction V x T are highly significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>T₁</th>
<th>T₂</th>
<th>Mean</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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<tbody>
<tr>
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<td>5.21</td>
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<td>5.68</td>
<td>6.23</td>
</tr>
<tr>
<td>V₂</td>
<td>7.72</td>
<td>6.28</td>
<td>7.00</td>
<td>6.61</td>
<td>7.45</td>
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<td>5.99</td>
<td>6.79</td>
<td>6.39</td>
<td>5.77</td>
<td>6.67</td>
</tr>
<tr>
<td>Mean</td>
<td>7.01</td>
<td>6.09</td>
<td>6.55</td>
<td>6.02</td>
<td>6.45</td>
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<tr>
<td>S₁</td>
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</tr>
<tr>
<td>S₂</td>
<td>6.70</td>
<td>6.19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S₃</td>
<td>7.30</td>
<td>6.89</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 0.77 tons/ac. 5. V means at the same level of T = 0.84 tons/ac.
2. T marginal means = 0.27 tons/ac. 6. S means at the same level of V = 0.58 tons/ac.
3. S marginal means = 0.34 tons/ac. 7. V means at the same level of S = 0.90 tons/ac.
4. T means at the same level of V = 0.48 tons/ac. S.E. of body of S x T table = 0.34 tons/ac.

Crop: Potato (Rahi).
Site: Central Potato Res. Stn., Patna.
Ref: C.P.R.I. 59(104).
Type: ‘CV’.

Object: To find out the suitable seed size that will give the maximum yield.

1. BASAL CONDITIONS:
(i) (a) Sannhemp-Potato. (b) Sannhemp. (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis. C.P.R.S., Patna. (iii) 4.11.1959. (iv) (a) 3 ploughings and cross ploughings each followed by a planking. (b) Ridge and furrow planting. (c) 2' x 9'. (d) N.A. (v) A/S at 6 md. per ac. and Super at 6 md. per ac. The fertilizers were applied at the time of planting. (vi) As per treatments. (vii) Irrigated. (viii) 3 weeding and 1 earthing. (ix) 8.49'. (x) 1.2.1960.

2. TREATMENTS:
Main-plot treatments:
3 varieties: V₁=ON-2236, V₂=Up-to-date and V₃=Kufri red.

Sub-plot treatments:
7 sizes of seeds: S₁=½, S₂=1, S₃=1½, S₄=2, S₅=3, S₆=4 and S₇=1½ oz.
For S₁ to S₄ seed sown was whole and for S₅ to S₇ cut tuber was used.
3. DESIGN:
(i) Split-plot. (ii) 6 main-plots/replication; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 10.5' x 9'. (v) 1' x 9'. (vi) Yes.

4. GENERAL:
(i) Stand was inferior and growth was satisfactory. (ii) Fungicidal spray against late blight. (iii) Yield of tuber. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullundur and Babaghar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 5.69 tons/acre. (ii) (a) 1.06 tons/acre. (b) 0.91 tons/acre. (iii) Main effect of S is highly significant. V effect and interaction V x S are significant. (iv) Av. yield of tuber in tons/acre.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( S_4 )</th>
<th>( S_5 )</th>
<th>( S_6 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>6.33</td>
<td>6.74</td>
<td>7.74</td>
<td>7.45</td>
<td>4.37</td>
<td>5.57</td>
<td>6.65</td>
</tr>
<tr>
<td>( V_2 )</td>
<td>5.29</td>
<td>4.98</td>
<td>8.55</td>
<td>7.59</td>
<td>3.07</td>
<td>4.50</td>
<td>4.36</td>
</tr>
<tr>
<td>( V_3 )</td>
<td>5.03</td>
<td>5.89</td>
<td>5.58</td>
<td>6.84</td>
<td>4.48</td>
<td>4.66</td>
<td>4.15</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 0.33 tons/acre.
2. S marginal means = 0.43 tons/acre.
3. S means at the same level of V = 0.74 tons/acre.
4. V means at the same level of S = 0.76 tons/acre.

Crop: Potato (Rabi).
Site: Central Potato Res. Sta., Patna.
Type: 'CV'.

Ref: C.P.R.I. 58(114).

Object:—To find out the time rate of tuberization of commercial varieties of Potato.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.P., Patna. (iii) 1.11.1958. (iv) (a) 4 ploughings. (b) Ridge and furrows method. (c) N.A. (d) 10.5' x 9'. (e) N.A. (f) G.M.+A/S at 6 mds./ac. half at the time of planting and half at the time of earthing up and Super at 6 rods./ac. at the time of planting. (vi) As per treatments. (vii) Irrigated. (viii) 1 earthing. (ix) N.A. (x) As per treatments.

2. TREATMENTS:
Main-plot treatments:
6 varieties: \( V_1 = \) Up-to-date, \( V_2 = \) ON-45, \( V_3 = \) ON-1360, \( V_4 = \) ON-2235 (Kufri kahar), \( V_5 = \) Kufri red and \( V_6 = \) Kufri safeda (Phuboa).

Sub-plot treatments:
8 dates of harvest at an interval of 10 days: \( D_1 = 26.12.1958 \) (56 days after planting), \( D_2 = 5.1.1959 \), \( D_3 = 15.1.1959 \), \( D_4 = 25.1.1959 \), \( D_5 = 4.2.1959 \), \( D_6 = 14.2.1959 \), \( D_7 = 24.2.1959 \) and \( D_8 = 6.3.1959 \).

3. DESIGN:
(i) Split-plot. (ii) 6 main-plots/replication; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 10.5' x 12'. (b) 7.5' x 10.5'. (v) 11.5' x 9'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of tuber. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullundur and Babaghar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 5.69 tons/acre. (ii) (a) 5.83 tons/acre. (b) 1.18 tons/acre. (iii) Main effects of V and D are highly significant. (iv) Av. yield of tuber in tons/acre.
Crop: Potato (Rabi).

Ref: C.P.R.I. 59(106).

Site: Central Potato Res. Stn., Patna.

Type: 'CV'.

Object: To find out the time rate of tuberisation of commercial varieties of Potato.

I. BASAL CONDITIONS:
   (i) (a) Sannhemp — Potato. (b) Sannhemp. (c) Nil.
   (ii) (a) Loamy. (b) Refer soil analysis, C.P.R.I., Patna.
   (iii) 10 and 11.11.1959.
   (iv) (a) 3 ploughings and cross ploughings each followed by planking. (b) Ridge and furrow method.
   (v) 24, 22, 22, 18 and 20 mds./ac. according to V1 to V4.
   (vi) A.S. with sannhemp, A/S and Super each at 6 mds./ac. (vii) Irrigated.
   (viii) Weeding and earthing.
   (ix) 6.49'. (x) As per treatments.

2. TREATMENTS:
   Main-plot treatments:
   6 varieties: V1 = Up-to-date, V2 = ON-45, V3 = ON-1460, V4 = Kufri red and V5 = C.D.
   V6 = C.D.

   Sub-plot treatments:

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/replication; 7 sub-plot/main-plot. (b) N.A. (iii) 3. (iv) (a) 13½' x 10½'.
   (b) 10x9'. (v) 14' x 9'. (vi) Yes.

4. GENERAL:
   (c) Stand uniform and growth satisfactory. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1957—1959. (b) No.
   (c) Nil. (v) (a) Jullundur and Babugarh. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 5.80 tons/ac. (ii) (a) 1.73 tons/ac. (b) 0.86 tons/ac. (iii) Main effects of V and D are highly significant.

   Av. yield of potato in tons/ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.10</td>
<td>4.07</td>
<td>5.72</td>
<td>6.29</td>
<td>5.91</td>
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<tr>
<td>5.34</td>
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</tr>
<tr>
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<td>8.80</td>
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</tr>
<tr>
<td>4.81</td>
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</tr>
<tr>
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<td>4.48</td>
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<td>6.27</td>
<td>6.04</td>
<td>9.01</td>
<td>5.80</td>
</tr>
</tbody>
</table>
S.E. of difference of two

1. V marginal means
   = 0.53 tons/ac.
2. D marginal means
   = 0.29 tons/ac.
3. D means at the same level of V
   = 4.70 tons/ac.
4. V means at the same level of D
   = 0.84 tons/ac.

Crop -> Potato (Rabi).
Site -> Central Potato Res. Sta., Patna.

Object:—To secure the information on the rate of bulking of Commercial varieties of Potato.

1. BASAL CONDITIONS:
   (i) (a) Sannhemp—Potato. (b) Sannhemp. (c) N.A. (ii) (a) Loam clayey. (b) Refer soil analysis, C.P.R.S., Patna. (iii) As per treatments. (iv) (a) 3 ploughings+cross ploughings each followed by a planking. (b) Ridge and furrow method. (c) For up-to-date 24 mds./ac. and for Kufri red 18 mds./ac. (d) 14" x 9". (e) N.A. (v) Sannhemp (G.M.) and 8 mds./ac. each of A/S and Super applied at the time of planting. (vi) As per treatments. (vii) Irrigated. (viii) Weeding and 3 earthings. (x) 8.49'.

2. TREATMENTS:
   Main-plot treatments: 2 varieties: V1=Up-to-date and V2=Kufri-red.
   Sub-plot treatments:
   D1 to D4 are cold size seed and D5 to D7 are hill seed.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 7 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 19' x 12'. (b) 16' x 10'. (v) 18' x 9'. (vi) Yes.

4. GENERAL:
   (i) Stand was not uniform and growth was good in early planting plots. (ii) Fungicidal spray as precautionary measure for late blight disease. (iii) Yield of potato. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) Jullunder and Babugarh. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1.99 tons/ac. (ii) 1.14 tons/ac. (b) 0.77 tons/ac. (iii) Main effect of D is highly significant. (iv) Av. yield of potato in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
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<td>4.38</td>
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<tr>
<td>Mean</td>
<td>4.47</td>
<td>4.49</td>
<td>2.73</td>
<td>1.46</td>
<td>0.39</td>
<td>0.31</td>
<td>0.12</td>
<td>1.99</td>
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</tbody>
</table>

S.E. of difference of two

1. V marginal means
   = 0.35 tons/ac.
2. D marginal means
   = 0.44 tons/ac.
3. D means at the same level of V
   = 0.63 tons/ac.
4. V means at the same level of D
   = 0.68 tons/ac.
Crop : Potato (Rabi).  
Site : Central Potato Res. Stn., Babugarh.  
Ref : C.P.R.I. 59[92(a)].  
Type : 'CM'.

Object : To find out the suitable spacing between plants and rows at different levels of N for Potato.

1. BASAL CONDITIONS :
   (i) to (iii) N.A.  (iv) (a) to (c) N.A.  (v) As per treatments.  (vi) N.A.  (vii) Earthing.  (viii) Irrigated.

2. TREATMENTS :
   All combinations of (1), (2) and (3)
   (1) 3 spacings between plants : S1 = 6", S2 = 9" and S3 = 12".
   (2) 3 spacings between rows : R1 = 1', R2 = 1'1" and R3 = 2'.
   (3) 3 levels of N : N0 = 0, N1 = 100 and N2 = 200 lb./ac.

3. DESIGN :
   (i) 3 blocks/replication; 9 plots/block.  (ii) N.A.  (iii) 24' x 12'.  (iv) 24'.  (v) Nil.  (vi) Yes.

4. GENERAL :

5. RESULTS :
   (i) 0.79 tons/ac.  (ii) 1.37 tons/ac.  (iii) None of the effects is significant.  (iv) Av. yield of potato in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
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</table>

S.E. of any marginal mean = 0.79 tons/ac.
S.E. of body of any table = 1.37 tons/ac.

---

Crop : Potato (Rabi).  
Site : Central Potato Res. Stn., Babugarh.  
Ref : C.P.R.I. 59[92(b)].  
Type : 'CM'.

Object : To find out the suitable spacing between plants and rows at different levels of N for Potato.

1. BASAL CONDITIONS :
   (i) to (iii) N.A.  (iv) (a) to (c) N.A.  (v) As per treatments.  (vi) N.A.  (vii) Earthing.  (viii) Irrigated.

2. TREATMENTS :
   Same as in expt. no. 59[92(a)] above.

3. RESULTS :
   (i) 10.02 tons/ac.  (ii) 2.38 tons/ac.  (iii) None of the effects is significant.  (iv) Av. yield of potato in tons/ac.
Crop: Potato.  
Ref: C.P.R.I. 59(44 a).

Site: Potato Exptl. and Trial Centre, Jullundur. Type: 'CM'.

Object: To find out the suitable spacing between plants and rows at different levels of N for Potato.

1. BASAL CONDITIONS:
   (i) (a) and (b) Sown hemp. (c) Nil. (d) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Jullundur. (iii) 21.10.1959, (iv) (a) 1 tractor ploughing, 2 plankings, 2 tilling and 1 discing. (b) By hand. (c) 15 to 20 mds./ac. (d) As per treatments. (e) 1. (iv) Super at 6 mds./ac. was applied in bands below the seed at the time of planting. (vi) Kufri red and up-to-date. (vii) Irrigated. (viii) Crust breaking and weeding 3 times and earthing up once. (ix) 10.25 cms. (x) 18.3, 1960.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as C/A/N: N = 0, N = 100 and N = 200 lb/ac.
   (2) 3 spacings between plants: S1 = 6"., S2 = 9" and S3 = 12".
   (3) 3 spacings between rows: R1 = 1", R2 = 1½ and R3 = 2".
   N applied on 21.10.1959.

3. DESIGN:
   (i) 3 rd conf. (SR2 N2 is completely confd). (ii) (a) 3 blocks/replication; 9 plots/block. (b) 72' x 108'. (iii) (iv) (a) and (b) 24' x 12'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Attack of early blight was severe, late blight and frost were moderate. Spraying of bordeaux mixture and Basudin were given and irrigation interval was reduced when frost was severe. (iii) Tuber yield, (iv) (a) 1959—not contd. (b) No. (c) Nil. (v) (a) Babugarh and Patna. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 4.10 tons/ac. (ii) 0.97 tons/ac. (iii) Main effects of R, N and interaction R × N are highly significant. (iv) Av. yield of potato in tons/ac.

<table>
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<th>R2</th>
<th>R3</th>
<th>Mean</th>
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</table>
Crop: Potato.
Site: Potato Exptl. and Trial Centre, Jullundur. Type: 'CM'.

Object: To find out the suitable spacing between plants and rows at different levels of N for Potato.

1. BASAL CONDITIONS to 4. GENERAL:
Same as in expn. no. 59(44(a)) on page 200.

5. RESULTS:
(i) 3.94 tons/acre.
(ii) 0.77 tons/acre.
(iii) Main effects of N, R and S are highly significant.
(iv) Av. yield of potato in tons/acre.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
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S.E. of any marginal mean = 0.18 tons/acre.
S.E. of body of any table = 0.31 tons/acre.

Crop: Potato (Rabi).
Site: Central Potato Res. Stn., Patna. Type: 'CM'.

Object: To find out the suitable spacings between plants and rows at different levels of N for Potato.

1. BASAL CONDITIONS:
(i) (a) Sanbhemp—Potato. (b) Sanbhemp. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.S., Patna. (iii) 3.11.1959. (iv) (a) 3 ploughings and cross ploughings each followed by planking. (b) Ridges and furrows method. (c) 25 and 16 m/s. for V1 and V2 respectively. (d) As per treatments. (e) N.A. (v) P2O5 as Super applied in hand placement (in rows below seed) just before planting. (vi) V1—Up to date and V2—Kufri Red. (vii) Irrigated. (viii) 1 weeding and earthing. (x) 8.49". (x) 8.2.1960.

2. TREATMENTS:
Same as in expn. no. 59(44(a)) on page 200.

3. DESIGN:
(i) 3 confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) and (b) 24' x 10'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Attack of Cut worm; fungicidal sprays against late blight. (iii) Yield of potato, (iv) (a) 1957-1959. (b) No. (c) Nil. (v) (a) Jullunder and Babupurh. (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 8.75 tons/ac. (ii) 1.91 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of potato in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>Mean</th>
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<th>N₁</th>
<th>N₂</th>
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</tr>
<tr>
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<td>8.75</td>
<td>5.56</td>
<td>10.00</td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.65 tons/ac.
S.E. of body of any table = 1.12 tons/ac.

Crop: Potato.
Site: Central Potato Res. Stn., Patna.
Ref: C.P.R.I. 59[102(b)].
Type: 'CM'.

Object: To find out a suitable spacing between plants and rows at different levels of N for Potato.

1. BASAL CONDITIONS to 4. GENERAL:
Same as in exppt. no. 59[102(a)] on page 201.

5. RESULTS:
(i) 7.04 tons/ac. (ii) 0.99 tons/ac. (iii) Main effect of N is highly significant and interaction R × S is significant. (iv) Av. yield of potato in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>Mean</th>
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<td>7.19</td>
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</tr>
<tr>
<td>N₂</td>
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S E. of any marginal mean = 0.33 tons/ac.
S.E. of body of any table = 0.57 tons/ac.

Crop: Potato.
Site: Potato Exptl. and Trial Centre, Jullundur.
Ref: C.P.R.I. 58(43).
Type: 'IVM'.

Object: To study the effect of N, P and K and different interval of irrigations on different varieties of Potato.
1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Sannhemp. (c) N.A. (iii) Sandy loam. (b) Refer soil analysis, C.P.R.I., Jullundur. (iii) 12, 13.10.1958. (iv) I tractor ploughing, 2 plankings and 1 discing. (b) By hand. (c) 15 to 20 mds/ac. (c) 21°×97°. (c) 1. (c) 250 mds/ac. of P.Y.M. one month before planting. (vi) 3 per treatments. (vii) Irrigated. (viii) Mulching after every irrigation and earthing up twice. (ix) 0.5". (x) 16 to 26.3.1959.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 3 varieties: \( V_1 = \text{ON}, V_2 = \text{Up-to-date} \), and \( V_3 = \text{Kufri} \).
   (2) 3 intervals of irrigation: \( I_1 = 7 \), \( I_2 = 10 \) and \( I_3 = 13 \) days.

Sub-plot treatments:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/SiN: \( N_0 = 0, N_1 = 100 \), and \( N_2 = 200 \) lb/ac.
(2) 3 levels of \( \text{P}_2\text{O}_5 \) at Super: \( P_0 = 0, P_1 = 75 \) and \( P_2 = 150 \) lb/ac.
(3) 3 levels of \( \text{K}_2\text{O} \) as Potash: \( K_0 = 0, K_1 = 100 \) and \( K_2 = 200 \) lb/ac.

3. DESIGN:
   (i) Split-plot confd. (ii) (a) 9 main-picts (replication); 9 blocks/main-plot. (b) N.A. (iii) 1. (iv) (a) 19.5'×19.5'. (b) 16.5'×16.5'. (v) 1.5'×1.5'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Attack of early blight severe, late blight moderate. Frost attack was severe in some plots and moderate in others. Spraying done to control both and ailds. (iii) Tubar yield. (iv) (a) 1958–1959. (b) No. (c) Nil. (v) (a) Babugarh and Patna. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 5.75 tons/ac. (ii) (a) 3.07 tons/ac. (b) 1.12 tons/ac. (iii) Main effects of N, P and interaction N×P are highly significant. (iv) Av. yield of potato in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>( I_1 )</th>
<th>( I_2 )</th>
<th>( I_3 )</th>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
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<td>5.82</td>
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<td>5.75</td>
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</table>

### E. of difference of two
1. 1. or V marginal means = 0.48 tons/ac.
2. N, P or K marginal means = 0.17 tons/ac.
3. N, P or K means at the same level of I or V = 0.30 tons/ac.
4. I or V means at the same level of N, P or K S.E. of body of I×V table = 0.54 tons/ac.
5. E. of body of N×P, N×K or P×K table = 0.59 tons/ac.
6. E. of body of N×P, N×K or P×K table = 0.21 tons/ac.
Crop : Potato.  Site : Potato Exptl. and Trial Centre, Jullundur.  Type : 'IVM'.

Object :—To study the effect of N, P, K and different intervals of irrigation on different varieties of Potato.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Sandhemp. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R. I, Jullundur. (iii) 14.10.1959. (iv) (a) 1 tractor ploughing, 2 plankings, 2 trollings and discing. (b) By hand. (c) 15 to 20 mds./ac. (d) 21’’x9”. (e) 1. (v) 250 mds./ac. of F.Y.M. one month before planting. (vi) As per treatments. (vii) Irrigated. (viii) 3 crust breakings and weeding, earthing up once and spraying against late blight twice. (ix) 0.22”. (x) 16 and 18.2.1960.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 2 varieties: V₁=O.N.—1360, V₂=Up-to-date and V₃=Kufri-red.
   (2) 3 intervals of irrigation: 1₁=6, 1₂=10 and 1₃=14 days.

   Sub-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as C/A/N : N₀=0, N₁=100 and N₂=200 lb./ac.
   (2) 3 levels of P₂O₅ as Super : P₀=0, P₁=75 and P₂=150 lb./ac.
   (3) 3 levels of K₂O as Potash : K₀=0, K₁=100 and K₂=200 lb./ac.

3. DESIGN and 4. GENERAL:
   Same as in exp. no. 58(43) on page 202.

5. RESULTS:
   (i) 7.25 tons/ac. (ii) (a) 2.73 tons/ac. (b) 1.34 tons/ac. (iii) Main effect of V, N, P, K and interaction N×K, N×V and N×I are highly significant. (iv) Av. yield of potato in tons/ac.

<table>
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<th>V₃</th>
<th>I₁</th>
<th>I₂</th>
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S.E. of difference of two
1. I or V marginal means
2. N, P or K marginal means
3. N, P or K means at the same level of I or V
4. I or V means at the same level of N, P or K
S.E. of body of I×V table
S.E. of body of N×P, N×K or P×K table
Crop: Potato (Rabi).
Site: Central Potato Res. Sta., Patna.
Object: To study the effect of manures and irrigation on different varieties of Potato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Patna. (iii) 1 to 3.11.1927. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) 18"x9". (e) N.A. (v) Sahnewal as G.M. (vi) As per treatments. (vii) Irrigated. (viii) 2 earthingo. (ix) N.A. (x) 12 to 14 and 17 to 20.3.1958.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2):
   (1) 3 varieties: V₁ = N-1360, V₂ = Up-to-date and V₃ = Darjeeling red round.
   (2) 3 intervals of irrigation: I₃ = 6, I₂ = 10 and I₁ = 14 days.

   Sub-plot treatments:
   All combinations of (1), (2) and (3):
   (1) 3 levels of N as A/S: N₀ = 0, N₁ = 100 and N₂ = 200 lb./ac.
   (2) 3 levels of P₂O₅ as Super: P₀ = 0, P₁ = 75 and P₂ = 150 lb./ac.
   (3) 3 levels of K₂O as Pot. Sol.: K₀ = 0, K₁ = 50 and K₂ = 100 lb./ac.

   Manuring done from 1 to 3.11.1957.

3. DESIGN:
   (i) Split-plot confd. (ii) (a) 9 main-plots/replication; 3 blocks/main-plot and 9 sub-plots/block. (b) N.A. (iii) 15'x10'. (b) 12'x10.5'. (V) 1.5'x9'. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Tuber yield. (iv) (a) 1957–1959. (b) N.A. (c) Nil. (v) (a) Babugahr and Jullundur. (b) N.A. (vi) and (vii) N.A.

5. RESULTS:
   (i) 6.97 tons/ac. (ii) (a) 3.27 tons/ac. (b) 0.77 tons/ac. (iii) Main effects of N, K, V, I and interactions V×N, V×K, I×N, I×P and I×K are highly significant. Interactions N×P and N×K are significant. (iv) Av. yield of tuber in tons/ac.

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S.E. of difference of two
1. V or I marginal means = 0.51 tons/ac.
2. N, P or K marginal means = 0.12 tons/ac.
3. N, P or K means at the same level of V or I = 0.21 tons/ac.
4. V or I means at the same level of N, P or K = 0.34 tons/ac.
S.E. of body of V×I table = 0.03 tons/ac.
S.E. of body of N×P, P×K or N×K table = 0.15 tons/ac.
Crop: Potato
Site: Central Potato Res. Stn., Patna.

Object: To study the effect of manures and irrigation on different varieties of Potato.

1. BASAL CONDITIONS:
   (i) (a) Sannhemp—Potato, (b) Sannhemp, (c) Nil. (ii) (a) Sandy loam, (b) Refer soil analysis, C.P.R.I, Patna. (iii) 16 to 19.11.1959. (iv) (a) 3 ploughings and planskings. (b) Ridge and furrow method. (c) 24 mds./ac. for V1 and V2 and 18 mds./ac. for V3. (d) 18"x9". (e) 1. (v) Sannhemp as G.M. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding and 1 earthing. (ix) 8.49". (x) 22 to 24, 26, 29.2.1960 and 2 and 3.3.1960.

2. TREATMENTS:
   Same as in expt. no. 58(43) on page 202.

3. DESIGN:
   (i) Split-plot confd. (ii) (a) 9 main-plots/repl. 3 blocks/main-plot and 9 sub-plots/block. (b) N.A. (iii) 1. (iv) (a) 13.5'x12'. (b) 10.5'x10.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Fungicidal spray against late blight. (iii) Tubor yield. (iv) (a) 1957—1959. (b) N.A. (c) Nil. (v) (a) Babugarh and Jullundur, (b) Nil. (vii) N.A. and (viii) N.A.

5. RESULTS:
   (i) 4.79 tons/ac. (ii) (a) 4.50 tons/ac. (b) 0.92 tons/ac. (iii) Main effect of N is highly significant and interaction I x N is significant. (iv) Avg. yield of tuber in tons/ac.

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S.E. of difference of two
1. V or I marginal means = 0.70 tons/ac.
2. N0, P or K marginal means = 0.14 tons/ac.
3. N0, P or K means at the same level of V or I = 0.25 tons/ac.
4. V or I means at the same level of N0, P or K = 0.73 tons/ac.
S.E. of body of V x I table = 0.87 tons/ac.
S.E. of body of N x P, P x K or N x K table = 0.18 tons/ac.
Object: To find out the requirements of N, P and K fertilizers for Potato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, C.P.R.I., Patna. (iii) 10, 12, 13, 14 and 18.11.1958. (iv) (a) 4 ploughings. (b) and (c) N.A (d) 14' x 9'. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Earthing up on 11, 13 and 16.12.1958. (ix) N.A. (x) 13 to 23.2.1959.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 3 varieties: V1 = 0.N.-2236, V2 = Up-to-date and V3 = Ku/ri-red.
   (2) 2 irrigation levels: I1 = 7, I2 = 10 and I3 = 13 days.

   Sub-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A/S: N0 = 0, N1 = 100 and N2 = 200 lb/ac.
   (2) 3 levels of P2O5 as Super: P0 = 0, P1 = 75 and P2 = 150 lb/ac.
   (3) 3 levels of K2O as Pot. Sol.: K0 = 0, K1 = 50 and K2 = 100 lb/ac.

3. DESIGN:
   (i) 32 x 32 Split-plot confd. (ii) (a) 9 main-plots/replication; 27 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 5' x 12'. (b) 12' x 10'. (v) 14' x 9'. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Tuber yield. (iv) (a) 1957—1959. (b) N.A. (c) Nil. (v) (a) Babugarh and Jullundur. (b) N.A. (vi) and (vii) N.A.

5. RESULTS:
   (i) 5.82 tons/ac. (ii) (a) 2.36 tons/ac. (b) 2.58 tons/ac. (iii) Only main effect of N is highly significant.
   (iv) Av. yield of tuber in tons/ac.

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S.E. of difference of two
1. V or I marginal means = 0.37 tons/ac.
2. N, P or K marginal means = 0.40 tons/ac.
3. N, P or K means at the same level of V or I = 0.70 tons/ac.
4. V or I means at the same level of N, P or K = 0.68 tons/ac.
S.E. of body of V x I table = 0.45 tons/ac.
S.E. of body of N x P, N x K or P x K table = 0.50 tons/ac.
JUTE AGRICULTURAL RESEARCH INSTITUTE, NILGANJ, BARRACKPORE.

1. Name of experimental station : Jute Agricultural Research Institute.
2. Tehsil or Taluka : Barrackpore.
4. Address : Director, Jute Agricultural Research Institute, Nilganj, Barrackpore, West Bengal.
6. Latitude 22° 45' N
   Longitude 88° 26' E
   Altitude 30'
7. Whether research, multiplication or demonstration farm : Research farm.
8. Whether State, University or private managed : Under the administration of I.C.A.R.
9. Programme of research : Breeding and Genetics, Cytogenetics, Anatomy, Plant Nutrition and Plant Physiology, Agronomy, Agricultural Chemistry and Microbiology, Mycology and Plant Pathology and Entomology of jute, mesta and allied long fibres and improvement of existing agricultural implements under Agricultural Engineering Section.
11. Type of tract it represents : Alluvial.
12. General description of the topography of the experimental area : More or less plain.
13. Soils :
   (a) Broad soil types :
      (i) Depth :
      (ii) Colour :
      (iii) Structure :
   (b) Chemical analysis :
      Organic carbon (W. B. value) 0.5 to 0.7%
      Total nitrogen 0.05 to 0.07%
      Available CaO 0.3 to 0.5%
      Available FeO 60 to 100 p.p.m.
      Available K2O 0.04 to 0.07%
      pH 6.7 to 7.2
(c) Mechanical analysis:

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14. Normal average rainfall in mm.:

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<td>251.7</td>
<td>317.4</td>
<td>246.8</td>
<td>307.7</td>
<td>126.7</td>
<td>7.0</td>
<td>0.1</td>
<td>14.2</td>
<td>17.7</td>
<td>22.8</td>
<td>33.8</td>
<td>90.2</td>
<td>1436.1</td>
<td></td>
</tr>
</tbody>
</table>

(The period on which the figures are based is 1956-1965.)

15. Irrigation facilities available;

<table>
<thead>
<tr>
<th>Year from which the facilities were made available</th>
<th>Irrigation of about 8 acres is being done by portable pumps from the adjoining canal and ponds since 1952. 35 acres are being irrigated by a deep tubewell since 1963. 58 acres are without irrigation facilities.</th>
</tr>
</thead>
</table>

16. Whether any proper drainage system exists:

Yes.
CENTRAL NUCLEUS JUTE SEED MULTIPLICATION FARM, BUDBUD (PANAGARH)

1. Name of the experimental station : Central Nucleus Jute Seed Multiplication Farm.
2. Tehsil or Taluka : Galsi.
4. Address : Central Nucleus Jute Seed Multiplication Farm, P.O. Budbud, District Burdwan, W.B.
6. Latitude N.A.
   Longitude N.A.
7. Whether research, multiplication or demonstration farm : Seed multiplication farm.
8. Whether State, University or private managed : Regional office (Jute Development), Govt of India, Ministry of Food and Agriculture.
9. Programme of research : Besides seed production, some trials on jute are undertaken.
10. Normal cropping pattern : Jute—Paddy; Jute—Wheat or Gram.
11. Type of tract it represents : Old alluvial (sandy clay).
12. General description of the topography of the experimental area : The land is medium high, level and slightly sloping.
13. Soils :
   (a) Broad soil types :
   (i) Depth : Laterite from heavy clay to loam clay.
   (ii) Colour : N.A.
   (iii) Structure : Grey.
   (b) Chemical analysis :
   Total nitrogen 0.057% to 0.07%
   Organic carbon 0.4% to 0.5%
   pH 6.1 to 6.3
   Exchangeable calcium 7 to 14 m.e.%
   Available P2O5 2 to 4 ppm
   Available aluminium 400 to 600 ppm
   Available iron 1500 to 2400 ppm
   Available manganese 40 to 80 ppm
   (c) Mechanical analysis : N.A.
14. Normal average rainfall in cm. :

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rain</td>
<td>19</td>
<td>33</td>
<td>21</td>
<td>21</td>
<td>9</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>121</td>
<td></td>
</tr>
</tbody>
</table>

(The average rainfall is based on the period June, 1963 to May 1967).
15. **Irrigation facilities available:**
   Year from which the facilities were made available:

3 pump sets of 5 H.P. for small irrigation purposes from the tanks since 1961. One tube was bored in 1962 and irrigation facilities will be available after the work of laying pipe lines is completed.

16. **Whether any proper drainage system exists:**

The existing drainage system has been choked by the squatters by building hutsments over the drain.
Crop :- Paddy.
Object:—To study the effect of manures and G.M. on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 31.7.1954. (iv) (a) Ploughing and laddering. (b) Transplanting. (c) and (d) N.A. (e) 2 to 3. (v) and (vi) N.A. (vii) Unirrigated. (viii) 2 weedings and interculture. (ix) 48.89°. (x) 4.12.1954.

2. TREATMENTS:
10 manurial treatments : M₀ = Control (no manure). M₁ = Cowpea as G.M. M₂ = Dhaincha as G.M., M₃ = Oil cake. M₄ = F.Y.M., M₅ = Compost. M₆ = Sludge. M₇ = 20 lb./ac. of N+60 lb./ac. of P₂O₅+25 lb./ac. of K₂O. M₈ = Cowpea (G.M.)+20 lb./ac. of lime and M₉ = Dhaincha as G.M.+200 lb./ac. of lime.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) 98'×64'. (iii) 4. (iv) (a) 30'×13'. (b) 28'×15'. (v) 1'×1'. (vi) Ye.²

4. GENERAL:
(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2263 lb./ac. (ii) 355.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1510</td>
<td>2846</td>
<td>2564</td>
<td>2204</td>
<td>2340</td>
<td>2392</td>
<td>2133</td>
<td>1977</td>
<td>2334</td>
<td>2317</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>177.9 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: - Paddy (Aman).

Object: - To study the effect of manures and G.M. on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 24.8.1956. (iv) (a) Ploughing and laddering. (b) Transplanting. (c) and (d) N.A. (e) 2 to 3. (v) and (vi) N.A. (vii) Unirrigated. (viii) Weeding and thinning. (ix) 69.29°. (x) 18.12.1956.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 54(18) on page 209.

5. RESULTS:
(i) 2487 lb./ac. (ii) 230.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₈</th>
<th>M₇</th>
<th>M₆</th>
<th>M₅</th>
<th>M₄</th>
<th>M₃</th>
<th>M₂</th>
<th>M₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2155</td>
<td>2577</td>
<td>2671</td>
<td>2697</td>
<td>2411</td>
<td>2463</td>
<td>2334</td>
<td>2593</td>
</tr>
</tbody>
</table>

S.E./mean = 115.1 lb./ac.

Crop: - Paddy (Aman).

Object: - To study the effect of G.M. and manures on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 6.9.1958. (iv) (a) Ploughing and laddering. (b) Transplanted. (c) and (d) N.A. (e) 2 to 3. (v) and (vi) N.A. (vii) Unirrigated. (viii) Weeding and thinning. (ix) 45.26°. (x) 1st week of December, 1958.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 54(18) on page 209.

5. RESULTS:
(i) 2069 lb./ac. (ii) 208.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₈</th>
<th>M₇</th>
<th>M₆</th>
<th>M₅</th>
<th>M₄</th>
<th>M₃</th>
<th>M₂</th>
<th>M₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1919</td>
<td>2126</td>
<td>2139</td>
<td>2204</td>
<td>1945</td>
<td>2152</td>
<td>1997</td>
<td>2191</td>
</tr>
</tbody>
</table>

S.E./mean = 154.0 lb./ac.

Crop: - Paddy (Aman).

Object: - To study the optimum time of sowing and age of G.M. crops for incorporation when sown pure or inter-cropped with jute on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 31.8.1954. (iv) (a) 4 to 5 ploughings and spacing. (b) N.A. (c) N.A. (d) 1' between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 2 weedings and 2 thinnings. (ix) 48.89°. (x) 10.12.1954.
2. TREATMENTS:

14 manurial treatments: 
- T₁ = Cowpea sown alone and incorporated after 55 days, 
- T₂ = Dhaincha sown alone and incorporated after 55 days, 
- T₃ = Cowpea intercropped with jute and incorporated after 56 days, 
- T₄ = Dhaincha intercropped with jute and incorporated after 56 days, 
- T₅ = Cowpea sown alone and incorporated after 35 days, 
- T₆ = Dhaincha sown alone and incorporated after 35 days, 
- T₇ = Cowpea intercropped with jute and incorporated along with jute-tops after 35 days, 
- T₈ = Dhaincha intercropped with jute and incorporated along with jute-tops after 35 days, 
- T₉ = Cowpea sown alone and incorporated after 56 days, 
- T₁₀ = Dhaincha sown alone and incorporated after 56 days, 
- T₁₁ = Cowpea intercropped with jute and incorporated along with jute-tops after 35 days, 
- T₁₂ = Dhaincha intercropped with jute and incorporated along with jute-tops after 35 days, 
- T₁₃ = Fallow—Paddy, and 
- T₁₄ = Jute—Paddy.

3. DESIGN:

(i) R.B.D. (ii) 14 (b) 145' x 62'. (iii) 4 (iv) (a) 30' x 19'. (b) 28' x 17'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1934—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1675 lb./ac. (ii) 284.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2196</td>
<td>2088</td>
<td>1327</td>
<td>1457</td>
<td>1687</td>
<td>1730</td>
<td>1909</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₈</th>
<th>T₉</th>
<th>T₁₀</th>
<th>T₁₁</th>
<th>T₁₂</th>
<th>T₁₃</th>
<th>T₁₄</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1980</td>
<td>1420</td>
<td>1552</td>
<td>1580</td>
<td>1915</td>
<td>1418</td>
<td>1162</td>
</tr>
</tbody>
</table>

S.E./mean = 142.3 lb./ac.

---

Crop: Paddy (Aman).
Type: 'M'.

Object: To study the optimum time of sowing and age of G.M. crops for incorporation when sown pure or intercropped with jute on the yield of Paddy.
Crop: *Paddy* (Aman).


Object: To study the optimum time of sowing and age of G.M. crops for incorporation when sown pure or intercropped with jute on the yield of *Paddy*.

1. **BASAL CONDITIONS**:

(i) (a) to (c) N.A. (b) Sandy loam. (c) Refer soil analysis, Nilganj. (iii) 23.8.1956. (iv) (a) 4 ploughings and laddering. (b) Broadly in rows. (c) N.A. (d) 1' between rows. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 2 weedings and thinning. (ix) 69.29'. (x) 20.12.1956.

2. **TREATMENTS** to 4. **GENERAL**:

Same as in exp. no. 54(16) on page 210. Kali-kali used in place of cowpea.

3. **RESULTS**:

(i) 2888 lb./ac. (ii) 202.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>3091</td>
<td>3000</td>
<td>2887</td>
<td>2750</td>
<td>3023</td>
<td>2909</td>
<td>3137</td>
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<table>
<thead>
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<th>Treatment</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
<th>T12</th>
<th>T13</th>
<th>T14</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>3114</td>
<td>2637</td>
<td>2932</td>
<td>2978</td>
<td>2819</td>
<td>2500</td>
<td>2659</td>
</tr>
</tbody>
</table>

S.E./mean = 101.4 lb./ac.

---

Crop: *Paddy* (Aman).


Object: To study the comparative efficiency of G.M. alone or in conjunction with fertilizers, when sown pure or incorporated with jute on the yield of *Paddy*.

1. **BASAL CONDITIONS**:

(i) (a) to (c) N.A. (b) Sandy loam. (c) Refer soil analysis, Nilganj. (iii) 15.8.1954. (iv) (a) 3 to 4 ploughings and laddering. (b) Transplanting. (c) 8 srs./ac. (d) N.A. (e) 2 to 3. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 2 weedings and thinning. (ix) 48.89'. (x) 4.12.1954.

2. **TREATMENTS**:

10 manurial treatments: M1 = Control (no manure), M2 = Fertilizers applied to *dhaincha* used as G.M., M3 = *dhaincha* alone, M4 = Fertilizers applied to cowpea used as G.M., M5 = Cowpea alone, M6 = Fallow fertilizers applied to paddy crop, M7 = Non-ditch portion of jute incorporated and M8 = Fibre portion of jute incorporated with fertilizers.

Fertilizers = 20 lb./ac. of N + 60 lb./ac. of P2O5 + 25 lb./ac. of K2O.

3. **DESIGN**:

(i) R.B.D. (ii) 10. (b) N.A. (iii) 4. (iv) (a) 40' x 18'. (b) 37' x 15'. (v) 1.5' x 1.5'. (vi) Yes.

4. **GENERAL**:

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS**:

(i) 2442 lb./ac. (ii) 136.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2215</td>
<td>2648</td>
<td>2776</td>
<td>2713</td>
<td>2590</td>
<td>2705</td>
<td>2561</td>
<td>2879</td>
<td>2500</td>
<td>2638</td>
</tr>
</tbody>
</table>

S.E./mean = 68.1 lb./ac.
Object: To study the comparative efficiency of G.M. alone and in conjunction with fertilizers, when sown pure or incorporated with jute, on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) Middle August, 1956. (iv) (a) 3 to 4 ploughings and laddering. (b) Transplanting. (c) 8 to 9 yrs./ac. (d) N.A. (e) 2. (v) and (vi) N.A. (vii) Unirrigated. (viii) 2 weedings and 2 thinnings. (ix) 49.39°. (x) Middle of March, 1955.

2. TREATMENTS:
Same as in exp. no. 54(15) on page 212.

5. RESULTS:
(i) 1825 lb./ac. (ii) 245.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>1471</td>
<td>1913</td>
<td>2086</td>
<td>1711</td>
<td>2211</td>
<td>1933</td>
<td>1663</td>
<td>2221</td>
<td>1490</td>
</tr>
</tbody>
</table>
| S.E./mean  | 122.7 lb./ac.


Object: To study the optimum time of sowing and age of G.M. crop for incorporation, when or intercropped with jute, on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 31.10.1955. (iv) (a) 2 ploughings and 2 laddering. (b) Broadcast. (c) (a) N.A. (d) and (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (vii) U. (viii) 2 weedings and 2 thinnings. (ix) 48.89°. (x) Middle of March, 1955.
2. TREATMENTS:
14 manural treatments: $T_1$=Kali-kali sown alone and incorporated after 55 days, $T_2$=Sannhemp sown alone and incorporated after 55 days, $T_3$=Kali-kali intercropped with jute and incorporated after 55 days, $T_4$=Sannhemp sown alone and incorporated after 55 days, $T_5$=Kali-kali sown alone and incorporated after 55 days, $T_6$=Sannhemp sown alone and incorporated after 55 days, $T_7$=Kali-kali intercropped with jute and incorporated after 55 days, $T_8$=Sannhemp sown alone and incorporated after 55 days.

3. DESIGN:
(i) R.B.D. (ii) 14. (b) 45'x15'. (c) 1'x1'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 1786 lb./ac. (ii) 333.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2084</td>
<td>1721</td>
<td>1675</td>
<td>1456</td>
<td>1680</td>
<td>1592</td>
<td>1592</td>
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<table>
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<th>$T_8$</th>
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<th>$T_{11}$</th>
<th>$T_{12}$</th>
<th>$T_{13}$</th>
<th>$T_{14}$</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>1659</td>
<td>1760</td>
<td>1453</td>
<td>1739</td>
<td>1488</td>
<td>856</td>
<td>1544</td>
</tr>
</tbody>
</table>

S.E./mean = 150.4 lb./ac.

---

Crop: Wheat (Rabi).
Ref: J.A.R.I. 56(15).
Type: 'M'.

Object: To study the optimum time of sowing and age of G.M. crop for incorporation, when sown pure or incorporated with jute, on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (i) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 10.11.1956. (iv) (a) 4 to 5 ploughings and spading. (b) Broadcast. (c) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 2 weedings and thinning. (ix) 69.29°. (x) 20.3.1957.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 54(17) on page 213.

3. RESULTS:
(i) 139 lb./ac. (ii) 41.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
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<tbody>
<tr>
<td>96</td>
<td>151</td>
<td>118</td>
<td>171</td>
<td>155</td>
<td>165</td>
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<table>
<thead>
<tr>
<th>Treatment</th>
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<th>$T_9$</th>
<th>$T_{10}$</th>
<th>$T_{11}$</th>
<th>$T_{12}$</th>
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<tbody>
<tr>
<td>118</td>
<td>168</td>
<td>155</td>
<td>176</td>
<td>170</td>
<td>73</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 20.7 lb./ac.
Crop :- Wheat (Rabi).

Objective: To study the optimum time of sowing and age of G.M. crop for incorporation, when sow pure or incorporated with jute, on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 1st week of October, 1957.
   (iv) (a) 4 ploughings and spading. (b) Broadcast. (c) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 54(1) on page 213.

3. RESULTS:
   (i) 729 lb. /ac. (ii) 770.6 lb./ac. (iii) Treatments are highly significant. (iv) Av. yield of gram in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>604</td>
<td>662</td>
<td>818</td>
<td>877</td>
<td>740</td>
<td>818</td>
<td>584</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
<th>T12</th>
<th>T13</th>
<th>T14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>506</td>
<td>993</td>
<td>779</td>
<td>818</td>
<td>779</td>
<td>487</td>
<td>721</td>
</tr>
</tbody>
</table>

S.E./mean = 85.3 lb./ac.

Crop :- Rozelle (Kharif).

Objective: To study the effect of manures on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Rozelle. (c) Nil. (d) Sandy loam. (b) Refer soil analysis, Nilganj. (ii) 2.6.1954.
   (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) 20 lb./ac. (d) 4" between plans. (e) 1.
   (x) 10.12.1954.

2. TREATMENTS:
   All combinations of (1), (2) and (3) + 2 extra treatments
   (1) 3 levels of N as A/S: N0 = 0, N1 = 20 and N2 = 40 lb./ac.
   (2) 2 levels of P2O5 as Super: P0 = 0 and P1 = 20 lb./ac.
   (3) 2 levels of K2O as Mur. Fos.: K0 = 0 and K1 = 20 lb./ac.
   Extra treatments: C1 = 20 and C2 = 40 lb./ac. a/o N as compost.
   N applied in two equal doses, one 11 and 1 1/2 months after sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 14. (b) 15°×137°. (iii) 4. (iv) (a) 17°×26°. (b) 15°×24°. (v) 1°×1°. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Weight of green and dry fibre, stand count, base diameter and plant height. (iv) (a)
   1954—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1997 lb./ac. (ii) 154.5 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of dry fibre in lb./ac.
Crop: Rozelle (K harif).

Ref: J.A.R.I. 56(1).
Type: 'M'.

Object: To find out the effect of different manures on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 29.5.1956. (iv) (a) 4 to 6 ploughings and laddering. (b) Broadcast. (c) 15 lb./ac. (d) 4" between plants. (e) (i) (vi) Nil. (vi) R.T.—2 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) N.A. (x) 5.12.1956.

2. TREATMENTS:
All combinations of (1), (2) and (3) + 3 extra treatments
(1) 3 levels of N as A/S: N₀ = 0, N₁ = 60 and N₂ = 120 lb./ac.
(2) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 40 lb./ac.
(3) 2 levels of K₂O as Pot. Chloride: K₀ = 0 and K₁ = 25 lb./ac.
Extra treatments: T₁ = 40 lb./ac. of N as compost, T₂ = 80 lb./ac. of N as compost and T₃ = 120 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 15. (b) 69' x 122'. (iii) 4. (iv) (a) 21' x 22'. (b) 19' x 20'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) Nil. (iii) Weight of green and dry fibre, stand count, base diameter and plant height. (iv) (a) 1956—cond. (expt. not conducted in 1957). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1485 lb./ac. (ii) 210.6 lb./ac. (iii) Main effect of N and effect of T are highly significant. (iv) Av. yield of dry fibre in lb./ac.

\[ T₁ = 1304 \text{ lb./ac.}, \quad T₂ = 1504 \text{ lb./ac.} \text{ and } T₃ = 1948 \text{ lb./ac.} \]

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>1208</td>
<td>1538</td>
<td>1544</td>
<td>1430</td>
<td>1487</td>
<td>1373</td>
</tr>
<tr>
<td>P₁</td>
<td>1232</td>
<td>1500</td>
<td>1737</td>
<td>1490</td>
<td>1543</td>
<td>1437</td>
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<td>Mean</td>
<td>1220</td>
<td>1519</td>
<td>1641</td>
<td>1460</td>
<td>1515</td>
<td>1405</td>
</tr>
<tr>
<td>K₀</td>
<td>1313</td>
<td>1577</td>
<td>1655</td>
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<td></td>
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<tr>
<td>K₁</td>
<td>1127</td>
<td>1461</td>
<td>1627</td>
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<td></td>
</tr>
</tbody>
</table>
Crop: Rozelle (Kharij).

Object:—To find out the effect of different manures on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rozelle. (c) 3 tons/acre of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.
(iii) 3.6.1958. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) 15 lb./acre. (d) 4' between plants. (e) 1. (f) Nil. (v) R.T.—2 (medium). (vi) Unirrigated. (vii) 2 weedings and 1 thinning. (viii) 33.71°.
(ix) 29.11.1958.

2. TREATMENTS to 4.
GENERAL:
Same as in expt. no. 56(1) on page 216.

5. RESULTS:
(i) 1659 lb./acre. (ii) 196.6 lb./acre. (iii) None of the effects is significant. (iv) Av. yield of dry fibre in lb./acre.

\[
\begin{array}{cccccc}
 & N_0 & N_1 & N_2 & \text{Mean} & K_0 \\
 P_0 & 1541 & 1675 & 1730 & 1649 & 1659 \\
P_2 & 1605 & 1695 & 1615 & 1669 & 1672 & 1666 \\
\text{Mean} & 1618 & 1685 & 1673 & 1659 & 1666 & 1652 \\
K_0 & 1653 & 1649 & 1696 & & \\
K_2 & 1383 & 1723 & 1650 & & \\
\end{array}
\]

S.E. of N marginal mean = 49.2 lb./acre.
S.E. of P or K marginal mean = 49.1 lb./acre.
S.E. of body of N x P or N x K table = 69.5 lb./acre.
S.E. of body of P x K table = 56.8 lb./acre.
S.E. of T mean = 98.3 lb./acre.

---

Crop: Rozelle (Kharij).

Object:—To find out the effect of different manures on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rozelle. (c) 3 tons/acre of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.
(iii) 15.6.1959. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) 15 lb./acre. (d) 4' between plants. (e) 1. (f) Nil. (v) R.T.—2 (medium). (vi) Unirrigated. (vii) 2 weedings and 1 thinning. (viii) 84.72°.
2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 56(1) on page 216.

5. RESULTS:
(i) 958 lb./ac. (ii) 169.6 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of dry fibre in lb./ac.

\[ T_1 = 907 \text{ lb./ac.}, T_2 = 962 \text{ lb./ac.} \text{ and } T_3 = 1049 \text{ lb./ac.} \]

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>818</td>
<td>954</td>
<td>1019</td>
<td>944</td>
<td>941</td>
<td>947</td>
</tr>
<tr>
<td>P₁</td>
<td>791</td>
<td>1004</td>
<td>1102</td>
<td>966</td>
<td>1001</td>
<td>931</td>
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<tr>
<td>Mean</td>
<td>805</td>
<td>979</td>
<td>1081</td>
<td>955</td>
<td>971</td>
<td>939</td>
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<td>K₀</td>
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<td>950</td>
<td>1174</td>
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<td>K₁</td>
<td>820</td>
<td>1008</td>
<td>988</td>
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</tr>
</tbody>
</table>

S.E. of N marginal mean = 42.4 lb./ac.
S.E. of P or K marginal mean = 74.6 lb./ac.
S.E. of body of N×P or N×K table = 60.0 lb./ac.
S.E. of body of P×K table = 49.0 lb./ac.
S.E. of T mean = 84.8 lb./ac.

Crop: Rozelle (Kharif).
Ref: J.A.R.I. 54(2).
Type: 'M'.

Object:—To study the effect of different dates of sowing on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rozelle. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) As per treatments. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) 20 lb./ac. (d) 4' between plants. (e) 3 tons/ac. of compost. (vi) H. Sabdariffa. (vii) Irrigated. (viii) 2 weedings and 1 thinning. (ix) 43.68". (x) 3.12, 1954.

2. TREATMENTS:

3. DESIGN:
(i) R.B.D. (ii) (a) 14. (b) 75'×30'. (iii) 4. (iv) (a) 14'×9'. (b) 12'×7'. (c) 1'×1'. (v) Yes.

4. GENERAL:
(i) Fair. (ii) Pests. Pesticide spray was given. (iii) Weight of green and dry fibre, stand count, plant height and base diameter. (iv) 1951—1957. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Last 4 dates were rejected from the analysis as they gave extremely poor yield.

5. RESULTS:
(i) 1796 lb./ac. (ii) 373.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb./ac.

\[
\begin{align*}
\text{Treatment} & \quad D_1 & D_2 & D_3 & D_4 & D_5 & D_6 & D_7 & D_8 & D_9 & D_{10} \\
\text{Av. yield} & 1914 & 2665 & 2408 & 2340 & 2331 & 2042 & 1608 & 1244 & 793 & 515 \\
\text{S.E./mean} & 187.7 \text{ lb./ac.} \\
\end{align*}
\]
Crop: Rozelle (Kharif).
Object: To see the effect of different dates of sowing on the yield of Rozelle.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) As per treatments. (iv) (a) 4 to 6 ploughings and laddering. (b) Broadcast. (c) 25 lb/ac. (d) 4' between rows. (e) 1. (v) 3 tons/ac. of T.C. (vi) M.T.—129 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) 61.75". (x) 6.10.1955.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) 54'x32'. (iii) 4. (iv) (a) 15'x11'. (b) 13'x10'. (v) 1'x1'. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Slight attack of virus. (iii) Weight of green and dry fibre, plant height, base diameter and stand count. (iv) (a) 1951—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 607 lb/ac. (ii) 178.9 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
<th>D8</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>514</td>
<td>536</td>
<td>1060</td>
<td>966</td>
<td>953</td>
<td>559</td>
<td>156</td>
<td>72</td>
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<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>89.4</td>
<td></td>
</tr>
</tbody>
</table>

Crop: Rozelle (Kharif).
Object: To study the effect of different dates of sowing on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) As per treatments. (iv) (a) 4 to 6 ploughings and laddering. (b) Broadcast. (c) 25 lb/ac. (d) 4' between plants. (e) 1. (v) 3 tons/ac. of compost. (vi) M.T.—129 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) and (x) N.A.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) 54'x32'. (i) 4. (iv) (a) 15'x12'. (b) 13'x10'. (v) 1'x1'. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Attack of spiral borer, black pumpkin beetle. DDT sprayed. (iii) Weight of green and dry fibre, base diameter, stand count and plant height. (iv) (a) 1951—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 611 lb/ac. (ii) 80.8 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
<th>D8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>837</td>
<td>1164</td>
<td>1249</td>
<td>814</td>
<td>292</td>
<td>217</td>
<td>216</td>
<td>98</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40.4</td>
<td></td>
</tr>
</tbody>
</table>
Crop: Rozelle (Kharif).


Object: To study the effect of different dates of sowing on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) As per treatments. (iv) (a) 4 to 6 ploughings and laddering. (b) Broadcast. (c) 25 lb/ac. (d) 4" between plants. (e) 1. (v) 3 tons/ac. of compost. (vi) M.T. = 129 (medium). (vii) Unirrigated. (viii) 2 weedings, 1 thinning and mulching. (ix) N.A. (x) 16.9.1957 for D_1 and D_2, 12.10.1957 for D_3 and D_4 and 18.10.1957 for D_5 to D_8.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) 54' x 32'. (iii) 4. (iv) (a) 16' x 13'. (b) 14' x 11'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
   (i) Wilting is found due to draught. (ii) Nil. (iii) Green and dry fibre weight, plant height, base diameter and stand count. (iv) (a) 1951-1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 724 lb/ac. (ii) 265.7 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D_1</th>
<th>D_2</th>
<th>D_3</th>
<th>D_4</th>
<th>D_5</th>
<th>D_6</th>
<th>D_7</th>
<th>D_8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>928</td>
<td>974</td>
<td>1051</td>
<td>823</td>
<td>822</td>
<td>647</td>
<td>339</td>
<td>193</td>
</tr>
<tr>
<td>S.E.(mean)</td>
<td>132.9 lb/ac.</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Crop : Rozelle (Kharif).

Object : To study the effect of different dates of sowing on the yield of Rozelle fibre.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.
   (iii) As per treatments. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) 20 lb./ac. (d) 4' between plants. (e) 1. (v) 3 tons/ac. of compost. (vi) R.T.—1 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) N.A. (x) 26.11.1956.

2. TREATMENTS and 3. DESIGN :
   Same as in expt. no. 56(4) on page 220.

4. GENERAL :
   (i) Fair. (ii) Attack of stemrot in D1, D2 and D3 plots. Perenox and DDT sprayed. (iii) Green and dry fibre weight, plant height, base diameter and stand count. (iv) (a) 1950—1957. (b) No. (c) Nil. (v) to (vi) Nil.

5. RESULTS :
   (i) 1293 lb./ac. (ii) 278.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb./ac.
   Treatment
   \[ \begin{array}{cccccc}
   & D_1 & D_2 & D_3 & D_4 & D_5 \\
   \text{Av. yield} & 2351 & 2199 & 2139 & 1555 & 746 & 628 & 420 & 276 \\
   \end{array} \]
   S.E./mean = 139.3 lb./ac.

---

Crop : Rozelle (Kharif).

Object : To study the effect of different dates of sowing on the yield of Rozelle fibre.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.
   (iii) As per treatments. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) 20 lb./ac. (d) 4' between plants. (e) 1. (v) 3 tons/ac. of compost. (vi) R.T.—1 (medium). (vii) Unirrigated. (viii) 2 weedings, 1 thinning and mulching. (ix) N.A. (x) 18.11.1957.

2. TREATMENTS to 4. GENERAL :
   Same as in expt. no. 57(4) on page 220.

5. RESULTS :
   (i) 1515 lb./ac. (ii) 538.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb./ac.
   Treatment
   \[ \begin{array}{cccccc}
   & D_1 & D_2 & D_3 & D_4 & D_5 \\
   \text{Av. yield} & 2107 & 2086 & 1918 & 1788 & 1761 & 1244 & 644 & 570 \\
   \end{array} \]
   S.E./mean = 251.5 lb./ac.

---

Crop : Rozelle (Kharif).

Object : To study the effect of seedrates on the yield of Rozelle fibre.
1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Rozelle. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 7.5.1954.
   (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) As per treatments. (d) and (e) N.A. (v)
   3 tons/ac. of compost. (vi) H. Cardaminus (medium). (vii) Irrigated. (viii) 2 weedings. (ix) 43.68°.
   (x) 11.9.1954.

2. TREATMENTS:
   8 seed rates: R_1 = 5, R_3 = 10, R_3 = 15, R_1 = 20, R_5 = 25, R_7 = 35 and R_8 = 40 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) 80' x 14'. (iii) 5. (iv) (a) 14' x 10'. (b) 12' x 8'. (v) 4' x 1'. (vi) Yes.

4. GENERAL:
   (i) Pair. (ii) Nil. (iii) Green and dry fibre weight, stand count, base diameter and plant height. (iv) (a)
   1952—1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1127 lb./ac. (ii) 157.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry
   fibre in lb./ac.
   Treatment | R_1 | R_2 | R_3 | R_4 | R_5 | R_6 | R_7 | R_8
   Av. yield   | 947 | 1137| 1223| 1327| 1274| 1118| 1104| 885
   S.E./mean   = 70.6 lb./ac.

   Crop: Rozelle (Kharif).
   Ref: J.A.R.I. 55(6).
   Type: 'C'.

Object: To study the effect of seed rate on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.
   (iii) 3.6.1955. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) As per treatments. (d) and (e)
   N.A. (v) 3 tons/ac. of compost. (vi) MF:—129 (medium). (vii) Unirrigated. (viii) 2 weedings. (ix)
   61.79°. (x) 22.9.1955.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 54(6) on page 221.

5. RESULTS:
   (i) 736 lb./ac. (ii) 109.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre
   in lb./ac.
   Treatment | R_1 | R_2 | R_3 | R_4 | R_5 | R_6 | R_7 | R_8
   Av. yield   | 781 | 918 | 833 | 837 | 797 | 626 | 537 | 560
   S.E./mean   = 48.7 lb./ac.

   Crop: Rozelle (Kharif).
   Ref: J.A.R.I. 56(7).
   Type: 'C'.

Object: To study the effect of seed rate on the yield of Rozelle fibre.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilgai.
(iii) 27.5.1956. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) As per treatments. (d) and
(e) N.A. (v) 3 tons/ac. of compost. (vi) M.T.—129 (medium). (vii) Unirrigated. (viii) 2 weedings. (ix)
N.A. (x) 27.9.1956.

2. TREATMENTS to 4. GENERAL:
Same as in expl. no. 54(b) on page 220.

5. RESULTS:
(i) 621 lb./ac. (ii) 82.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre
in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>R₅</th>
<th>R₆</th>
<th>R₇</th>
<th>R₈</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>564</td>
<td>545</td>
<td>710</td>
<td>659</td>
<td>642</td>
<td>633</td>
<td>629</td>
<td>623</td>
</tr>
</tbody>
</table>

S.E./mean = 36.7 lb./ac.

_Crop:_ Rozelle (Kharif).
_Type:_ 'C'.

Object:—To study the effect of seed rate on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilgal.
(iii) 20.5.1954. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) As per treatments. (d) and
(e) N.A. (v) 3 tons/ac. of T.C. (vi) H. Shibani. (vii) Unirrigated. (viii) 2 weedings. (ix) 8.12.1954,
(x) 27.9.1955.

2. TREATMENTS:
8 seed rates: R₁ = 5, R₂ = 10, R₃ = 15, R₄ = 20, R₅ = 25, R₆ = 30, R₇ = 35 and R₈ = 40 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 8'. (b) 134° x 24'. (iii) 5'. (iv) (a) 24° x 15'. (b) 22° x 13'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) Nil. (iii) Green and dry fibre weight, stand count, base diameter and plant height, (iv) (a)
1952—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1699 lb./ac. (ii) 164.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry
fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>R₅</th>
<th>R₆</th>
<th>R₇</th>
<th>R₈</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1755</td>
<td>1843</td>
<td>1917</td>
<td>1725</td>
<td>1665</td>
<td>1622</td>
<td>1549</td>
<td>1518</td>
</tr>
</tbody>
</table>

S.E./mean = 73.7 lb./ac.

_Crop:_ Rozelle (Kharif).
_Type:_ 'C'.

Object:—To study the effect of different seed rates on the yield of Rozelle.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.
(iii) 4.6.1955. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) As per treatments. (d) and
2. TREATMENTS to 4. GENERAL:
Same as in expn. no. 54(5) on page 223.

5. RESULTS:
(i) 1240 lb./ac. (ii) N.A. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>R₁</td>
<td>1142</td>
</tr>
<tr>
<td>R₂</td>
<td>1275</td>
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<tr>
<td>R₃</td>
<td>1376</td>
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<td>R₄</td>
<td>1332</td>
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<td>R₅</td>
<td>1243</td>
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<tr>
<td>R₆</td>
<td>1331</td>
</tr>
<tr>
<td>R₇</td>
<td>1167</td>
</tr>
<tr>
<td>R₈</td>
<td>1061</td>
</tr>
</tbody>
</table>

S.E./mean = N.A.

Crop :- Rozelle (Kharif).
Object :- To study the effect of seed rate on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.
(iii) 4.6.1956. (iv) (a) 4 to 6 ploughings and ladderings. (b) broadcast. (c) As per treatments. (d) and (e) N.A. (v) 3 tons/ac. of compost. (vi) R.T.—2 (medium). (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 14.12.1956.

2. TREATMENTS to 4. GENERAL:
Same as in expn. no. 54(5) on page 223.

5. RESULTS:
(i) 1378 lb./ac. (ii) 364.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>R₁</td>
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<td>R₂</td>
<td>1569</td>
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<tr>
<td>R₃</td>
<td>1423</td>
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<tr>
<td>R₄</td>
<td>1368</td>
</tr>
<tr>
<td>R₅</td>
<td>1314</td>
</tr>
<tr>
<td>R₆</td>
<td>1277</td>
</tr>
<tr>
<td>R₇</td>
<td>1185</td>
</tr>
</tbody>
</table>

S.E./mean = 161.9 lb./ac.

Crop :- Rozelle (Kharif).
Object :- To study the effect of seed rate on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.
(iii) 4.6.1957. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) As per treatments. (d) and (e) N.A. (v) 3 tons/ac. of compost. (vi) R.T.—2 (medium). (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 21.11.1957.

2. TREATMENTS to 4. GENERAL:
Same as in expn. no. 54(5) on page 223.

5. RESULTS:
(i) 1561 lb./ac. (ii) 181.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>R₁</td>
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<tr>
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<tr>
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<td>R₄</td>
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<td>R₇</td>
<td>1580</td>
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<tr>
<td>R₈</td>
<td>1584</td>
</tr>
</tbody>
</table>

S.E./mean = 81.2 lb./ac.
Crop :- Rozelle (Kharif).


Object :- To study the effect of different spacings on the yield of Rozelle fibre.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Rozelle. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 24.5.1954.
   (iv) (a) 4 to 6 ploughings and laddernings. (b) Line sowing by drill. (c) N.A. (d) As per treatments. (e)
   1. (v) 3 tons/ac. of T.C. (vi) H. Sabdariffa. (vii) Unirrigated. (viii) 2 weedings and thinnings. (ix) 43.68'. (x) 2.12.1954.

2. TREATMENTS:
   All combinations of (1) and (2) + a control
   (1) 5 spacings between lines : S1 =4', S2 =6', S3 =9', S4 =12' and S5 =15'.
   (2) 3 spacing within lines : C1 =2', C2 =4' and C3 =6'.
   Control = Broadcast

3. DESIGN:
   (i) R.B.D. (ii) (a) 16. (b) 46' X 66'. (iii) 4. (iv) (a) 13' X 10'. (b) 13' X 8'. (v) 1' X 1'. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Green and dry fibre weight, stand count, base diameter and plant height. (iv) (a) 1954 - 1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2447 lb./ac. (ii) 320.3 lb./ac. (iii) Main effect of C and 'control vs. others' are significant. (iv) Av.
   yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>2158</td>
<td>2248</td>
<td>2425</td>
<td>2473</td>
<td>2355</td>
<td>2332</td>
</tr>
<tr>
<td>C2</td>
<td>2453</td>
<td>2349</td>
<td>2469</td>
<td>2609</td>
<td>2355</td>
<td>2487</td>
</tr>
<tr>
<td>C3</td>
<td>2533</td>
<td>2599</td>
<td>2788</td>
<td>2678</td>
<td>2434</td>
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<td>2381</td>
<td>2465</td>
<td>2561</td>
<td>2587</td>
<td>2381</td>
<td>2475</td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 92.5 lb./ac.
S.E. of C marginal mean = 7.6 lb./ac.
S.E. of body of table or control mean = 160.2 lb./ac.

Crop :- Rozelle (Kharif).


Object :- To study the effect of different spacings on the yield of Rozelle fibre.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Rozelle. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 6.6.1955.
   (iv) (a) 4 to 6 ploughings and laddernings. (b) Line sowing by hand. (c) 10 lb./ac. (d) As per treatments. (e)

2. TREATMENTS:
   All combinations of (1) and (2) + a control
   (1) 5 spacings between lines : S1 =4', S2 =6', S3 =9', S4 =12' and S5 =15'.
   (2) 3 spacings within lines : C1 =2', C2 =4' and C3 =6'.
   Control = Broadcast.
3. DESIGN:
(i) R.B.D. (ii) (a) 16. (b) 46' x 66'. (iii) 4. (iv) (a) and (b) 15' x 10'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) Nil. (iii) Yield of dry fibre and sticks. (iv) (a) 1954—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1816 lb./ac. (ii) 260.8 lb./ac. (iii) Main effect of C alone is significant. (iv) Av. yield of dry fibre in lb./ac.

Control = 1852 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>1567</td>
<td>1624</td>
<td>1750</td>
<td>1682</td>
<td>1762</td>
<td>1677</td>
</tr>
<tr>
<td>C2</td>
<td>1908</td>
<td>1985</td>
<td>2007</td>
<td>1911</td>
<td>1751</td>
<td>1912</td>
</tr>
<tr>
<td>C3</td>
<td>1894</td>
<td>2118</td>
<td>1718</td>
<td>1879</td>
<td>1653</td>
<td>1852</td>
</tr>
<tr>
<td>Mean</td>
<td>1790</td>
<td>1909</td>
<td>1825</td>
<td>1824</td>
<td>1722</td>
<td>1814</td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 75.3 lb./ac.
S.E. of C marginal mean = 58.3 lb./ac.
S.E. of body of table or control mean = 150.4 lb./ac.

Crop: Rozelle (Kharif).

Ref: J.A.R.I. 56(8).
Type: 'C'.

Object: To study the effect of different spacings on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilgani.
(iii) 27.6.1956. (iv) (a) 4 to 6 ploughings and laddering. (b) Line sowing by hand. (c) 10 lb./ac. (d) As per treatments. (e) 1. (f) 3 tons/ac. of compost. (g) R.T.—1 (mid June). (h) Unirrigated. (i) 2 weedings and 1 thinning. (j) N.A. (k) 12.12.1956.

2. TREATMENTS

Same as in expl. no. 55(5) on page 225.

4. GENERAL:
(i) Fair. (ii) Occurrence of stem rot. Perenox spray was given. (iii) Yield of dry fibre and sticks. (iv) (a) 1954—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 655 lb./ac. (ii) 119.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of dry fibre in lb./ac.

Control = 718 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
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<td>655</td>
<td>715</td>
<td>637</td>
<td>631</td>
<td>691</td>
</tr>
<tr>
<td>C2</td>
<td>682</td>
<td>729</td>
<td>791</td>
<td>709</td>
<td>732</td>
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<td>661</td>
<td>706</td>
<td>667</td>
<td>613</td>
<td>664</td>
<td>662</td>
</tr>
<tr>
<td>Mean</td>
<td>720</td>
<td>696</td>
<td>724</td>
<td>653</td>
<td>676</td>
<td>694</td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 34.6 lb./ac.
S.E. of C marginal mean = 26.8 lb./ac.
S.E. of body of table or control mean = 59.9 lb./ac.
Crop: Rozelle (Kharif).
Object: To study the effect of different spacings on the yield of Rozelle fibre.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.
   (iii) 13.6.1957. (iv) (a) 4 to 6 ploughings and ladderings. (b) Line sowing. (c) N.A. (d) As per treatments.

2. TREATMENTS to 4. GENERAL:
   Same as in expl. no. 55(5) on page 225.

5. RESULTS:
   (i) 1103 lb./ac. (ii) 164.3 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of dry fibre
   in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1404</td>
<td>1406</td>
<td>1323</td>
<td>1230</td>
<td>1187</td>
<td>1310</td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 47.4 lb./ac.
S.E. of C marginal mean = 36.7 lb./ac.
S.E. of body cf table or control mean = 82.2 lb./ac.

Crop: Rozelle (Kharif).
Object: To study the possibility of growing 2nd crop after harvest of Rozelle.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.
   (iii) 6.5.1958. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) 20 lb./ac. (d) 4" x 4". (e) 1,
   (v) 3 tons/ac. of compost before sowing of Rozelle. (vi) R.T.—2 (medium). (vii) Unirrigated. (viii) 2 weedings
   and 1 thinning. (ix) 35.71". (x) As per treatments.

2. TREATMENTS:
   5 times of harvest of Rozelle : T₁ = 120, T₂ = 140, T₃ = 160, T₄ = 180 days after sowing and T₅ = (Usual)
time (at pod stage).
   in T₅.

3. DESIGN:
   (i) L. Sq. (ii) (a) 5. (b) 12" x 118". (iii) 5. (iv) (a) 24" x 22". (b) 22" x 20". (v) 1" x 1". (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Green and dry fibre weight, stand count, plant height and base diameter. (iv) (a)
   1958—1960. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1878 lb./ac. (ii) 165.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre
   in lb./ac.
Crop: Rozelle (Kharif)  
Ref: J.A.R.I. 59(4).  
Type: C.

Object: To study the possibility of growing 2nd crop after harvest of Rozelle.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Rozelle. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 4.6.1959. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) 20 lb./ac. (d) 4"x4". (e) 1. (v) 3 tons/ac. of compost before sowing of Rozelle. (vi) R.T.—2 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) S.E./mean = 73.9 lb./ac.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 58(4) on page 227.

Kali-kalai as second crop sown on 7.10.1959, 23.10.1959, 13.11.1959 and 2.12.1959 respectively.

5. RESULTS:
   (i) 1108 lb./ac. (ii) 73.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>582</td>
<td>938</td>
<td>1086</td>
<td>1004</td>
<td>1110</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>32.9 lb./ac.</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Crop: Jute (Kharif)  
Site: Jute Res. Sub-Stn., Kendrapara.  
Ref: J.A.R.I. 59(25).  
Type: M.

Object: To study the effect of different sources and times of application of N on Jute.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jute. (c) Nil. (ii) Recent alluvium. (b) N.A. (iii) 30.5.1959. (iv) (a) 5 ploughings, ladderings and harrowings. (b) Drilling. (c) 3.5 lb./ac. (d) 12½x3½. (e) N.A. (v) 4000 lb./ac. of compost at the time of land preparation. (vi) J.R.O.—632 (late). (vii) Unirrigated. (viii) 3 weedings, 2 thinnings and 3 wheel hoeings. (a) N.A. (a) 13.10.1959.

2. TREATMENTS:
   All combinations of (1) and (2)+a control
   (1) 2 sources of 20 lb./ac. of N: S1=A/S and S2=Urea.
   (2) 2 times of application of N: T1=30 days after sowing and T2=Top dressed at sowing.
   The fertilizers were sprayed 5 times at an interval of 3 days to make up the total amount.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 25'x22'. (b) 23'x29'. (v) 1'x1'. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Yield of dry jute fibre. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 1022 lb./ac. (ii) 224.9 lb./ac. (iii) "Control vs. others" alone is significant. (iv) Av. yield of dry fibre in lb./ac.
Control = 816 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1041</td>
<td>1157</td>
<td>1099</td>
</tr>
<tr>
<td>S2</td>
<td>1078</td>
<td>1021</td>
<td>1049</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 92.7 lb./ac.
S.E. of body of table or control mean = 112.4 lb./ac.

Crop: Jute (Kharif).
Site: Jute Res. Sub. Stn., Kendrapara.

Object: To study the effect of different sources and times of application of N on Jute.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jute. (c) Nil. (ii) (a) Recent alluvium. (b) N.A. (iii) 31.5.1959. (iv) (a) 5 ploughings, laddering and harrowings. (b) Drilling. (c) 3.5 lb./ac. (d) 12"x3". (e) N.A. (v) 4000 lb./ac. of compost (vi) J.R.C.—212 (late). (vii) Unirrigated. (viii) 3 weedings, 2 thinnings and 3 wheel hoeings. (ix) N.A.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 59(25) on page 228.

5. RESULTS:
   (i) 1143 lb./ac. (ii) 586.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of dry fibre in lb./ac.

Control = 849 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
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<tbody>
<tr>
<td>S1</td>
<td>677</td>
<td>1473</td>
<td>1075</td>
</tr>
<tr>
<td>S2</td>
<td>1226</td>
<td>1488</td>
<td>1357</td>
</tr>
</tbody>
</table>

Mean = 952

S.E. of any marginal mean = 241.8 lb./ac
S.E. of body of table or control mean = 293.2 lb./ac.

Crop: Jute (Kharif).
Site: Jute Res. Sub. Stn., Kendrapara.

Object: To study the effect of N, P and K on Jute yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Recent alluvium. (b) N.A. (iii) 11.6.1959. (iv) (a) 4 to 5 ploughings, laddering and harrowing by country method. (b) Drilling. (c) 4.5 lb./ac. (d) 12"x3". (e) N.A. (v) 4000 lb./ac. of cowdung. (vi) J.R.C.—212 (late). (vii) Unirrigated. (viii) 3 weedings, 3 thinnings and 5 wheel hoeings. (ix) N.A. (x) 25, 26 and 28.9.1959.
2. TREATMENTS:

12 levels of manure: M0 = 0, M1 = 20 lb./ac. of N, M2 = 40 lb./ac. of N, M3 = 60 lb./ac. of N, M4 = 80 lb./ac. of N, M5 = 10 lb./ac. of P2O5, M6 = 20 lb./ac. of N+10 lb./ac. of P2O5, M7 = 30 lb./ac. of K2O, M8 = 40 lb./ac. of N+20 lb./ac. of P2O5+20 lb./ac. of K2O, M9 = 50 lb./ac. of K2O, M10 = 60 lb./ac. of N+30 lb./ac. of P2O5+30 lb./ac. of K2O, M11 = 70 lb./ac. of N+40 lb./ac. of P2O5+40 lb./ac. of K2O, M12 = 80 lb./ac. of N+50 lb./ac. of P2O5+50 lb./ac. of K2O. 

N as A/S top dressed in 2 doses, half 3 to 4 weeks and other half 6 to 7 weeks after sowing.

P2O5 as Super and K2O as Pot. Sul. applied at sowing. N as A/S top dressed in 2 doses, half 3 to 4 weeks and other half 6 to 7 weeks after sowing.

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 25' x 24'. (b) 22' x 20'. (v) 2' x 2'. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Incidence of semilooper insects. Endrex spraying was done. (iii) Yield of dry jute fibre. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS:

(i) 1560 lb./ac. (ii) 209.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0</td>
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</tr>
<tr>
<td>S1</td>
<td>1034</td>
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<tr>
<td>S2</td>
<td>1716</td>
</tr>
<tr>
<td>S3</td>
<td>1984</td>
</tr>
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<td>S4</td>
<td>1984</td>
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<td>S5</td>
<td>1838</td>
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<td>S6</td>
<td>478</td>
</tr>
<tr>
<td>S7</td>
<td>1139</td>
</tr>
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<td>S8</td>
<td>1717</td>
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<tr>
<td>S9</td>
<td>2130</td>
</tr>
<tr>
<td>S10</td>
<td>2023</td>
</tr>
<tr>
<td>S11</td>
<td>1953</td>
</tr>
</tbody>
</table>

S.E.(mean) = 85.5 lb./ac.

Crop :- Jute (Kharif).


Ref :- J.A.R.I. 55(6).

Object :- To study the effect of foliar application of different sources of N on Jute yield.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Jute. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 15.8.1956. (iv) (a) 4 to 6 ploughings and ladderings. (b) Drilling. (c) 3.5 lb./ac. (d) 12" x 4". (e) 1. (f) Nil. (g) C.G. (medium). (h) Unirrigated. (i) 2 weedings and 1 thinning. (ii) N.A. (iii) 31.8.1956.

2. TREATMENTS:

4 sources of 0.1 % of available N as foliar spray: S1 = Control (no spray) S2 = A/S, S3 = Pot. Nitrate and S4 = Urea

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) 10' x 15'. (b) 8' x 13'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of dry jute fibre and stick. (iv) (a) 1956-1960 (with changed treatments). (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1174 lb./ac. (ii) 283.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of dry jute fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0</td>
<td>1219</td>
</tr>
<tr>
<td>S1</td>
<td>1102</td>
</tr>
<tr>
<td>S2</td>
<td>1934</td>
</tr>
<tr>
<td>S3</td>
<td>2191</td>
</tr>
<tr>
<td>S4</td>
<td>2303</td>
</tr>
</tbody>
</table>

S.E.(mean) = 163.8 lb./ac.
Crop :- Jute (Kharif).

Object :- To study the effect of foliar application of different sources of N on Jute yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jute. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 8.9.1956. (iv) (a) 4 to 6 ploughings and ladderings. (b) Drilling. (c) 3 revs/ac. (d) 12" x 4". (e) 1. (v) Nil. (vi) D = 154 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) N.A. (x) 8.9.1956.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 56(6) on page 230.

5. RESULTS:
   (i) 1659 lb./ac. (ii) 2184 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of dry fibre in lb./ac.

   Treatment | S0 | S1 | S2 | S3 | S4
   Av. yield  | 1290 | 1620 | 1529 | 2197 | 126.1 lb./ac.

Crop :- Jute (Kharif).

Object :- To study the effect of foliar application of different sources of N on Jute yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jute. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 9.6.1957. (iv) (a) 4 to 6 ploughings and ladderings. (b) Drilling. (c) 3.5 revs/ac. (d) 12" x 4". (e) 1. (v) Nil. (vi) J.R.O- 632 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) N.A. (x) 25.9.1957.

2. TREATMENTS:
   5 sources of 0.1 % of available N as foliar spray : S0 = Control (no spray), S1 = A, S2 = Pot. Nitrate, S3 = Urea and S4 = A.C.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 8" x 12". (b) 6" x 18". (v) 1" x 1". (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of dry jute fibre and stick. (iv) (a) 1956-1957 with changed treatments). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 3721 lb./ac. (ii) 667.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb./ac.

   Treatment | S0 | S1 | S2 | S3 | S4
   Av. yield  | 3724 | 3758 | 4166 | 4293 | 3163

S.E./mean = 331.4 lb./ac.
1. BASAL CONDITIONS:

(i) (a) Nil. (b) Jute. (c) 3 tons/ac of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 9.6.1957. (iv) (a) 4 to 6 ploughings and ladderings. (b) Drilling. (c) 5 lb/ac. (d) 12'×4'. (e) 1. (v) Nil. (vi) D—154 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) N.A. (x) 25.9.1957.

2. TREATMENTS to 4. GENERAL:

Same as in exp. no. 57(5) on page 231.

3. RESULTS:

(i) 3577 lb/ac. (ii) 364.8 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>3574</td>
<td>3753</td>
<td>3668</td>
<td>4381</td>
<td>2258</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>432.4 lb/ac.</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>


Ref: J.A.R.I. 58(2). Type: M'.

Object: To study the effect of foliar application of different sources of N on Jute yield.

4. BASAL CONDITIONS:

(i) (a) Nil. (b) Jute. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 6.5.1958. (iv) (a) 4 to 6 ploughings and ladderings. (b) Drilling. (c) 3.5 lb/ac. (d) 12'×4'. (e) 1. (v) Nil. (vi) J.R.O—1032 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) N.A. (x) 3.9.1958.

2. TREATMENTS:

6 sources of 0.1 % of available N as foliar spray: S0=Control (no spray), S1=A/S, S2=Pot. Nitrate, S3=Urea, S4=A/C and S5=A/S/N.

3. DESIGN:

(i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) 12'×10'. (b) 10'×8'. (v) Y×Y'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of dry fibre and stick. (iv) (a) 1956-1960 (with changed treatments). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 5666 lb/ac. (ii) 554.7 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>5554</td>
<td>5907</td>
<td>5630</td>
<td>5753</td>
<td>5538</td>
<td>5737</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>277.3 lb/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Ref: J.A.R.I. 58(3). Type: M'.

Object: To study the effect of foliar application of different sources of N on Jute yield.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jute. (c) Nil. (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 6.5.1959. (iv) (a) 4 to 6 ploughings and ladderings. (b) Drilling. (c) 5 lb/ac. (d) 12'x4'. (e) 1. (v) Nil. (vi) D. - 154. (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) N.A. (x) 2.9.1958.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 58(2) on page 232.

3. RESULTS:
   (i) 4891 lb/ac. (ii) 694.4 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S_0</th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
<th>S_5</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>4500</td>
<td>5001</td>
<td>5366</td>
<td>4787</td>
<td>4979</td>
<td>4714</td>
</tr>
</tbody>
</table>

   S.E./mean = 147.2 lb/ac.

Ref: J.A.R.I. 59(2).
Type: - 'M'.
Object: -To compare the effect of foliar application and top dressing of different sources of N on the yield of Jute fibre.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jute. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 28.5.1959. (iv) (a) 4 to 6 ploughings and ladderings. (b) Broadcast. (c) N.A. (d) 4'x4'. (e) 1. (v) Super at 30 lb/ac. of P_2O_5 and Mur. Pot. at 40 lb/ac. of K_2O. (vi) J.R.O.—632. (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) 8.7.9. (x) 8.9.1959.

2. TREATMENTS:
   5 sources of 20 lb/ac. of N : N_0 = Control (no application), N_1 = A/S foliar spray, N_2 = A/S top dressed, N_3 = Urea foliar spray and N_4 = Urea top dressed.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 25'x22'. (b) 23'x20'. (v) 1'x1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Green and dry fibre yield, plant height, stand count and base diameter. (iv) (a) 1956—1960 (with changed treatments). (b) N.a. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2225 lb/ac. (ii) 153.0 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>N_3</th>
<th>N_4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2161</td>
<td>2218</td>
<td>2280</td>
<td>2256</td>
<td>2231</td>
</tr>
</tbody>
</table>

   S.E./mean = 76.5 lb/ac.

Ref: J.A.R.I. 59(3).
Type: - 'M'.
Object: -To compare the effect of foliar application and top dressing of different sources of N on the yield of Jute fibre.
1. BASAL CONDITIONS:

(i) Nil. (b) Mustard. (c) Ref soil analysis, Nilganj. (ii) 28.5.1959. (iv) (a) 4 to 6 ploughings and ladderings. (b) Drilling. (c) N.A. (d) 4'×4'. (e) Nil. (v) Super at 30 lb./ac. of P₂O₅ and Mur. Pot. at 40 lb./ac. of K₂O. (vi) J.R.C.—212. (vii) Unirrigated. (viii) 1 thinning. (ix) 8.12.5. (x) 9.9.1959.

2. TREATMENTS:

Same as in expt. no. 59(2) on page 233.

3. RESULTS:

(i) 2306 lb./ac. (ii) 139.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>No</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
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<tr>
<td>Av. yield</td>
<td>2153</td>
<td>2231</td>
<td>2398</td>
<td>2385</td>
<td>2359</td>
</tr>
</tbody>
</table>
| S.E./mean | 70.0 lb./ac.

Crop: Jute. (Kharif).
Ref: J.A.R.I. 54(11).
Type: M'.

Object: To study the effect of different levels of N, P and K on the yield of Jute fibre.

1. BASAL CONDITIONS:

(i) (a) Jute.—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 10.5.1954. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb./ac. (d) 12"×3". (e) J. (v) D.—154 (early). (vi) Unirrigated. (vii) 1 weeding, 1 thinning and 4 wheel hoeings. (viii) 43.68". (x) 21.0.1954.

2. TREATMENTS:

All combinations of (i), (2) and (3)

(i) 3 levels of N as A/S: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
(ii) 2 levels P₂O₅ as Super: P₀ = 0 and P₁ = 40 lb./ac.
(iii) 2 levels of K₂O as Mur. Pot.: K₀ = 0 and K₁ = 25 lb./ac.

3. DESIGN:

(i) Facts in R.B.D. (ii) (a) 12. (b) 130'×70'. (iii) 4. (iv) (a) 20'×34'. (b) 18'×32'. (v) 1'×1'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Dusting and spraying of DDT and other insecticides. (iii) Green and dry fibre yield, stand counts and average height. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) Yes.

5. RESULTS:

(i) 1862 lb./ac. (ii) 206.7 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
</tr>
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<tbody>
<tr>
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<td>1647</td>
<td>1626</td>
<td>1600</td>
</tr>
<tr>
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<td>N₂</td>
<td>2241</td>
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<td>2155</td>
<td>2057</td>
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<tr>
<td>Mean</td>
<td>1866</td>
<td>1556</td>
<td>1861</td>
<td>1825</td>
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<table>
<thead>
<tr>
<th>K₀</th>
<th>K₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>1842</td>
<td>1808</td>
</tr>
<tr>
<td>1890</td>
<td>1905</td>
</tr>
</tbody>
</table>
Object: To study the effect of different levels of N, P and K on the yield of Jute fibre.

1. BASAL CONDITIONS:
   (i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 6.6.1955. (iv) (a) 4 to 5 ploughings and laddering. (b) Drilling. (c) 5 lb./ac. (d) 12" x 3". (e) 1. (f) Nil. (v) D—154 (early). (vi) Unirrigated. (vii) 1 weeding, 1 thinning and 4 wheel hoeings. (ix) 61.75*. (x) 6 1/2 day.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 54(11) on page 234.

3. RESULTS:
   (i) 1593 lb./ac. (ii) 168.1 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>Mean</th>
<th>K₀</th>
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<td>N₁</td>
<td>1557</td>
<td>1554</td>
<td>1556</td>
<td>1550</td>
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</tr>
<tr>
<td>N₂</td>
<td>1842</td>
<td>1802</td>
<td>1822</td>
<td>1820</td>
<td>1824</td>
</tr>
</tbody>
</table>

Mean 1587 1598 1593 1594 1592

S.E. of N marginal mean = 46.5 lb./ac.
S.E. of P or K marginal mean = 38.0 lb./ac.
S.E. of body of N×P or N×K table = 65.8 lb./ac.
S.E. of body of P×K table = 57.7 lb./ac.

Object: To study the effect of different levels of N, P and K on the yield of Jute fibre.

1. BASAL CONDITIONS:
   (i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (i) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 25.5.1954. (iv) (a) 4 to 5 ploughings and laddering. (b) Drilling. (c) 5 lb./ac. (d) 12" x 3". (e) 1. (f) Nil. (vii) Unirrigated. (viii) 1 weeding, 1 thinning and 4 wheel hoeings. (ix) 30.5.1954.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 54(11) on page 234.
5. **RESULTS:**

(i) 2016 lb./ac. (ii) 2161 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1776</td>
<td>1962</td>
<td>1869</td>
<td>1874</td>
<td>1854</td>
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<tr>
<td>N₁</td>
<td>2161</td>
<td>2150</td>
<td>2155</td>
<td>2162</td>
<td>2149</td>
</tr>
<tr>
<td>N₂</td>
<td>2048</td>
<td>2000</td>
<td>2024</td>
<td>1960</td>
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<tr>
<td>Mean</td>
<td>1995</td>
<td>2037</td>
<td>2016</td>
<td>1999</td>
<td>2034</td>
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<td>K₀</td>
<td>1969</td>
<td>2029</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>K₁</td>
<td>2022</td>
<td>2046</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of N marginal mean = 50.4 lb./ac.
S.E. of P or K marginal mean = 41.1 lb./ac.
S.E. of body of N × P or N × K table = 71.2 lb./ac.
S.E. of body of K × P table = 58.2 lb./ac.

**Crop:** Jute (*Kharif*).  **Site:** Jute Agri. Res. Instt., Nilganj.  **Ref:** J.A.R.I. 55(10).  **Type:** ‘M’.

Object:—To study the effect of different levels of N, P and K on the yield of Jute fibre.

1. **BASAL CONDITIONS:**

(i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 4 6.1955. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb./ac. (d) 12” x 3”. (e) 1. (v) Nil. (vi) J.R.O.—632 (medium). (vii) Unirrigated. (viii) 1 weeding, 1 thinning and 4 wheel hoeings. (ix) 6 7.1955. (x) 27 9.1955.

2. **TREATMENTS** to 4. **GENERAL:**

Same as in sept. no. 54(11) on page 234.

5. **RESULTS**:

(i) 1950 lb./ac. (ii) 142.1 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of dry fibre is lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1702</td>
<td>1851</td>
<td>1776</td>
<td>1671</td>
<td>1882</td>
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<td>1943</td>
<td>1941</td>
<td>1942</td>
<td>1947</td>
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<tr>
<td>Mean</td>
<td>1859</td>
<td>1941</td>
<td>1900</td>
<td>1870</td>
<td>1930</td>
</tr>
<tr>
<td>K₀</td>
<td>1788</td>
<td>1952</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K₁</td>
<td>1930</td>
<td>1931</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of N marginal mean = 35.5 lb./ac.
S.E. of P or K marginal mean = 29.0 lb./ac.
S.E. of body of N × P or N × K table = 50.2 lb./ac.
S.E. of body of P × K table = 41.0 lb./ac.
Crop :- Jute (Kharif).
Ref :- J.A.R.I. 56(11).
Type :- 'M'.

Object :- To study the effect of different sources and times of application of N on the yield of Jute fibre.

1. BASAL CONDITIONS:
   (i) (a) Jute-Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 14.6.1956. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb/ac. (d) 12"x3'. (e) 1. (v) Nil. (vi) J.R.C.—212 (medium). (vii) Unirrigated. (viii) 2 weedings, 2 thinnings and 4 to 6 wheel hoerings.
   (ix) N.A. (x) 25.10.1956.

2. TREATMENTS:
   Main-plot treatments:
   5 sources of 40 lb/ac. of N:
   $S_1$ = A/S, $S_2$ = A/C, $S_3$ = Urea, $S_4$ = C/N and $S_5$ = A/S/N.

   Sub-plot treatments:
   7 times of application:
   $T_1$ = At sowing, $T_2$ = 3 weeks after sowing, $T_3$ = 6 weeks after sowing, $T_4$ = Half at sowing + half 3 weeks after sowing, $T_5$ = Half at sowing + half 6 weeks after sowing, $T_6$ = Half 3 weeks after sowing + half 6 weeks after sowing and $T_7$ = 3 dose at sowing 3 dose 3 weeks after sowing and 3 dose 6 weeks after sowing.

3. DESIGN:
   (i) Split-plot. (ii) (a) 5 main-plots/replication; 7 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 18'x23', (b) 16'x21'. (v) 1'x1'. (vi) Yes.

4. GENERAL:
   (i) Fum. (ii) Dusting and spraying of DDT and other insecticides. (iii) Stand count, average height, green and dry fibre yield. (iv) (a) 1956—1960. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1855 lb/ac. (ii) (a) 857.7 lb/ac. (b) 286.6 lb/ac. (iii) Main effect of $T$ alone is significant. (iv) Av. yield of dry fibre in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
<th>Mean</th>
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<tbody>
<tr>
<td>$S_1$</td>
<td>1841</td>
<td>1821</td>
<td>2144</td>
<td>1987</td>
<td>2130</td>
<td>2203</td>
<td>2185</td>
<td>2045</td>
</tr>
<tr>
<td>$S_2$</td>
<td>2234</td>
<td>1659</td>
<td>1648</td>
<td>1977</td>
<td>1929</td>
<td>2044</td>
<td>1919</td>
<td></td>
</tr>
<tr>
<td>$S_3$</td>
<td>1819</td>
<td>1551</td>
<td>1785</td>
<td>1605</td>
<td>1972</td>
<td>1551</td>
<td>2014</td>
<td>1855</td>
</tr>
<tr>
<td>$S_4$</td>
<td>1369</td>
<td>1639</td>
<td>1669</td>
<td>1562</td>
<td>1768</td>
<td>1999</td>
<td>2058</td>
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<td>$S_5$</td>
<td>1714</td>
<td>1526</td>
<td>1293</td>
<td>1735</td>
<td>1839</td>
<td>1758</td>
<td>2014</td>
<td>1703</td>
</tr>
</tbody>
</table>

Mean

1799 1699 1708 1813 1928 1983 2056 1855

S.E. of difference of two

1. S marginal means = 204.7 lb/ac.
2. T marginal means = 104.6 lb/ac.
3. T means at the same level of S = 234.0 lb/ac.
4. S means at the same level of T = 147.0 lb/ac.

Crop :- Jute (Kharif).
Ref :- J.A.R.I. 57(9).
Type :- 'M'.

Object :- To study the effect of different sources and times of application of N on the yield of Jute fibre.

1. BASAL CONDITIONS:
   (i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 11.6.1957. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb/ac. (d) 12"x3'. (e) 1. (v) Nil. (vi) J.R.C.—212 (medium). (vii) Unirrigated. (viii) 2 weedings, 2 thinnings and 4 to 6 wheel hoerings.
   (ix) N.A. (x) 24.10.1957.
2. TREATMENTS to 4. GENERAL:
Same as in expt, no. 56(11) on page 237.

5. RESULTS:
(i) 1725 lb./ac.  
(ii) (a) 153.8 lb./ac.  
(b) 213.6 lb./ac.  
(iii) Main effect of S alone is significant.  
(iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1794</td>
<td>1638</td>
<td>1744</td>
<td>1687</td>
<td>1827</td>
<td>1744</td>
<td>1860</td>
</tr>
<tr>
<td>S2</td>
<td>1938</td>
<td>1670</td>
<td>1687</td>
<td>1860</td>
<td>1827</td>
<td>1786</td>
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<tr>
<td>S3</td>
<td>1580</td>
<td>1827</td>
<td>1489</td>
<td>1551</td>
<td>2095</td>
<td>1876</td>
<td>1810</td>
</tr>
<tr>
<td>S4</td>
<td>1695</td>
<td>1786</td>
<td>1761</td>
<td>1720</td>
<td>1687</td>
<td>1786</td>
<td>1679</td>
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<tr>
<td>S5</td>
<td>1613</td>
<td>1498</td>
<td>1736</td>
<td>1489</td>
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<tr>
<td>Mean</td>
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<td>1684</td>
<td>1683</td>
<td>1662</td>
<td>1725</td>
<td>1794</td>
<td>1829</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. S marginal means = 27.5 lb./ac.
2. T marginal means = 78.0 lb./ac.
3. T means at the same level of S = 74.4 lb./ac.
4. S means at the same level of T = 168.3 lb./ac.

Crop = Jute (Kharif).
Object = To study the effect of different sources and times of application of N on the yield of Jute fibre.

1. BASAL CONDITIONS:
(i) (a) Jute—Mustard.  
(b) Mustard.  
(c) Nil.  
(ii) (a) Sandy loam.  
(b) Refer soil analysis, Nilganj.  
(iii) 28.5.1959.  
(iv) (a) 4 to 5 ploughings and laudering.  
(b) Drilling.  
(c) 5 lb./ac.  
(d) 12" x 3".  
(e) 1.  
(f) Nil. (v) J.R.C.—212 (medium).  
(vi) Unirrigated.  
(vii) 2 weedings, 2 thinnings and 4 to 6 wheel hoeings.  
(viii) 84.72°.  
(ix) 20.10.1959.

2. TREATMENTS to 4. GENERAL:
Same as in expt, no. 56(11) on page 237.

5. RESULTS:
(i) 2428 lb./ac.  
(ii) (a) 480.0 lb./ac.  
(b) 140.0 lb./ac.  
(iii) Main effect of T alone is highly significant.  
(iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>2680</td>
<td>2331</td>
<td>2172</td>
<td>2488</td>
<td>2607</td>
<td>2417</td>
</tr>
<tr>
<td>S2</td>
<td>2503</td>
<td>2109</td>
<td>2300</td>
<td>2376</td>
<td>2295</td>
<td>2362</td>
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<tr>
<td>S3</td>
<td>2641</td>
<td>2530</td>
<td>2497</td>
<td>2478</td>
<td>2461</td>
<td>2545</td>
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<tr>
<td>S4</td>
<td>2572</td>
<td>2395</td>
<td>2321</td>
<td>2390</td>
<td>2493</td>
<td>2376</td>
</tr>
<tr>
<td>S5</td>
<td>2586</td>
<td>2343</td>
<td>2207</td>
<td>2336</td>
<td>2488</td>
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<tr>
<td>Mean</td>
<td>2597</td>
<td>2382</td>
<td>2279</td>
<td>2418</td>
<td>2469</td>
<td>2418</td>
</tr>
</tbody>
</table>
S.E. of difference of two

1. $S_m$ marginal means = 148.1 lb./ac.
2. $T_m$ marginal means = 51.1 lb./ac.
3. $T$ means at the same level of $S$ = 114.3 lb./ac.
4. $S$ means at the same level of $T$ = 182.0 lb./ac.

Crop: Jute (Kharij).


Ref: J.A.R.I. 54(7).

Type: 'M'.

Object: To study the effect of different times of application of A/S on the yield of Jute fibre.

1. BASAL CONDITIONS:

(i) (a) Jute - Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 24.5.1954. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb./ac. (d) 12" x 3". (e) 1. (v) Nil. (vi) J.R.C.- 212 (medium). (vii) Unirrigated. (viii) 2 weedings, 4 thinnings and 4 to 6 wheel hoeings. (ix) 43.68". (x) 12.10.1954.

2. TREATMENTS:

8 times of application of 30 lb./ac. of N as A/S: $T_0$ = Control, $T_1$ = Before sowing, $T_2$ = Before sowing + § after 1st weeding, $T_3$ = $T_1$ before sowing + § after 1st weeding + § after 2nd weeding, $T_4$ = After 1st weeding, $T_5$ = After 2nd weeding, $T_6$ = $T_1$ before sowing + § after 2nd weeding and $T_7$ = $T_1$ after 1st weeding + § after 2nd weeding.

3. DESIGN:

(i) R.B.D. (ii) 8. (iii) 78' x 66'. (iv) 4. (v) 18' x 32'. (vi) 16' x 30'. (vii) 1' x 1'. (viii) Yes.

4. GENERAL:

(i) Fair. (ii) Dusting and spraying of DDT and other insecticides. (iii) Stand count, average height, green and dry fibre yield. (iv) (a) 1951-1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1674 lb./ac. (ii) 198.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb./ac.

Treatment: $T_0$ $T_1$ $T_2$ $T_3$ $T_4$ $T_5$ $T_6$ $T_7$

Av. yield 1543 1559 1671 1575 1813 1788 1739 1706

S.E./mean = 99.3 lb./ac.

Crop: Jute (Kharij).


Ref: J.A.R.I. 54(8).

Type: 'M'.

Object: To study the effect of different times of application of A/S on the yield of Jute fibre.

1. BASAL CONDITIONS:

(i) (a) Jute - Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 26.5.1954. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb./ac. (d) 12" x 3". (e) 1. (v) Nil. (vi) J.R.O.- 632 (medium). (vii) Unirrigated. (viii) 2 weedings, thinnings and 4 to 6 wheel hoeings. (ix) 41.68". (x) 13.10.1954.

2. TREATMENTS:

Same as in exp. no. 54(7) above.
5. RESULTS:

(i) 1493 lb./ac. (ii) 362.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
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<th>T₇</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1682</td>
<td>1430</td>
<td>1344</td>
<td>1478</td>
<td>1607</td>
<td>1345</td>
<td>1349</td>
<td>1712</td>
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<tr>
<td>S.E./mean</td>
<td>=</td>
<td>181.2 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Crop: Jute (Kharif).
Ref: J.A.R.I. 59(10).
Type: M'.

Object: To study the effect of different sources of N, P and K on the yield of Jute.

1. BASAL CONDITIONS:

(i) (a) to (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 30.5.1959. (iv) (a) Ploughing and laddering. (b) Line sowing. (c) 4 to 5 lb./ac. (d) 1’ between rows. (e) N.A. (v) Nil. (vi) J.R.O.-632. (vii) Unirrigated. (viii) Weeding and thinning. (ix) 3.10.1959.

2. TREATMENTS:

10 manurial treatments: M₀ = Control, M₁ = 30 lb./ac. of N as A/S, M₂ = 30 lb./ac. of N as A/S + 30 lb./ac. of P₂O₅ as Super, M₃ = M₂ + 30 lb./ac. of K₂O as Mur. Pot., M₄ = M₂ + 47.5 lb./ac. of K₂O as K₂O as Mur. Pot., M₅ = Complexes giving 30 lb./ac. each of N, K₂O and P₂O₅, M₆ = Nitrophoska blue giving 30 lb./ac. of N, P₂O₅ and 47.5 lb./ac. of K₂O, M₇ = Nitrophoska green giving 30 lb./ac. each of N, P₂O₅ and K₂O, and M₈ = M₇ + 17.5 lb./ac. of K₂O at Mur. Pot.

A/S applied in two instalments 3 to 4 weeks and 6 to 7 weeks after sowing. Other manures were applied at the time of sowing.

3. DESIGN:

(i) R.B.D. (ii) (a) 10. (b) 33' X 42'. (iii) 3. (iv) (a) 20' X 17'. (b) 18' X 15'. (v) 1' X 1'. (iv) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of fibre. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 2138 lb./ac. (ii) 182.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
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<tr>
<td>Av. yield</td>
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<td>2513</td>
<td>2176</td>
<td>2443</td>
<td>23.4</td>
<td>2044</td>
<td>2004</td>
<td>1879</td>
<td>2049</td>
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<tr>
<td>S.E./mean</td>
<td>=</td>
<td>105.6 lb./ac.</td>
<td></td>
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</table>

Crop: Jute (Kharif).
Ref: J.A.R.I. 59(11).
Type: M'.

Object: To study the effect of different sources of N, P and K on the yield of Jute.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 31.5.1959. (iv) (a) Ploughing and laddering. (b) Line sowing. (c) N.A. (d) 1’ between rows. (e) N.A. (f) Nil. (v) J.R.O.—632. (vii) Unirrigated. (viii) Weeding and thinning. (ix) 32.6°. (x) 6.10.1959.

2. TREATMENTS to 4. GENERAL:

Same as in exp. no. 59(10) above.
5. RESULTS:

(i) 2101 lb./ac. (ii) 249.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
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<td>1815</td>
<td>2246</td>
<td>2285</td>
<td>2197</td>
<td>2103</td>
<td>2151</td>
<td>2208</td>
<td>2023</td>
<td>2130</td>
<td>1834</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>143.8 lb./ac.</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop = Jute (Kharif).
Ref = J.A.R.I. 59(12).
Type = 'M'.

Object — To study the effect of N alone and in combinations with P and K on the yield of Jute.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 29.5.1959. (iv) (a) Ploughing and laddering. (b) Line sowing by drill. (c) 5 to 6 hrs./ac. (d) 1' between rows. (e) N.A. (v) 4000 lb./ac. of cowdung. (vi) J.R.C.—212. (vii) Unirrigated. (viii) Weeding and thinning. (ix) 82.6'. (x) 23.10.1959.

2. TREATMENTS:

12 manurial treatments: M₀ = Control, M₁ = 20 lb./ac. of N, M₂ = 40 lb./ac. of N, M₃ = 60 lb./ac. of N, M₄ = 80 lb./ac. of N, M₅ = 10 lb./ac. of N, M₆ = 160 lb./ac. of N, M₇ = 60 lb./ac. of P₂O₅, M₈ = 20 lb./ac. of P₂O₅, M₉ = 30 lb./ac. of P₂O₅, M₁₀ = 40 lb./ac. of P₂O₅, M₁₁ = 40 lb./ac. of K₂O, M₁₂ = 30 lb./ac. of K₂O, M₁₃ = 30 lb./ac. of K₂O.

3. DESIGN:

(i) R.B.D. (ii) 12. (b) 12' × 18'. (iii) 4. (iv) (a) 29.5' × 18'. (b) 27.5' × 16'. (v) 1' × 1'. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) N.A. (iii) Yield of jute fibre. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 2340 lb./ac. (ii) 170.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
<th>M₁₁</th>
<th>M₁₂</th>
<th>M₁₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1737</td>
<td>1992</td>
<td>2208</td>
<td>2241</td>
<td>2337</td>
<td>1988</td>
<td>1513</td>
<td>1954</td>
<td>2218</td>
<td>2166</td>
<td>2096</td>
<td>2029</td>
<td>1513</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>85.2 lb./ac.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Crop = Jute (Kharif).
Ref = J.A.R.I. 59(13).
Type = 'M'.

Object — To study the effect of N alone and in combinations with P and K on the yield of Jute.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 29.5.1959. (iv) (a) Ploughing and laddering. (b) Line sowing by drill. (c) 5 to 6 hrs./ac. (d) 1' between rows. (e) N.A. (i) 6000 lb./ac. of cowdung. (v) J.R.C.—432. (vi) Unirrigated. (vii) Weeding and thinning. (ix) 82.6'. (x) 2.10.1555.

2. TREATMENTS to 4. GENERAL:

Same as in exp. no. 59(12) above.
5. RESULTS:

(i) 2013 lb./ac. (ii) 207.4 lb./ac. (iii) Treatment differences i are not significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
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<tr>
<td>Av. yield</td>
<td>1806</td>
<td>1988</td>
<td>2172</td>
<td>2266</td>
<td>1961</td>
<td>2086</td>
<td>2195</td>
<td>2157</td>
<td>2149</td>
<td>1907</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>103.7 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Crop: Jute (Kharif). Site: Seed Multiplication Farm, Panagarh. Ref: J.A.R.I. 56(22). Type: 'M'.

Object: To study the effect of N, P, K and lime on the yield of Jute seed.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Panagarh. (iii) 11.7.1956. (iv) (a) Ploughing by tractor. (b) Broadcast. (c) 3.5 lb./ac. (d) 1' apart. (e) N.A. (f) Nil. (g) J.R.O.—632. (h) Unirrigated. (i) Weeding and thinning. (k) Middle of December, 1956.

2. TREATMENTS:

Main-plot treatments:
- 2 levels of lime:
  - Lo = 0
  - L₁ = 3 rnds./ac.

Sub-plot treatments:
- All combinations of (1), (2) and (3)
  - 2 levels of N as A/S: N₀ = 0 and N₁ = 40 lb./ac.
  - 2 levels of P₀ as Super: P₀ = 0 and P₁ = 40 lb./ac.
  - 2 levels of K₀ as Mul. Pot.: K₀ = 0 and K₁ = 40 lb./ac.

Lime applied 3 weeks before sowing. Super and Mul. Pot. applied before sowing and N as top-dressing.

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/replication; 8 sub-plots/main-plot. (b) 8' x 106'. (iii) 4. (iv) (a) 20' x 25'. (b) 18' x 21'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Nil. (iii) Yield of jute seed. (iv) (a) 1956—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 217 lb./ac. (ii) 52.0 lb./ac. (b) 83.9 lb./ac. (iii) Main effects of N and P are highly significant and interaction N x P is significant. (iv) Av. yield of jute seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₀</th>
<th>L₁</th>
<th>N₀</th>
<th>N₁</th>
<th>P₀</th>
<th>P₁</th>
<th>Mean</th>
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<tbody>
<tr>
<td>K₀</td>
<td>191</td>
<td>215</td>
<td>149</td>
<td>257</td>
<td>159</td>
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<td>K₁</td>
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<td>179</td>
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<td>Mean</td>
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<td>223</td>
<td>164</td>
<td>269</td>
<td>174</td>
<td>260</td>
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<td>262</td>
<td>181</td>
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<td>N₀</td>
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<td>N₁</td>
<td>259</td>
<td>287</td>
<td>162</td>
<td>281</td>
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<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. L marginal means = 13.0 lb./ac.
2. N, P or K marginal means = 21.0 lb./ac.
3. N, P or K means at the same level of L = 29.7 lb./ac.
4. L means at the same level of N, P or K = 24.7 lb./ac.
S.E. of body of N x P, N x K or P x K table = 21.0 lb./ac.
Crop: Jute (Kharif).
Site: Seed Multiplication Farm, Panagarh.

Object: To study the effect of N, P, K and lime on the yield of Jute seed.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.   (ii) Sandy loam.   (b) Refer soil analysis, Panagarh.   (iii) 30.6.1956.   (iv) (a) Ploughing and laddering.   (b) Broadcast.   (c) 10 lb./ac.   (d) 1' apart.   (e) N.A.   (v) Nil.   (vi) J.R.C.—212.   (vii) Unirrigated.   (viii) Weeding and thinning.   (ix) 45.26°.   (x) 12.12.1958.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 56(22) on page 242.

3. Lime applied 3 to 7 days before sowing. Super and Mur. Pot. applied at the time of sowing.

4. RESULTS:
   (i) 482 lb./ac.   (ii) 199.4 lb./ac.   (b) 68.0 lb./ac.   (iii) Main effects of N and P and interaction N×P are highly significant.   (iv) Av. yield of jute seed in lb./ac.

5. Table:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N0</th>
<th>N1</th>
<th>P0</th>
<th>P1</th>
<th>Mean</th>
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<td>K0</td>
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<td>496</td>
<td>397</td>
<td>552</td>
<td>474</td>
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<td>503</td>
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<td></td>
</tr>
<tr>
<td>Mean</td>
<td>524</td>
<td>573</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. L marginal means = 24.8 lb./ac.
2. N, P or K marginal means = 17.0 lb./ac.
3. N, P or K means at the same level of L = 24.0 lb./ac.
4. L means at the same level of N, P or K = 36.8 lb./ac.
S.E. of body of N×P, N×K or P×K table = 17.0 lb./ac.
<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N</th>
<th>P₀</th>
<th>P₁</th>
<th>K₀</th>
<th>K₁</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>L₀</td>
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<td>447</td>
<td>329</td>
<td>470</td>
<td>387</td>
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<td>400</td>
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<tr>
<td>L₁</td>
<td>372</td>
<td>441</td>
<td>321</td>
<td>492</td>
<td>418</td>
<td>395</td>
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<td>362</td>
<td>444</td>
<td>325</td>
<td>481</td>
<td>402</td>
<td>404</td>
<td>403</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. L marginal means = 11.8 lb./ac.
2. N, P or K marginal means = 15.4 lb./ac.
3. N, P or K means at the same level of L = 21.7 lb./ac.
4. L mean at the same level of N, P or K = 19.4 lb./ac.
S.E. of the body of N×P, N×K or P×K table = 15.4 lb./ac.

---

**Crop:** Jute *(Kharij)*  
**Site:** Seed Multiplication Farm, Panagarh  
**Ref:** J.A.R.I. 57(14)  
**Type:** 'M'

**Object:** To study the effect of N, P, K and lime on the yield of Jute seed.

### 1. BASAL CONDITIONS:

- (i) (a) to (c) N.A.  
- (ii) (a) Sandy loam. (b) Refer soil analysis, Panagarh.  
- (iii) 12.7.1957.  
- (iv) (a) Ploughing and laddering. (b) Broadcast. (c) 3 to 4 lb/ac. (d) 1' apart. (e) N.A.  

### 2. TREATMENTS:

- 9 manurial treatments: T₀ = Control, T₁ = 30 lb/ac. of N, T₂ = 30 lb/ac. of N+10 lb/ac. of P₂O₅, T₃ = 30 lb/ac. of N+10 lb/ac. of K₂O, T₄ = 30 lb/ac. of N+10 lb/ac. of K₂O+40 lb/ac. of P₂O₅, T₅ = T₁+3 mds./ac. of lime, T₆ = T₁+3 mds./ac. of lime, T₇ = T₃+3 mds./ac. of lime and T₈ = T₄+3 mds./ac. of lime.

### 3. DESIGN:

- (i) R.B.D. (ii) (a) 9, (b) 52'× 38'. (iii) 3. (iv) (a) 15'× 7'. (b) 13'× 5'. (v) 1'× 1'. (vi) Yes.

### 4. GENERAL:

- (i) Good. (ii) N.A. (iii) Yield of jute seed. (iv) (a) 1956—1958. (b) No. (c) N il. (v) to (vii) Nil.

### 5. RESULTS:

- (i) 619 lb/ac. (ii) 101.1 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of jute seed in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>729</td>
<td>599</td>
<td>602</td>
<td>679</td>
<td>626</td>
<td>582</td>
<td>597</td>
<td>683</td>
<td>567</td>
</tr>
</tbody>
</table>

S.E./mean = 38.5 lb./ac.
**Crop:** Jute (Kharif)

**Ref:** J.A.R.I. 57(15).

**Type:** ‘MV’

**Object:** To study the effect of N, P, K and lime on the yield of Jute seed.

### 1. **Basal Conditions:**
- (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Panagarh. (iii) 10.7.1957. (iv) (a) Ploughing and laddering. (b) Broadcast. (c) N.A. (d) 1’ apart. (e) N.A. (f) Nil. (g) J.R.O.—632. (h) Unirrigated. (viii) Weeding and thinning. (ix) 48.33°. (x) 15.11.1957.

### 2. **Treatments:**
Same as in exp. no. 57(14) on page 244.

### 3. **Design:**
- (i) R.B.D.
- (ii) 9. (b) 55’ x 34’. (iii) 3. (iv) (a) 17’ x 10’. (b) 15’ x 8’. (v) 1’ x 1’. (vi) Yes.

### 4. **General:**
- (i) Good. (ii) N.A. (iii) Yield of Jute seed. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) to (vii) Nil.

### 5. **Results:**
- (i) 590 lb./ac. (ii) 86.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of Jute seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T6</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>345</td>
<td>560</td>
<td>588</td>
<td>670</td>
<td>618</td>
<td>553</td>
<td>648</td>
<td>563</td>
<td>562</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>50.1 lb./ac.</td>
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</tbody>
</table>

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**Crop:** Jute (Kharif)

**Ref:** J.A.R.I. 54(13).

**Type:** ‘MV’

**Object:** To study the effect of N through different sources on different varieties of Jute.

### 1. **Basal Conditions:**
- (i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 23.5.1954. (iv) (a) 4 to 5 ploughings and laddering. (b) Drilling. (c) 5 lb./ac. (d) 12” x 3’. (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings, 2 thinnings and 4 to 6 wheel hoeings. (ix) 43.6°. (x) 8 and 9.10.1954.

### 2. **Treatments:**
- Main-plot treatments:
  - 2 varieties: V1 = J.R.C.—212 (medium) and V2 = J.R.O.—622 (medium).
- Sub-plot treatments:
  - 9 sources of 30 lb./ac. of N: S0 = Control, S1 = Parle’s mixture, S2 = Talukdar’s mixture, S3 = A/S, S4 = Sodium Nitrate, S5 = Potassium Nitrate, S6 = Urea, S7 = A/S/N and S8 = C/N.

### 3. **Design:**
- (i) Split-plot. (ii) (a) 2 main-plots/block; 9 sub-plots/main-plot. (b) 179’ x 76’. (iii) 4. (iv) (a) 28’ x 24’. (b) 25’ x 21’. (v) 1.5’ x 1.5’. (vi) Yes.

### 4. **General:**
- (i) Good. (ii) Nil. (iii) Green plant and dry fibre yield, stand count and average height. (iv) (a) 1954—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

### 5. **Results:**
- (i) 222 lb./ac. (ii) (a) 511.4 lb./ac. (b) 231.5 lb./ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of dry fibre in lb./ac.
Crop :- Jute (Kharif).


Ref :- J.A.R.I. 55(13).

Type :- 'MV'.

Object :- To study the effect of N through different sources on different varieties of Jute.

1. BASAL CONDITIONS:
   (i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Ref. soil analysis, Nilganj. (iii) 5.6.1955. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb./ac. (d) 12" x 3". (e) 1. (v) Nil. (vii) As per treatments. (viii) Unirrigated. (ix) 2 weedings, 4 thinnings and 4 to 6 wheel hoeings. (x) 12.18.1956.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties: \( V_1 = J.R.C.-212 \) (medium) and \( V_2 = J.R.O.-632 \) (medium).

   Sub-plot treatments:
   9 sources of 30 lb./ac. of N: \( S_0 = \) Control, \( S_1 = \) Paul’s mixture, \( S_2 = \) Talukdar’s mixture, \( S_3 = A/S, S_4 = \) Sodium Nitrate, \( S_5 = \) Potassium Nitrate, \( S_6 = \) Urea, \( S_7 = A/S/N \) and \( S_8 = C/N. \)

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block; 9 sub-plots/main-plot. (b) 20′ x 67′. (iii) 4. (iv) (a) 21′ x 32′. (b) 1′ x 2′. (v) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Nil. (iv) Green plant and dry fibre yield, stand count and average height. (v) 1954—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1716 lb./ac (ii) 29.6 lb./ac. (b) 21.6 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of jute seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_0 )</th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( S_4 )</th>
<th>( S_5 )</th>
<th>( S_6 )</th>
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<td>1800</td>
<td>1817</td>
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<td>1667</td>
<td>1724</td>
<td>1733</td>
<td>1716</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means
2. S marginal means
3. S means at the same level of V
4. V means at the same level of S

= 120.5 lb/ac.
= 116.8 lb/ac.
= 165.1 lb/ac.
= 170.8 lb/ac.
Object:—To study the effect of N through different sources on different varieties of Jute.

1. BASAL CONDITIONS:
(i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 8.6.1957. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb./ac. (d) 12"x3". (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings, 2 thinnings and 4 to 6 weedings. (ix) N.A.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 55(13) on page 246.

5. RESULTS:
(i) 1361 lb./ac. (ii) (a) 606.5 lb./ac. (b) 258.1 lb./ac. (iii) Main effect of V alone is significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
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<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
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S.E. of difference of two
1. V marginal means
2. S marginal means
3. S means at the same level of V
4. V means at the same level of S

Crop :- Jute (Kharif).
Ref :- J.A.R.I. 57(8).
Type :- 'MV'.

Object:—To study the effect of N through different sources on different varieties of Jute.

1. BASAL CONDITIONS:
(i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 8.6.1957. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb./ac. (d) 12"x3". (e) 1. (v) NIL. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings, 2 thinnings and 4 to 6 weedings. (ix) N.A.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 55(13) on page 246.

5. RESULTS:
(i) 1431 lb./ac. (ii) (a) 53.9 lb./ac. (b) 18.8 lb./ac. (iii) Main effect of Salone is highly significant. (iv) Av. yield of dry fibre in lb./ac.
<table>
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<tr>
<th></th>
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<th>S₂</th>
<th>S₃</th>
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<th>S₅</th>
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S.E. of difference of two
1. V marginal means
2. S marginal means
3. S means at the same level of V
4. V means at the same level of S

---

**Crop:** Jute (Kharif)

**Site:** Jute Agri. Res. Instt., Nilganj.

**Object:** To study the effect of N through different sources on different varieties of Jute.

**1. BASAL CONDITIONS:**
(i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 1.5 1958. (iv) (a) 4 to 5 ploughings and laddering. (b) Drilling. (c) 5 lb./ac. (d) 12½ × 3”. (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings, 2 thinnings and 4 to 6 weedings. (ix) 35.71". (x) 24 and 25.9.1958.

**2. TREATMENTS to 4. GENERAL:**
Same as in expt. no. 55(13) on page 246.

**3. RESULTS:**
(i) 2034 lb./ac. (ii) (a) 52.9 lb./ac. (b) 23.4 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>S₂</th>
<th>S₃</th>
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<td>2219</td>
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<td>2183</td>
<td>1999</td>
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S.E. of difference of two
1. V marginal means
2. S marginal means
3. S means at the same level of V
4. V means at the same level of S

---

**Crop:** Jute (Kharif)

**Site:** Jute Agri. Res. Instt., Nilganj.

**Object:** To study the effect of different levels of N on different varieties of Jute.

**1. BASAL CONDITIONS:**
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 29.5.1956. (iv) (a) Ploughing and laddering. (b) Line sowing by drill. (c) 3 to 4 lb./ac. (d) Rows 1’ apart. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and thinning. (ix) 69.29". (x) 10.9.1956.
2. TREATMENTS:

Treatments in one direction:
4 varieties: \(V_1 = J.R.O.-612, V_2 = J.R.O.-620, V_3 = C.G.\) and \(V_4 = \text{Local}\) (olii).

Treatments in orthogonal direction:
4 levels of \(N\) as A/S: \(N_0 = 0, N_1 = 20, N_2 = 40\) and \(N_3 = 60 \text{ lb./ac.}\).

3. DESIGN:

(i) Strip-plot. (ii) (a) 4 strips in one direction and 4 in orthogonal direction. (b) 20' x 33'. (c) 16' x 19'. (v) 2' x 2'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) N.A. (iii) Yield of fibre. (iv) (a) 1956-1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 153 lb./ac. (ii) S.E. \((V) = 215.6 \text{ lb./ac.}, S.E. (N) = 115.3 \text{ lb./ac.}, S.E. (V \times N) = 125.9 \text{ lb./ac.}\) (iii) Main effects of \(N\) and \(V\) are highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>(N)</th>
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<th>(V_3)</th>
<th>Mean</th>
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<td>(N_2)</td>
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<td>Mean</td>
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<td>1685</td>
<td>1759</td>
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</table>

S.E. of difference of two
1. \(V\) marginal means = 76.2 lb./ac.
2. \(N\) marginal means = 55.0 lb./ac.
3. \(N\) means at the same level of \(V\) = 84.7 lb./ac.
4. \(V\) means at the same level of \(N\) = 108.4 lb./ac.

Crop = Jute (Kharif).
Ref = J.A.R.I. 57(12).
Type = 'MV'.

Object = To study the effect of different levels of \(N\) on different varieties of Jute.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 2.6.1957. (iv) (a) 5 to 6 ploughings and laddering. (b) Line sowing by drill. (c) 3 to 4 lb./ac. (d) Rows 1' apart. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings and thinning. (ix) 48.33'. (x) 25.9.1957.

2. TREATMENTS to 4. GENERAL:

Same as in exp't no. 56(24) on page 248.

5. RESULTS:

(i) 796 lb./ac. (ii) S.E. \((V) = 261.0 \text{ lb./ac.}, S.E. (N) = 147.4 \text{ lb./ac.}, S.E. (V \times N) = 181.2 \text{ lb./ac.}\) (iii) Main effects of \(N\) and \(V\) are highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>(N)</th>
<th>(V_1)</th>
<th>(V_2)</th>
<th>(V_3)</th>
<th>Mean</th>
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<td>(N_2)</td>
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<td>592</td>
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<td>984</td>
<td>713</td>
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</table>
Object: To study the effect of different levels of N on different varieties of Jute.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 4.6.1958. (iv) (a) Ploughing and laddering. (b) Line sowing by drill. (c) 3 to 4 lb./ac. (d) Rows 1' apart. (a) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and thinning. (ix) 45.26°. (x) 11.9.1958 to 4.10.1958.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 56(24) on page 248.

5. RESULTS:
   (i) 1714 lb./ac. (ii) S.E. (V) = 252.9 lb./ac., S.E. (N) = 68.8 lb./ac., S.E. (N x V) = 87.3 lb./ac. (iii) Main effects of V and N are highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
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<th></th>
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<th>N₂</th>
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S.E. of difference of two
1. V marginal means
2. N marginal means
3. V means at the same level of N
4. N means at the same level of V

Crop: Jute (Kharif)


Object: To study the effect of different levels of N on different varieties of Jute.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 29.5.1959. (iv) (a) Ploughing and laddering. (b) Drilling. (c) 3 to 4 lb./ac. (d) Rows 1' apart. (a) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and thinning. (ix) 82.6°. (x) 29.9.1959.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 56(24) on page 248.

5. RESULTS:
   (i) 1714 lb./ac. (ii) S.E. (V) = 129.6 lb./ac., S.E. (N) = 125.8 lb./ac. S.E. (N x V) = 184.9 lb./ac. (iii) Main effects of V and N are highly significant. (iv) Av. yield of dry fibre in lb./ac.
Site: Jute Agri. Res. Inst., Nilganj. Type: 'MV'.

Object: To study the effect of different levels of N on different varieties of Jute.

1. BASAL CONDITIONS:
   (i) Jute—Mustard. (b) Mustard. (c) Nil. (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 29.5.1955. (iv) 4 to 5 ploughings and laddering. (b) Drilling. (c) 5 lb./ac. (d) 12" x 3". (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weeding and 2 thinning. (ix) 10.10.1955 for V1, V2, V4 and 16.9.1954 for V3.

2. TREATMENTS:
   Treatments in one direction:
   Treatments in orthogonal direction:
   4 levels of N as A's: N0 = 0, N1 = 20, N2 = 40 and N3 = 60 lb./ac.

3. DESIGN:
   (i) Strip-plot. (ii) 4 strips in one direction and 4 strips in orthogonal direction. (b) 86' x 138'. (iii) 4. (iv) 20' x 33'. (v) 16' x 29'. (vi) 2' x 2'. (vii) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Stand count, average height, green and dry fibre yield. (iv) 1955—1959. (b) Yes. (v) Nil. (vi) to (vii) Nil.

5. RESULTS:
   (i) 1608 lb./ac. (ii) N.A. (iii) None of the effects is significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
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<tr>
<td>Mean</td>
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S.E.A = N.A.
Crop: Jute (Kharif).
Ref: J.A.R.I. 56(14).
Type: 'MV'.

Object: To study the effect of different levels of N on different varieties of Jute.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 28.5.1956. (iv) (a) 5 to 6 ploughings and 2 laddergins. (b) Line sowing by drill. (c) 5 to 6 lb./ac. (d) 12'x3'. (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 to 3 weedings and thinnings. (ix) 69.29'. (x) 5.9.1956 to 16.10.1956.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 55(14) on page 251.

5. RESULTS:
   (i) 1157 lb./ac. (ii) S.E. (V) 70.7 lb./ac., S.E. (N) = 233.7 lb./ac., S.E. (VXN) = 165.4 lb./ac. (iii) Main effects of N and V are highly significant. Interaction NXV is significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>N1</th>
<th>N2</th>
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<th>Mean</th>
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</table>

S.E. of difference of two
1. V marginal means
2. N marginal means
3. V means at the same level of N
4. N means at the same level of V

Crop: Jute (Kharif).
Ref: J.A.R.I. 57(11).
Type: 'MV'.

Object: To study the effect of different levels of N on different varieties of Jute.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 3.6.1957. (iv) (a) Ploughing and laddering. (b) Line sowing by drill. (c) 5 to 6 lb./ac. (d) 12'x3'. (e) 1. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings and 2 thinnings. (ix) 48.33'. (x) V4 and V4 on 14.10.1957 and V3 and V0 on 21.10.1957.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 55(14) on page 251.

5. RESULTS:
   (i) 766 lb./ac. (ii) S.E. (V) = 537.9 lb./ac., S.E. (N) = 233.8 lb./ac., S.E. (VXN) = 207.5 lb./ac. (iii) Main effect of N is highly significant. Main effect of V is significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>N1</th>
<th>N2</th>
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</table>
Object: —To study the effect of different levels of \( N \) on different varieties of Jute.

1. BASAL CONDITIONS:
(i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 5.5.1958.
(iv) (a) 4 to 5 ploughings and laddering. (b) Drilling. (c) 5 lb./ac. (d) 12"x3". (e) I. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings and 2 thinnings. (a) 35.71°. (x) 3.9.1958 to 26.9.1958.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 55(14) on page 251.

5. RESULTS:
(i) 1892 lb./ac. iii) S.E. (V)=435.6 lb./ac., S.E. (N)=254.9 lb./ac. S.E. (VxN)=138.0 lb./ac. (iii) Main effect of \( V \) is significant and main effect of \( N \) is highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>( V_4 )</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>1805</td>
<td>1571</td>
<td>1681</td>
<td>1870</td>
<td>1732</td>
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<td>1950</td>
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<td>2115</td>
<td>1878</td>
<td>1989</td>
<td>2244</td>
<td>2055</td>
</tr>
<tr>
<td>Mean</td>
<td>1892</td>
<td>1743</td>
<td>1832</td>
<td>2037</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 92.6 lb./ac.
2. N marginal means = 56.6 lb./ac.
3. N means at the same level of \( V \) = 92.6 lb./ac.
4. V means at the same level of \( N \) = 121.0 lb./ac.

Object: —To study the effect of different levels of \( N \) on different varieties of Jute.

1. BASAL CONDITIONS:
(i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 24.5.1959.
(iv) (a) Ploughing, spading and laddering. (b) Drilling. (c) 5 to 6 lb./ac. (d) 12"x3". (e) I. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and thinning. (a) 84.72°. (x) 7.9.1959 to 7.10.1959.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 55(14) on page 251.

5. RESULTS:
(i) 1274 lb./ac. iii) S.E. (V)=435.6 lb./ac., S.E. (N)=254.9 lb./ac. S.E. (VxN)=138.0 lb./ac. (iii) Main effect of \( V \) is significant and main effect of \( N \) is highly significant. (iv) Av. yield of dry fibre in lb./ac.
Crop: Jute *(Kharif).*


Object: To study the effect of different spacings in plants grown in single and double rows for Jute.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.
   (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 27.5.1956. (iv) (a) Ploughings. (b) Line sowing by drill. (c) N.A. (d) As per treatments. (e) N.A. (v) 0.55 lb./plot of A/B. (vi) J.R.C.—212. (vii) Unirrigated. (viii) Weeding and thinning. (ix) 69.29'. (x) 5.10.1956.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 2 arrangements of rows: M₁ = Single row and M₂ = Double row.
   (2) 3 spacings between rows: R₁ = 12", R₂ = 16" and R₃ = 20".
   (3) 3 spacings between plants: S₁ = 1", S₂ = 3" and S₃ = 5".

4th spacing kept between the double rows in case of M₂.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 18. (b) 82'×64'. (iii) 3. (iv) (a) 14'×22'. (b) 12'×20'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of jute fibre. (iv) (a) 1956—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2172 lb./ac. (ii) 343.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>Mean</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
</tr>
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<td>M₁</td>
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<td>2220</td>
<td>2003</td>
<td>2213</td>
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<td>2055</td>
<td>2157</td>
<td>2180</td>
<td>2130</td>
<td>1987</td>
<td>2282</td>
</tr>
<tr>
<td>Mean</td>
<td>2235</td>
<td>2188</td>
<td>2092</td>
<td>2172</td>
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<td>S₂</td>
<td>2241</td>
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<td>2272</td>
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<td>S₃</td>
<td>2273</td>
<td>1988</td>
<td>1993</td>
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</table>

S.E. of difference of two
1. V marginal means = 154.0 lb./ac.
2. N marginal means = 90.1 lb./ac.
3. V means at the same level of N = 175.6 lb./ac.
4. N means at the same level of V = 123.5 lb./ac.
Crop :- Jute (Kharif).

Ref :- J.A.R.I. 57(21).
Type :- 'C'.

Object :- To study the effect of different spacings in plants grown in single and double rows for Jute.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) (a) Sandy loam.  (b) Refer soil analysis, Nilganj.  (iii) 11.6.1957.  (iv) (a) 4 to 5 ploughings.  (b) Line sowing by drill.  (c) N.A.  (d) As per treatments.  (e) N.A.  (v) N.A.  (vi) J.R.C.—212.  (vii) Unirrigated.  (viii) Weeding and thinning.  (ix) 48.33'.  (x) 18.10.1957.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 56(26) on page 254.

5. RESULTS :
   (i) 1848 lb./ac.  (ii) 307.8 lb./ac.  (iii) Only main effect of R is highly significant.  (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>Mean</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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<tr>
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<td>2136</td>
<td>1948</td>
<td>1652</td>
<td>1912</td>
<td>1819</td>
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<tr>
<td>S₃</td>
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<td>1718</td>
<td>1478</td>
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</tbody>
</table>

S.E. of M marginal mean = 73.9 lb./ac.
S.E. of R or S marginal mean = 90.5 lb./ac.
S.E. of body of M x R or M x S table = 127.9 lb./ac.
S.E. of body of R x S table = 156.7 lb./ac.

Crop :- Jute (Kharif).

Ref :- J.A.R.I. 58(17).
Type :- 'C'.

Object :- To study the effect of different spacings in plants grown in single and double rows for Jute.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) (a) Sandy loam.  (b) Refer soil analysis, Nilganj.  (iii) 11.6.1958.  (iv) (a) Ploughing.  (b) Line sowing by drill.  (c) N.A.  (d) As per treatments.  (e) N.A.  (v) N.A.  (vi) J.R.C.—212.  (vii) Unirrigated.  (viii) Weeding and thinning.  (ix) 45.26'.  (x) 6.10.1958.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 56(26) on page 254.

3. RESULTS :
   (i) 1848 lb./ac.  (ii) 351.6 lb./ac.  (iii) Main effect of S alone is highly significant.  (iv) Av. yield of fibre in lb./ac.
### BASAL CONDITIONS:

(i) (a) to (c) N.A.  (ii) (a) Sandy loam. (b)Refer soil analysis, Nilganj.  (iii) 27.5.1956. (iv) (a) 4 to 5 ploughings. (b) Line sowing by drill. (c) N.A.  (d) As per treatments.  (e) N.A.  (v) 78 lb./ac. of A/S.  

### TREATMENTS to 4. GENERAL:

Same as in exp. no. 56(26) on page 254.

### RESULTS:

(i) 2507 lb./ac.  (ii) 211.9 lb./ac.  (iii) Only main effect of B is highly significant.  (iv) Av. yield of fibres in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
</tr>
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<td>2635</td>
<td>2545</td>
<td>2377</td>
<td>2519</td>
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<td>M2</td>
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<td>2629</td>
<td>2301</td>
<td>2456</td>
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<td>2339</td>
<td>2507</td>
<td>2506</td>
<td>2506</td>
<td>2451</td>
</tr>
</tbody>
</table>

S.E. of M marginal mean = 40.8 lb./ac.  
S.E. of R or S marginal mean = 49.9 lb./ac.  
S.E. of body of M X R or M X S table = 70.4 lb./ac.  
S.E. of body of R X S table = 85.1 lb./ac.
Object: To study the effect of different spacings between plants grown in single and double rows for Jute.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 12.6.1957.  (iv) (a) 4 to 5 ploughings. (b) Line sowing by drill. (c) N.A. (d) As per treatments. (e) N.A. (v) N.I. (vi) J.R.O.—632. (vii) Unirrigated. (viii) Weeding and thinning. (ix) 43.35°. (x) 27.9.1957.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 56(26) on page 254.

5. RESULTS:
   (i) 1397 lb./ac. (ii) 186.4 lb./ac. (iii) Main effect of S is highly significant and interaction M X S is significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R_1</th>
<th>R_2</th>
<th>R_3</th>
<th>Mean</th>
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<th>S_2</th>
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<tr>
<td>S_2</td>
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<td>1477</td>
<td>1325</td>
<td></td>
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<td></td>
</tr>
<tr>
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<td>1200</td>
<td>1211</td>
<td></td>
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</tr>
</tbody>
</table>

S.E. of M marginal mean = 35.9 lb./ac.  
S.E. of R or S marginal mean = 43.6 lb./ac.  
S.E. of body of M X R or M X S table = 62.1 lb./ac.  
S.E. of body of R X S table = 76.1 lb./ac.
Crop : Jute (Kharij).
Object : To study the effect of growing Jute in rows.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Jute. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 3.6.1955. (iv) (a) 4 to 5 ploughings and laddering. (b) As per treatments. (c) 5 lb./ac. (d) As per treatments. (e) 1. (v) N.A. (vi) D = 154. (vii) Unirrigated. (viii) 2 weedings and thinning. (ix) N.A. (x) 4.10.1955.

2. TREATMENTS:
5 methods of sowing : M₁ = Broadcast, M₂ = Line sowing and light thinning to 12" spacing, M₃ = Line sowing at 2" x 12" spacing, M₄ = Line sowing at 3" x 12" spacing and M₅ = Gradual hand thinning to 3" x 12" spacing.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) 85' x 50'. (iii) 4. (iv) (a) 50' x 16'. (b) 48' x 14'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Green plant and dry fibre yield, stand count and height. (iv) (a) 1951—1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 177 lb./ac. (ii) 146.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1510</td>
<td>1760</td>
<td>1805</td>
<td>1896</td>
<td>1863</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>73.0 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ref : J.A.R.I. 55(15).
Type : 'C'.
1. BASAL CONDITIONS:

(i) (a) Jute-Jute. (b) Jute. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 4.6.1955. (iv) (a) to 5 ploughings and ladderings. (b) As per treatments. (c) 5 lb./ac. (d) As per treatments. (e) 1. (v) N.A. (vi) C-G. (vii) Unirrigated. (viii) 2 weedings and 2 thinnings. (ix) N.A. (x) 16.9.1955.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 55(15) on page 258.

5. RESULTS:

(i) 142 lb./ac. (ii) 73.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
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<tbody>
<tr>
<td>Av. yield</td>
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<td>1540</td>
<td>1346</td>
<td>1427</td>
<td>1473</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>36.8 lb./ac.</td>
<td></td>
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</tbody>
</table>

Crop :- Jute (Kharif).
Ref :- J.A.R.I. 58(16).
Type :- 'C'.

Object :- To study the effect of post-sowing cultural operations on the yield of Jute fibre.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 29.4.1958. (iv) (a) Ploughing and ladderings. (b) Line sowing. (c) N.A. (d) Rows 1' apart. (e) N.A. (v) N.A. (vi) J.R.O. 632. (vii) Unirrigated. (viii) As per treatments. (ix) 8.10.1958.

2. TREATMENTS:

12 cultural treatments: T₁ = 1 weeding+2 thinnings+2 wheel hoeings, T₂ = 1 weeding+2 thinnings+4 wheel hoeings, T₃ = 2 weedings+2 thinnings+2 wheel hoeings, T₄ = 2 weedings+2 thinnings+4 wheel hoeings, T₅ = 2 weedings+2 thinnings+6 wheel hoeings, T₆ = 2 weedings+2 thinnings+6 wheel hoeings, T₇ = 2 weedings+2 thinnings+6 wheel hoeings, T₈ = 2 weedings+2 thinnings+6 wheel hoeings, T₉ = 2 weedings+2 thinnings+6 wheel hoeings, T₁₀ = 2 weedings+2 thinnings+6 wheel hoeings, T₁₁ = 2 weedings+2 thinnings+6 wheel hoeings, T₁₂ = 2 weedings+2 thinnings+6 wheel hoeings.

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) 82' x 70'. (iii) 4. (iv) (a) 26' x 16'. (b) 24' x 14'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) N.A. (iii) Yield of fibre. (iv) (a) 1958—cond. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 378 lb./ac. (ii) 61.9 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
<th>T₁₀</th>
<th>T₁₁</th>
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<td>371</td>
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<td>389</td>
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<td>509</td>
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<tr>
<td>S.E./mean</td>
<td>30.9 lb./ac.</td>
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</tr>
</tbody>
</table>

Crop :- Jute (Kharif).
Ref :- J.A.R.I. 59(15).
Type :- 'C'.

Object :- To study the effect of post-sowing cultural operations on the yield of Jute fibre.
1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (b) Refer soil analysis, Nilganj. (c) 16.5.1956. (iv) (a) Ploughing and laddering. (b) Line sowing. (c) 3 to 4 srs./ac. (d) Rows 1' apart. (e) N.A. (v) J.R.O.—632. (vi) Unirrigated. (vii) As per treatments. (viii) 69.29'. (ix) 28.8.1956.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 58(16) on page 259.

3. DESIGN:
(i) R.B.D. (ii) (a) 14. (b) 110'×74'. (iii) 3. (iv) (a) 36'×14'. (b) 34'×12'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Yield of fibre. (iv) (a) 1956—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1326 lb./ac. (ii) 793.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
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<th>T3</th>
<th>T4</th>
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<th>T10</th>
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<table>
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<tbody>
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<td>1172</td>
<td>795</td>
<td>810</td>
<td>918</td>
<td>1046</td>
<td>844</td>
<td>1682</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 457.9 lb./ac.
Crop :- Jute (Kharif).


Ref :- J.A.R.I. 57(18).

Type :- 'C'.

Object :- To study the effect of different post-sowing cultural operations on the yield of Jute fibre.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.  (iii) 2.6.1927. (iv) (a) Ploughing and laddering. (b) Line sowing. (c) 3 to 4 hrs./ac.  (d) Rows 1' apart.  (e) N.A.  (f) N.A.  (g) J.R.O.-632 (early). (h) Unirrigated.  (i) 27.9.1957.

2. TREATMENTS to 4. GENERAL :
   Same as in exp. no. 56(23) on page 260.

3. RESULTS :
   (i) 798 lb./ac. (ii) 364.7 lb./ac. (iii) Treatment differences are highly significant.  (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>942</td>
<td>998</td>
<td>945</td>
<td>1121</td>
<td>1429</td>
<td>1368</td>
<td>442</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>618</td>
<td>400</td>
<td>665</td>
<td>471</td>
<td>294</td>
<td>424</td>
<td>983</td>
</tr>
</tbody>
</table>

S.E./mean = 210.6 lb./ac.

Crop :- Jute (Kharif).


Ref :- J.A.R.I. 56(20).

Type :- 'C'.

Object :- To find out the optimum time of thinning for Jute fibre.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj.  (iii) 23.6.1956. (iv) (a) Ploughing and laddering. (b) Line sowing. (c) N.A.  (d) Rews 1' apart.  (e) N.A.  (f) N.A.  (g) J.R.C. 212.  (h) Unirrigated.  (i) Weeding and thinning as per treatments.  (k) 18.10.1956.

2. TREATMENTS :
   8 stages of thinning : T1=1, T2=2, T3=3, T4=4, T5=5, T6=6, T7=7 and T8=8 weeks after sowing.

3. DESIGN :
   (i) R.B.D.  (ii) (a) 36. (b) 62' x42'. (iii) 3.  (iv) (a) 20' x14'. (b) 18' x17'.  (v) 1' x1'.  (vi) Yes.

4. GENERAL :
   (i) Good.  (ii) N.A.  (iii) Yield of fibre.  (iv) (a) 1956-1958.  (b) Yes.  (c) Nil.  (v) to (vi) Nil.

5. RESULTS :
   (i) 984 lb./ac. (ii) 306.8 lb./ac. (iii) Treatment differences are not significant.  (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>13.4</td>
<td>13.5</td>
<td>12.6</td>
<td>7.72</td>
<td>8.73</td>
<td>7.32</td>
<td>9.44</td>
</tr>
</tbody>
</table>

S.E./mean = 177.1 lb./ac.

Crop :- Jute (Kharif).


Ref :- J.A.R.I. 57(16).

Type :- 'C'.

Object :- To find out the optimum time of thinning for Jute fibre.
## 1. BASAL CONDITIONS:

(i) (a) to (c) N.A.  (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 3.6.1957.  (iv) (a) Ploughing and laddering. (b) Line sowing. (c) N.A. (d) (e) N.A. (f) N.A. (g) N.A. (h) J.R.C.—212.  (vii) Unirrigated. (viii) Weeding and thinning as per treatments.  (ix) 48.33°.  (x) 16.10.1957.

## 2. TREATMENTS to 4. GENERAL:

Same as in exp. no. 56(20) on page 261.

## 5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1530</td>
<td>1294</td>
<td>1627</td>
<td>1533</td>
<td>1249</td>
<td>1212</td>
<td>1268</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>219.0 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Crop: Jute (Kharif).  
Object: To find out the optimum time of thinning for Jute fibre.

Ref: J.A.R.I. 58(10).  
Type = 'C'.

## 1. BASAL CONDITIONS:

(i) (a) to (c) N.A.  (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 28.4.1958.  (iv) (a) Ploughing and laddering. (b) Line sowing. (c) to (e) N.A. (f) N.A. (g) J.R.C. 212.  (vii) Unirrigated. (viii) Weeding and thinning as per treatments.  (ix) 45.20°.  (x) 3.10.1958.

## 2. TREATMENTS to 4. GENERAL:

Same as in exp. no. 56(20) on page 261.

## 5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2711</td>
<td>2573</td>
<td>2161</td>
<td>1723</td>
<td>1845</td>
<td>1678</td>
<td>109</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>179.7 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Jute (Kharif).  
Object: To find out the optimum time of thinning for Jute fibre.

Ref: J.A.R.I. 56(21).  
Type = 'C'.

## 1. BASAL CONDITIONS:

(i) (a) to (c) N.A.  (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 23.6.1956.  (iv) (a) Ploughing and laddering. (b) Line sowing. (c) N.A. (d) Row 1 apart. (e) N.A. (f) N.A. (g) J.R.O.—632.  (vii) Unirrigated. (viii) Weeding and thinning as per treatments.  (ix) 69.39°.  (x) 4.10.1956.

## 2. TREATMENTS to 4. GENERAL:

Same as in exp. no. 56(20) on page 261.

## 5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1857</td>
<td>223</td>
<td>1857</td>
<td>1678</td>
<td>109</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>197.7 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Object
To find out the optimum time of interculture for Jute fibre.

### BASAL CONDITIONS

2. **TREATMENTS**

   3. **DESIGN and GENERAL:**
   
   Same as in expt. no. 56(20) on page 261.

5. **RESULTS**

   (i) 1973 lb./ac. (ii) 155.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2712</td>
<td>2244</td>
<td>2062</td>
<td>1811</td>
<td>1819</td>
<td>1799</td>
<td>1753</td>
<td>1586</td>
</tr>
</tbody>
</table>

S.E./mean = 89.8 lb./ac.

---

### Crop: Jute (Kharif).


Ref: J.A.R.I. 54(14).

Type: 'CV'.

Object: To study the effect of different dates of sowing on the yield of different varieties of Jute fibre.
1. BASAL CONDITIONS:
   (i) (a) Jute—Mustard. (b) Mustard. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) As per treatments. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb./ac. (d) 12'x3'. (e) 1. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 2 weeding, 2 thinnings and 4 to 5 wheel hoeings. (ix) N.A. (x) 24.6.1954 to 23.10.1954.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   2 varieties: V₁=D₁ and V₂=Fanduk.

3. DESIGN:
   (i) Split-plot. (ii) 6 main-plots/block; 2 sub-plots/main-plot. (b) 4'x51'. (iii) 6. (iv) (a) 7'x24'. (b) 5'x21'. (c) 1'x1'. (v) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Stand count, height, green and dry fibre yield. (iv) (a) 1954-1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1673 lb./ac. (ii) (a) 333.4 lb./ac. (b) 214.3 lb./ac. (iii) Main effects of D and V are highly significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>D₅</th>
<th>D₆</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>V₁</td>
<td>1882</td>
<td>2233</td>
<td>2586</td>
<td>1451</td>
<td>781</td>
<td>325</td>
<td>1545</td>
</tr>
<tr>
<td>V₂</td>
<td>1549</td>
<td>2105</td>
<td>2255</td>
<td>1089</td>
<td>475</td>
<td>225</td>
<td>1283</td>
</tr>
<tr>
<td>Mean</td>
<td>1716</td>
<td>2169</td>
<td>2421</td>
<td>1270</td>
<td>628</td>
<td>280</td>
<td>1414</td>
</tr>
</tbody>
</table>

S.E.'s—N.A.

Crop :- Jute (Kharif).

Object :- To study the effect of different dates of sowing on the yield of different varieties of Jute fibre.

1. BASAL CONDITIONS:
   (i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) As per treatments. (iv) (a) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb./ac. (d) 12'x3'. (e) 1. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 weeding, 2 thinnings and 4 to 5 wheel hoeings. (ix) 61.75'. (x) 23.8.1954 to 23.10.1954.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   2 varieties: V₁=D₁ and V₂=Fanduk.

3. DESIGN and 4. GENERAL:
   Same as in exp. no. 54(14) on page 253.

5. RESULTS:
   (i) 1673 lb./ac. (ii) (a) 333.4 lb./ac. (b) 214.3 lb./ac. (iii) Main effects of V and D are highly significant. (iv) Av. yield of fibre in lb./ac.
Crop = Jute (Kharif).


Object = To study the effect of different dates of sowing on the yield of different varieties of Jute fibre.

1. BASAL CONDITIONS:
   (i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii)
   As per treatments. (iv) 4 to 5 ploughings and ladderings. (b) Drilling. (c) 5 lb./ac. (d) 12" x 3". (e) 1.
   (f) Nil. (vi) As per treatments. (vii) 2 weedicings, 2 thinnings and 4 to 5 wheel hoeings. (viii) 61.75".

2. TREATMENTS:
   Main-plot treatments:
   6 dates of sowing: D_1 = 16.3.1955, D_2 = 5.4.1955, D_3 = 25.4.1955, D_4 = 15.5.1955, D_5 = 4.6.1955 and

   Sub-plot treatments:
   2 varieties: V_1 = C.G. and V_2 = J.R.O.—632.

3. DESIGN and GENERAL:
   Same as in expt. no. 54(14) on page 263.

4. RESULTS:
   (i) 1424 lb./ac. (ii) (a) 399.2 lb./ac. (b) 182.0 lb./ac. (iii) Main effects of V and D are highly significant
   and interaction VxD is significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D_1</th>
<th>D_2</th>
<th>D_3</th>
<th>D_4</th>
<th>D_5</th>
<th>D_6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_1</td>
<td>541</td>
<td>1541</td>
<td>1670</td>
<td>1545</td>
<td>1189</td>
<td>665</td>
<td>1192</td>
</tr>
<tr>
<td>V_2</td>
<td>1065</td>
<td>2415</td>
<td>1973</td>
<td>1926</td>
<td>1689</td>
<td>867</td>
<td>1656</td>
</tr>
<tr>
<td>Mean</td>
<td>803</td>
<td>1978</td>
<td>1822</td>
<td>1736</td>
<td>1439</td>
<td>765</td>
<td>1424</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. D marginal means = 163.0 lb./ac.
2. V marginal means = 42.9 lb./ac.
3. V means at the same level of D = 105.1 lb./ac.
4. D means at the same level of V = 179.1 lb./ac.
Crop: Jute (Kharif).

Ref: J.A.R.I., 56(29).
Type: "CV".

Object: To study the optimum date of sowing and optimum stage of harvest of different varieties of Jute.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) As per treatments.
   (iv) (a) 4 to 5 ploughings and 2 ladderings. (b) Line sowing by drill. (c) V₁ at 41 gms./plot and V₂ at 43 gms./plot.
   (d) Rows 1' apart. (e) N.A. (f) N.A. (v) As per treatments. (vi) Unirrigated. (vii) 4 to 5 weedings, hoings and thinning. (ix) N.A. (x) As per treatments.

2 TREATMENTS:
   Main-plot treatments:
   2 varieties of jute: V₁ = J.R.C.-321 (early) and V₂ = J.R.C.-212 (late).
   Sub-plot treatments:
   Treatments in one direction:

   Treatments in orthogonal direction:
   4 stages of harvest: D₁ = 100 days, D₂ = 120 days, D₃ = 140 days after sowing and D₄ = Small pod stage.

3. DESIGN:
   (i) Split-cum-strip-plot. (ii) 2 main-plot blocks, 6 strips in one direction and 4 in orthogonal direction/ main-plot. (iii) 3.
   (iv) (a) 21'×17'. (b) 19'×15'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of fibre. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1017 lb./ac. (ii) S.E. (V₁) = 1479.1 lb./ac. S.E. (S) = 563.9 lb./ac. S.E. (D) = 772.7 lb./ac. S.E. (S×D) = 1307.0 lb./ac. (iii) Main effect of S is highly significant and effect of D is significant. (iv) Av. yield of Jute fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>S₆</th>
<th>Mean</th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
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<tbody>
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<td>1393</td>
<td>714</td>
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<td>67</td>
<td>809</td>
<td>578</td>
<td>831</td>
<td>889</td>
<td>918</td>
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<tr>
<td>V₂</td>
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<td>1898</td>
<td>1873</td>
<td>1479</td>
<td>273</td>
<td>106</td>
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<td>777</td>
<td>1169</td>
<td>1327</td>
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<td>1469</td>
<td>1562</td>
<td>1633</td>
<td>1096</td>
<td>256</td>
<td>87</td>
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<td>1017</td>
<td>678</td>
<td>1010</td>
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<td>1273</td>
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<td>1736</td>
<td>1111</td>
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<td>1225</td>
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<tr>
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<td>104</td>
<td>1017</td>
<td>678</td>
<td>1010</td>
<td>1108</td>
<td>1273</td>
</tr>
</tbody>
</table>

S.E. of difference of two 
1. V marginal means = 246.5 lb./ac. 
2. S marginal means = 248.5 lb./ac. 
3. D marginal means = 182.1 lb./ac. 
4. S means at the same level of V = 351.5 lb./ac. 
5. V means at the same level of S = 404.6 lb./ac. 
6. D means at the same level of V = 257.6 lb./ac. 
7. V means at the same level of D = 322.5 lb./ac. 
8. D means at the same level of S = 712.5 lb./ac. 
9. S means at the same level of D = 699.2 lb./ac.
1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) As per treatments. (iv) (a) Ploughing and laddering. (b) Line sowing by drill. (c) N.A. (d) 1' between rows. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and thinning. (ix) N.A. (x) As per treatments.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 56(29) on page 266.

3. RESULTS:
   (i) 1175 lb./ac. (ii) S.E. (V) = 454.2 lb./ac. S.E. (S) = 407.9 lb./ac. S.E. (D) = 251.4 lb./ac. S.E. (S x D) = 890.7 lb./ac. (iii) Main effect of V is significant. Main effects of S, D and interaction D x V are highly significant. (iv) Av. yield of jute fibre in lb./ac.
Crop : Jute (Kharif).
Type : 'CV'.

Object :— To study the optimum date of sowing and stage of harvest of different varieties of Jute

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) As per treatments. (iv) (a) 4 to 5 ploughings and laddering. (b) Line sowing by drill. (c) to (e) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and thinning. (ix) N.A. (x) As per treatments.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 56(19) on page 266.
   Dates of sowing are: S₁ = 21.3.1959, S₂ = 5.4.1959, S₃ = 20.4.1959, S₄ = 5.5.1959, S₅ = 20.5.1959 and S₆ = 4.6.1959.

3. RESULTS:
   (i) 612 lb./ac. (ii) S.E. (V) = 640.2 lb./ac. S.E. (S) = 436.0 lb./ac. S.E. (D) = 333.1 lb./ac. S.E. (S x D) = 578.3 lb./ac. (iii) Main effect of D alone is highly significant. (iv) Av. yield of jute fibre in lb./ac.

<table>
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<th></th>
<th>S₁</th>
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<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>S₆</th>
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S.E. of difference of:
1. V marginal means = 75.7 lb./ac. 6. D means at the same level of V = 83.8 lb./ac.
2. S marginal means = 117.8 lb./ac. 7. V means at the same level of D = 104.9 lb./ac.
3. D marginal means = 59.3 lb./ac. 8. D means at the same level of S = 473.1 lb./ac.
4. S means at the same level of V = 166.5 lb./ac. 9. S means at the same level of D = 460.7 lb./ac.
5. V means at the same level of S = 169.8 lb./ac.

Ref : I.A.R.I. 59(17).
Crop : Jute (Kharif).


Object: To study the optimum date of sowing and stage of harvest of different varieties of Jute.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) A& per treatments. (iv) (a) 5 to 6 ploughings and ladderings. (b) Line sowing by drill. (c) N.A. (d) Row 1' apart. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 4 to 5 weedings and thinnings. (ix) N.A. (x) As per treatments.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties of Jute: V = C.G. (local) and V = J.R.O.-632 (late).
   Sub-plot treatment:
   Treatment in one direction:
   6 dates of sowing: S1 = 21.3.1956, S2 = 5.4.1956, S3 = 20.4.1956, S4 = 5.5.1956, S5 = 20.5.1956 and S6 = 4.6.1956.
   Treatment in orthogonal direction:
   4 stages of harvest: D1 = 100 days, D2 = 120 days, D3 = 140 days after sowing and D4 = Small Pod stage.

3. DESIGN:
   (i) Split-cum-strip-plot. (ii) (a) 2 main-plots/block; 6 strips in one direction and 4 in orthogonal direction/main-plot. (b) 15' x 141'. (iii) 3. (iv) (a) 21' x 17'. (b) 19' x 15'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of fibre. (iv) (a) 1916-contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 1222 lb./ac. (ii) S.E. (V) = 390.4 lb./ac., S.E. (S) = 410.9 lb./ac. S.E. (D) = 267.9 lb./ac. S.E. (SxS) = 136.1 lb./ac. (iii) Main effect of V and interaction S x V are significant. Main effects of S and D are highly significant. (iv) Av. yield of jute fibre in lb./ac.

<table>
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<tr>
<th></th>
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<th>S3</th>
<th>S4</th>
<th>S5</th>
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S.E. of difference of two
1. V marginal means = 63.1 lb./ac. 6. D means at the same level of V = 89.3 lb./ac.
2. S marginal means = 118.6 lb./ac. 7. V means at the same level of D = 101.1 lb./ac.
3. D marginal means = 63.1 lb./ac. 8. D means at the same level of S = 724.3 lb./ac.
4. S means at the same level of V = 167.7 lb./ac. 9. S means at the same level of D = 694.8 lb./ac.
5. V means at the same level of S = 166.4 lb./ac.

Ref.: J.A.R.I. 56(28).

Type: "CV".
Crop = Jute (Kharif).

Object: To study the optimum date of sowing and stage of harvest of different varieties of Jute.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Roll soil analysis, Nilganj. (iii) As per treatments. (iv) (a) Ploughing and laddering. (b) Line sowing by drill. (c) N.A. (d) Row 1' apart. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and thinning. (ix) N.A. (x) As per treatments.

2. TREATMENTS to 4. GENERAL:
Same as in expr. no. 56(28) on page 269.
Dates of sowing are: S1 = 21.3.1957, S2 = 5.4.1957, S3 = 20.4.1957, S4 = 5.5.1957, S5 = 20.5.1957 and S6 = 4.6.1957.

5. RESULTS:
(i) 1792 lb./ac. (ii) S.E. (V) = 77.8 lb./ac. (iii) S.E. (S) = 122.2 lb./ac. (iv) S.E. (D) = 103.8 lb./ac. (v) S.E. (SxV) = 146.8 lb./ac.

<table>
<thead>
<tr>
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<th>S3</th>
<th>S4</th>
<th>S5</th>
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<th>D2</th>
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S.E. of difference of two
1. V marginal means = 77.8 lb./ac.
2. S marginal means = 122.2 lb./ac.
3. D marginal means = 103.8 lb./ac.
4. S means at the same level of V = 172.7 lb./ac.
5. V means at the same level of S = 175.8 lb./ac.
6. D means at the same level of V = 146.8 lb./ac.
7. V means at the same level of D = 149.0 lb./ac.
8. D means at the same level of S = 395.4 lb./ac.
9. S means at the same level of D = 382.0 lb./ac.
Crop: Jute (*Kharij*).
Type: CV
Ref: J.A.R.I. 59(16).

Object: To study the optimum date of sowing and stage of harvest of different varieties of Jute.

**1. BASAL CONDITIONS:**
(i) (a) to (e) N.A.  (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) As per treatments. (iv) (a) Ploughing and laddering. (b) Line sowing by drill. (c) to (e) N.A.  (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and thinning. (ix) N.A.  (x) As per treatments.

**2. TREATMENTS to 4. GENERAL:**
Same as in exp. no. 56(28) on page 269.
Dates of sowing are: S1 = 21.3.1959, S2 = 5.4.1959, S3 = 20.4.1959, S4 = 5.5.1959, S5 = 20.5.1959 and S6 = 4.6.1959.

**5. RESULTS:**
(i) 1302 lb./ac.  (ii) S.E. (V) = 870.4 lb./ac.  S.E. (S) = 74.9 lb./ac.  S.E. (D) = 433.4 lb./ac.  S.E. (S x D) = 763.4 lb./ac.  (iii) Main effects of S and D are significant.  (iv) Av. yield of jute fibre in lb./ac.

<table>
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<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
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Crop : Jute (Kharif).
Object : To study the effect of different levels of N and spacings on different varieties of Jute.

1. BASAL CONDITIONS :
   (i) (a) Mustard. (b) Mustard. (c) Nil. (d) Sandy loam. (b) As per treatments. (c) 5 lb./ac. (d) As per treatments. (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings, 2 thinnings and 4 to 6 wheel hoeings. (ix) 43.68'.

2. TREATMENTS:
   All combinations of (1), (l) and (3)
   (1) 2 varieties; V1=C.G. (early) and V2=J.R.O.-6l2 (medium).
   (2) 2 levels of N as compost and A/S in 1 : 1 ratio: N0=0 and N1=40 lb./ac.
   (3) 4 spacings: S1=Irregular (broadcast), S2=Irregular with light thinning, S3=2'x12" and S4=3'x12".

3. DESIGN :
   (i) Fact. in R.B.D. (ii) 16. (b) 142' X 102'. (iii) 4. (iv) 50'X15'. (b) 48'X14'. (v) 1'X1'. (vii) Yes.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Nil. (iv) Green plant and dry fibre yield, stand count and average height. (v) 1953 -1954. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1485 lb./ac. (ii) 250.3 lb./ac. (iii) Main effects of V, N and interaction V X N are highly significant. (iv) Av. yield of dry fibre in lb./ac.

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S.E. of S marginal mean = 62.5 lb./ac.
S.E. of V or N marginal mean = 44.2 lb./ac.
S.E. of body of N X S or V X S table = 88.5 lb./ac.
S.E. of body of N X V table = 62.5 lb./ac.
1. **BASAL CONDITIONS**:
   (i) (a) Jute—Mustard. (b) Mustard. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 7.5.1954. (iv) (a) 4 to 5 ploughings and ladderings. (b) As per treatments. (c) 5 lb./ac. (d) As per treatments. (e) 1. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings, thinnings and 4 to 6 wheel hoeings. (ix) 43.68'. (x) 6 and 23.9.1954.

2. **TREATMENTS**:
   All combinations of (1), (2) and (3)
   (1) 2 varieties: \( V_1 = \text{Fanduk (medium)} \) and \( V_2 = D-154 \) (medium).
   (2) 2 levels of \( N \) as compost and A/S in 1:1 ratio: \( N_0 = 0 \) and \( N_1 = 40 \) lb./ac.
   (3) 4 spacings: \( S_1 = \text{Broadcast} \), \( S_2 = \text{Broadcast with light thinning} \), \( S_3 = 2\times12' \), \( S_4 = 3'\times12' \).

3. **DESIGN**
   (i) Fact. in R.B.D. (ii) (a) 18. (b) 118'\times82'. (iii) 3. (iv) (a) \( S_1 \times V \times N \) table. (b) \( S_2 \times V \times N \) table. (v) Yes.

4. **GENERAL**:
   (i) Good. (ii) N.A. (iii) Yield of fibre. (iv) (a) 1959—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.
5. RESULTS:
(i) 2007 lb./ac. (ii) 171.2 lb./ac. (iii) Main effects of V and S are highly significant. (iv) Av. yield of fibre in lb./ac.

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S.E. of V or N marginal mean = 40.4 lb./ac.
S.E. of S marginal mean = 52.9 lb./ac.
S.E. of body of V x N table = 69.9 lb./ac.
S.E. of body of V x S or N x S table = 57.1 lb./ac.

Crop :- Jute (Kharif).
Object :- To study the efficacy of fungicides against stem-rot of Jute.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Pea. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilgaij. (iii) 3.6.1955. (iv) (a) 4 to 6 ploughings and laddering. (b) Broadcast. (c) 10 lb./ac. (d) 4" between plants. (e) 1. (v) 3 tons/ac. of T.C.+A/O at 20 lb./ac. of N. (vi) J.R.C.-412 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) 61.75'. (x) 6.10.1955.

2. TREATMENTS:
11 fungicides: F0 = Control (no fungicide), F1 = Perenox (0.6 %), F2 = Colloidal copper (0.5 %), F3 = Cupravit (0.5 %), F4 = Agricop (0.5 %), F5 = Shell copper fungicide (0.5 %), F6 = Bordeaux mixture 4 : 4 : 50, F7 = Lime Sulphur (1 %), F8 = Dithane Z-78 (0.4 %), F9 = Dithane D-14 with Zinc Sulphate (0.4 %) and F10 = Metzate (0.4 %).

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (v) (a) 12' x 32'. (b) 10' x 30'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Stem rot, control measures as per treatments. (iii) Number of diseased plants and fibre yield. (iv) (a) 1955—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1729 lb./ac. (ii) 354.0 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of dry fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F0</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
<th>F6</th>
<th>F7</th>
<th>F8</th>
<th>F9</th>
<th>F10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1770</td>
<td>2117</td>
<td>1609</td>
<td>1738</td>
<td>1831</td>
<td>1963</td>
<td>1955</td>
<td>1565</td>
<td>1593</td>
<td>1025</td>
<td>1812</td>
</tr>
</tbody>
</table>

S.E./mean = 177.0 lb./ac.
Crop: Jute (Kharif).  
Object: To study the efficacy of fungicides against stem-rot of Jute.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Pea. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 17.5 1935. (iv) (a) 4 to 6 ploughings, and 1 pairings. (b) Broadcast. (c) 10 lb/ac. (d) 4" between plants. (e) 1. (v) 3 tons/ac. of compost and A/S at 20 lb/ac. (vi) J.R.C. - 412 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) N.A. (x) 2.9.1956.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 55(8) on page 274.

5. RESULTS:
   (i) 1146 lb/ac. (ii) 232.3 lb/ac. (iii) Treatment differences are significant. (iv) Av. yield of dry fibre in lb/ac.
   Treatment  | F0  | F1  | F2  | F3  | F4  | F5  | F6  | F7  | F8  | F9  | F10 |
-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Av. yield    | 871 | 1433| 1172| 1427| 1376| 1212| 1253| 1231| 1259| 1355| 1243|
S.E./mean    | 116.2 lb/ac.

Crop: Jute (Kharif).  
Object: To study the efficacy of fungicides against stem-rot of Jute.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Pea. (c) 3 tons/ac. of compost. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) 8.6.1957. (iv) (a) 4 to 6 ploughings, and ladderings. (b) Broadcast. (c) 10 lb/ac. (d) 4" between plants. (e) 1. (vi) 3 tons/ac. of T.C + A/S at 20 lb/ac. of N. (vi) J.R.C. - 412 (medium). (vii) Unirrigated. (viii) 2 weedings and 1 thinning. (ix) N.A. (x) 19.9.1957.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 55(8) on page 274.

5. RESULTS:
   (i) 1896 lb/ac. (ii) 410.3 lb/ac. (iii) Treatment differences are significant. (iv) Av. yield of dry fibre in lb/ac.
   Treatment  | F0  | F1  | F2  | F3  | F4  | F5  | F6  | F7  | F8  | F9  | F10 |
-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Av. yield    | 1093| 1742| 2162| 1779| 1437| 1742| 2325| 2132| 1988| 2574| 1699|
S.E./mean    | 205.2 lb/ac.
1. BASAL CONDITIONS:
   (i) (a) and (b) Jute—Paddy—Pulse. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) Jute: 25.4.1957, paddy: as per treatments and pulse: N.A. (iv) (a) 3 to 4 ploughings, laddering and harrowing. (b) Lines sowing for jute, transplanting for paddy and broadcast for pulse. (c) Jute at 5 to 6 lb./ac. and pulse at 12 to 15 lbs./ac. and paddy at 2 lbs./ac. (d) 12" × 3". (e) 3 to 4 for paddy. (vi) N.A. (vii) Jute: J.R.C.-212 (late), paddy: patnai-23 and pulse: khasari. (viii) Unirrigated. (ix) 2 to 3 weedings all thinnings. (x) 458 lb./ac. (xi) 458 lb./ac. (xii) None of the effects is significant. (xiii) Yield of grains and fibre. (xiv) Yes. (xv) Nil. (xvi) Nil. (xvii) Jute crop during 1957, the starting year of the exp., was sown in the same plot just to maintain the cropping pattern.

2. TREATMENTS:
   All combinations of (1) and (2)+2 extra treatments for paddy and pulse
   (1) 3 dates of transplanting of paddy: T1=1st August, T2=16th August and T3=31st August.
   (2) 2 levels of manuring to Paddy crop: M1=50 mds./ac. of F.Y.M. and M2=200 mds./ac. of F.Y.M.+1.5 mds./ac. of Super+25 urs./ac. of A/S during puddling+25 urs./ac. of A/S after transplanting.

Extra treatments to paddy and pulse: E1=M4 only and E2=M3 only.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8 for paddy and pulse: 6 for jute. (b) 70'×46'. (iii) 6. (iv) (a) 16'×22'. (b) 14'×20'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of grains and fibre. (iv) (a) 1957—1961. (b) Yes. (c) Nil. (v) and (vi) Nil.

5. RESULTS:

   Paddy
   (i) 301 lb./ac. (ii) 738.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>3090</td>
<td>3083</td>
<td>2650</td>
<td>2921</td>
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</tr>
<tr>
<td>Mean</td>
<td>3023</td>
<td>3082</td>
<td>3016</td>
<td>3040</td>
</tr>
</tbody>
</table>

   S.E. of T marginal mean = 213.1 lb./ac.
   S.E. of M marginal mean = 174.1 lb./ac.
   S.E. of body of table or E mean = 301.6 lb./ac.

   Khasari
   (i) 458 lb./ac. (ii) 201.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>Mean</th>
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<tr>
<td>M1</td>
<td>466</td>
<td>542</td>
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<td>M2</td>
<td>389</td>
<td>507</td>
<td>446</td>
<td>447</td>
</tr>
<tr>
<td>Mean</td>
<td>428</td>
<td>524</td>
<td>496</td>
<td>483</td>
</tr>
</tbody>
</table>
Site: Jute Agri. Res. Inst., Nilganj.  Type: 'CM'.

Object: —To study the possibilities of triple cropping with Jute, Paddy and Pulse with varying dates of transplanting of Paddy.

1. BASAL CONDITIONS:
   (i) (a) and (b) Jute—Paddy—Pulse. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) Jute: 25.4.1958, Paddy: as per treatments and pulse: N.A. (iv) (a) 3 to 4 ploughings, 2 laderlines and 1 harrowing. (b) Line sowing for Jute, transplanting for Paddy and broadcast for Pulse. (c) Jute at 5 to 6 lb./ac., Paddy at 35 lb./ac. and pulse at 40 lb./ac. (d) N.A. (e) 3 to 4 for Paddy, (v) N.A. (vi) Jute: J.R.C.—212 (late), Paddy: patnai—23 and Pulse: khhasari. (vii) Unirrigated. (viii) 3 to 4 weedings. (ix) 45.26'. (x) Jute on 24.7.1958, 8.8.1958 and 23.8.1958, Paddy on 15.12.1958 and Pulse on 19.3.1958.

2. TREATMENTS to 4, GENERAL:
   Same as in expt. no. 57(26) on page 275.

5. RESULTS:

Jute
(i) 1525 lb./ac.  (ii) 185.6 lb./ac.  (iii) Main effect of T alone is highly significant.  (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
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<td>M₂</td>
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<td>1562</td>
</tr>
<tr>
<td>Mean</td>
<td>1248</td>
<td>1596</td>
<td>1730</td>
<td>1525</td>
</tr>
</tbody>
</table>

S.E. of T marginal mean = 53.6 lb./ac.
S.E. of M marginal mean = 43.7 lb./ac.
S.E. of body of table = 75.8 lb./ac.

Paddy
(i) 2286 lb./ac.  (ii) 802.0 lb./ac.  (iii) None of the effects is significant.  (iv) Av. yield of grain in lb./ac.

E₁ = 1947 lb./ac. and E₂ = 2187 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₁</th>
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<th>T₃</th>
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<td>2503</td>
<td>2178</td>
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<tr>
<td>M₂</td>
<td>2470</td>
<td>2473</td>
<td>2677</td>
<td>2540</td>
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<tr>
<td>Mean</td>
<td>2178</td>
<td>2308</td>
<td>2590</td>
<td>2359</td>
</tr>
</tbody>
</table>

S.E. of T marginal mean = 211.5 lb./ac.
S.E. of M marginal mean = 189.0 lb./ac.
S.E. of body of table or E mean = 317.4 lb./ac.

Khasari
(i) 325 lb./ac.  (ii) 56.8 lb./ac.  (iii) Interaction T × M alone is significant.  (iv) Av. yield of grain in lb./ac.
E = 342 lb./ac. and P = 395 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
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</tr>
</thead>
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<td>M1</td>
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<td>402</td>
<td>326</td>
<td>339</td>
</tr>
<tr>
<td>M2</td>
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<td>281</td>
</tr>
<tr>
<td>Mean</td>
<td>328</td>
<td>331</td>
<td>270</td>
<td>310</td>
</tr>
</tbody>
</table>

S.E. of T marginal mean = 28.5 lb./ac.
S.E. of M marginal mean = 23.3 lb./ac.
S.E. of body of table or E mean = 40.3 lb./ac.

Crop: Jute, Paddy and Pulse.
Ref: J.A.R.I. 59(19).
Type: 'CM'.

Object: To study the possibilities of triple cropping with Jute, Paddy and Pulse with varying dates of transplantation of Paddy.

1. BASAL CONDITIONS:
   (i) (a) and (b) Jute—Paddy—Pulse. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) Jute: 25.4.1959, paddy: as per treatments and pulse: N.A. (iv) (a) 4 ploughings, 2 laddering and 1 harrowing. (b) Line sowing for jute, transplanting for paddy and broadcast for pulse. (c) Jute at 5 to 6 lb./ac., paddy at 35 lb./ac. and pulse at 40 lb./ac. (d) N.A. (e) 3 to 4 for paddy. (v) N.A. (vi) Jute: J.R.C. 212 [late], paddy: parvat—23 and pulse: khasari. (vii) Unirrigated. (viii) 3 to 7 weedings and thinning. (ix) 82.6°. (x) 24.7.1959 to 23.8.1959 for jute, 26.11.1959 to 7.12.1959 for paddy and 23.3.1960 for pulse.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 57(26) on page 275.

5. RESULTS:

   Jute
   (i) 1993 lb./ac. (ii) 174.2 lb./ac. (iii) Main effect of T alone is highly significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>1935</td>
<td>1825</td>
<td>2147</td>
<td>1969</td>
</tr>
<tr>
<td>M2</td>
<td>1950</td>
<td>1836</td>
<td>2267</td>
<td>2018</td>
</tr>
<tr>
<td>Mean</td>
<td>1942</td>
<td>1830</td>
<td>2207</td>
<td>1993</td>
</tr>
</tbody>
</table>

   S.E. of T marginal mean = 50.3 lb./ac.
   S.E. of M marginal mean = 41.0 lb./ac.
   S.E. of body of table = 71.1 lb./ac.

   Paddy
   (i) 2037 lb./ac. (ii) 361.8 lb./ac. (iii) Interaction T x M alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>M1</td>
<td>1935</td>
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<tr>
<td>Mean</td>
<td>1942</td>
<td>1830</td>
<td>2207</td>
<td>1993</td>
</tr>
</tbody>
</table>
Crop : Jute, Paddy and Pulse.

Object : To study the possibilities of triple cropping with Jute, Paddy and Pulse.

1. BASAL CONDITIONS:
(i) (a) and (b) Jute—Paddy—Pulse. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) Jute : as per treatments, paddy : 14.8.1956 and pulse : N.A. (iv) (a) 3 to 4 ploughings, laddering and harrowing. (b) Line sowing for jute, transplanting for paddy and broadcast for pulse. (c) Jute at 7 lb./ac. and paddy at 32 lb./ac. (d) 3'×1'. (e) 3 to 4 for paddy. (vi) 200 mds./ac. of cowdung+60 srs./ac. of Super+25 srs./ac. of A/S. (v) Jute : as per treatments, paddy : patnai—23 and pulse : khasari. (vii) Irrigated. (viii) 2 to 3 weedings and thinning. (ix) 9.29'. (x) Jute on 11.8.1956 and paddy on 9.1.1957.

2. TREATMENTS:
All combinations of (1), (2) and (3)+2 extra treatments for paddy.
(1) 2 varieties of jute : V1 = J.R.C. 321 (early) and V2 = J.R.C. 212 (latest).
(2) 3 dates of sowing of jute : S1 = 13th April, S2 = 29th April and S3 = 13th May.
(3) 2 levels of manuring to Paddy crop : M1 = 50 mds./ac. of F.Y.M., M2 = 200 mds./ac. of F.Y.M.+4.5 mds./ac. of Super+25 srs./ac. of A/S during puddling+25 srs./ac. of A/S after transplanting.

Extra treatments for paddy : E1 = Paddy transplanted with M1 alone and E2 = Paddy transplanted with M2 alone.

3. DESIGN :
(i) R.B.D. (ii) (a) 12 for jute and pulse and 14 for paddy. (b) 90'×95'. (iii) 3. (iv) (a) 44'×12'. (b) 42'×10'. (c) 1'×1'. (v) Yes.

\[
\begin{array}{|c|c|c|c|}
\hline
 & T_1 & T_2 & T_3 & \text{Mean} \\
\hline
M_1 & 2278 & 1769 & 2455 & 2167 \\
M_2 & 1835 & 2003 & 1989 & 1942 \\
\hline
\text{Mean} & 2056 & 1886 & 2222 & 2015 \\
\hline
\end{array}
\]

S.E. of T marginal mean = 104.4 lb./ac.
S.E. of M marginal mean = 85.3 lb./ac.
S.E. of body of table or E mean = 147.7 lb./ac.

Khasari
(i) 760 lb./ac. (ii) 145.5 lb./ac. (iii) Main effect of T is significant and main effect of M is highly significant.
(iv) Av. yield of grain in lb./ac. E1 = 763 lb./ac. and E2 = 831 lb./ac.

Crop :- Jute, Paddy and Pulse.

Ref : J.A.R.I. 56(30).
Type : CMV.
4. GENERAL:
(i) Good. Pulse crop failed completely. (ii) N.A. (iii) Yield of grain and fibre. (iv) (a) 1916 - 1959. (b) Yes. (c) Nil. (v) and (vi) Nil. For Jute crop during 1956, the starting year of the expt., there are actually 6 treatments (2 varieties x 3 dates of sowing) each obtained from two plots in each replication.

5. RESULTS:

Jute

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>1192</td>
<td>1016</td>
<td>136</td>
<td>781</td>
</tr>
<tr>
<td>V2</td>
<td>1258</td>
<td>942</td>
<td>128</td>
<td>779</td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 43.0 lb./ac.
S.E. of V marginal mean = 35.1 lb./ac.
S.E. of body of S x V table = 60.8 lb./ac.

Paddy

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
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<tbody>
<tr>
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<tr>
<td>V2</td>
<td>2496</td>
<td>2576</td>
<td>2571</td>
<td>2568</td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 55.4 lb./ac.
S.E. of V or M marginal mean = 45.3 lb./ac.
S.E. of body of S x V or S x M table = 78.4 lb./ac.
S.E. of body of V x M table = 64.0 lb./ac.
S.E. of E mean = 110.9 lb./ac.

Crop :- Jute, Paddy and Pulse.
Ref :- J.A.R.I. 57(25).
Type :- 'CMV'.

Object :- To study the possibilities of triple cropping with Jute, Paddy and Pulse.

5. BASAL CONDITIONS:
(i) (a) and (b) Jute-Paddy-Pulse. (c) As per treatments. (ii) (a) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) Jute: as per treatments. paddy : 14.8.1959 and pulse : N.A. (iv) (a) 3 to 4 ploughings, harrowings and horrizing. (b) Line sowing for jute, transplanting for paddy, and broadcast for pulse. (c) Jute at 3 to 4 lb./ac., paddy at 16 to 18 rrs./ac. and pulse at 20 hrs./ac. (d) 3' x 1'. (e) 3 to 6 for paddy. (f) 200 msds./acr. of cowdung+60 rrs./ac. of Super+25 rrs./ac. of A/S. (g) Jute : as per treatments, paddy : pannal - 23 and pulse khasari. (h) Irrigated. (i) 3 to 4 weedings and thinning. (j) 48-33'. (x) Jute on 11.8.1957, paddy on 7.1.1958 and pulse on 28.3.1958.
2. **TREATMENTS** and 3. **DESIGN**:

Same as in expt. no. 56(30) on page 279.

4. **GENERAL**:

(i) Good. (ii) N/A. (iii) Yield of grain and fibre. (iv) (a) 1956 – 1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS**:

### Jute

(i) 1168 lb./ac. (ii) 148.3 lb./ac. (iii) Main effects of S and V are highly significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>V1</th>
<th>V2</th>
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<tr>
<td>V1</td>
<td>962</td>
<td>974</td>
<td>1076</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>1069</td>
<td>1202</td>
<td>1366</td>
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</tr>
</tbody>
</table>

S.E. of S marginal mean = 42.8 lb./ac.
S.E. of M or V marginal mean = 35.0 lb./ac.
S.E. of body of S × M or S × V table = 60.5 lb./ac.
S.E. of body of V × M table = 49.4 lb./ac.

### Paddy

(i) 3244 lb./ac. (ii) 334.6 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
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<th>V2</th>
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<td>3130</td>
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<td>3242</td>
<td>3268</td>
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</tr>
<tr>
<td>V1</td>
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<td>3210</td>
<td>3228</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>3261</td>
<td>3051</td>
<td>3350</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 96.6 lb./ac.
S.E. of M or V marginal mean = 78.9 lb./ac.
S.E. of body of S × V or S × M table = 136.6 lb./ac.
S.E. of body of V × M table = 193.2 lb./ac.

### Khasuri

(i) 556 lb./ac. (ii) 154.4 lb./ac. (iii) Main effect of M alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
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<th>S3</th>
<th>Mean</th>
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<th>V2</th>
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<td>497</td>
<td>495</td>
<td>508</td>
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<tr>
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<td>568</td>
<td>519</td>
<td>556</td>
<td>572</td>
<td>540</td>
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<td>560</td>
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<tr>
<td>V2</td>
<td>652</td>
<td>490</td>
<td>478</td>
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</tbody>
</table>
Crop: Jute, Paddy and Pulse.
Ref: J.A.R.I. 58(21).
Type: CMV.
Object: To study the possibilities of triple cropping with Jute, Paddy and Pulse.

1. BASEL CONDITIONS:
   (i) Jute—Paddy—Pulse (b) and (c) As per treatments. (ii) Sandy loam. (b) Refer soil analysis, Nilganj. (iii) Jute: As per treatments, Paddy: 14.8.1958 and Pulse: December, 1958. (iv) 3 ploughings and laddering. (b) Line sowing for jute, transplanting for paddy and broadcast for pulse. (c) Jute at 5 to 6 lb./ac., paddy at 16 to 18 yrs./ac. and pulse at 20 yrs./ac. (d) 37 × 1'. (e) 3 for paddy. (v) 200 mds./ac. of cowdung+60 yrs./ac. of Super+25 yrs./ac. of A/S. (vi) Jute: as per treatments, paddy: patnai—23 and pulse: khasari. (vii) Irrigated. (viii) Weeding and thinning. (ix) 45.26...

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 50(30) on page 279.

4. GENERAL:
   (i) Good. (ii) N.A.T. (iii) Yield of grain and fibre. (iv) New, 1956—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Jute
   (i) 1090 lb./ac. (ii) 161.7 lb./ac. (iii) Main effects of S and V are highly significant. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
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<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
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<th>V1</th>
<th>V2</th>
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<tr>
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<td>1332</td>
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<td>1307</td>
<td>1059</td>
<td>1090</td>
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<tr>
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<td>1163</td>
<td>516</td>
<td>516</td>
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</tr>
<tr>
<td>V2</td>
<td>952</td>
<td>1450</td>
<td>1203</td>
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</tr>
</tbody>
</table>

S.E. of S marginal mean = 46.7 lb./ac.
S.E. of V or M marginal mean = 38.1 lb./ac.
S.E. of body of S × V or S × M table = 66.0 lb./ac.
S.E. of body of V × M table = 53.9 lb./ac.

Paddy
   (i) 2917 lb./ac. (ii) 470.3 lb./ac. (iii) Interaction V × M is significant. (iv) Av. yield of grain in lb./ac.

\[ E_1 = 3111 \text{ lb./ac. and } E_2 = 2955 \text{ lb./ac.} \]

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>V1</th>
<th>V2</th>
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<td>2842</td>
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<tr>
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<td>2918</td>
<td>2923</td>
<td>2898</td>
<td>2939</td>
<td>2856</td>
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<td>2862</td>
<td>2898</td>
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</table>
Crop > Jute, Paddy; Pulse.
Type > CMV.

Object: To study the possibility of triple cropping with Jute, Paddy and Pulse.

1. BASAL CONDITIONS:
   (i) (a) Jute—Paddy—Pulse. (b) (c) As per treatments. (ii) (a) Sandy loam. (b) As per treatments. (iii) As per treatments. Jute: As per treatments. Paddy: patna—23 and Pulse: khasari. (iv) (a) 18.1.1959, paddy on 25.11.1959 and Pulse: 23.3.1960.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 56(30) on page 2.

   5. RESULTS:

Jute
(i) 1752 lb/ac. (ii) 221.1 lb/ac. (iii) Main effects of S and V are highly significant. Interaction S×V is significant. (iv) Av. yield of fibre in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>V1</th>
<th>V2</th>
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<td>2043</td>
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<tr>
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<td>1807</td>
<td>1996</td>
<td>1572</td>
<td>1792</td>
<td>1618</td>
<td>1966</td>
</tr>
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<td></td>
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<tr>
<td>V2</td>
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<td>2717</td>
<td>192</td>
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</tbody>
</table>
### Paddy

(i) **2419** lb./ac.  (ii) **209.2** lb./ac.  (iii) None of the effects is significant.  

<table>
<thead>
<tr>
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<th>S1</th>
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<th>S3</th>
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<th>V1</th>
<th>V2</th>
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<td>2394</td>
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</tr>
<tr>
<td>V2</td>
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<td>2614</td>
<td>2377</td>
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</tbody>
</table>

### Khasari

(i) **695** lb./ac.  (ii) **115.7** lb./ac.  (iii) Interaction S X M alone is highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>V1</th>
<th>V2</th>
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<td>587</td>
<td>707</td>
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<td>712</td>
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<td>747</td>
<td>683</td>
<td>688</td>
<td>678</td>
</tr>
<tr>
<td>Mean</td>
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<td>694</td>
<td>607</td>
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<th>S3</th>
<th>Mean</th>
<th>V1</th>
<th>V2</th>
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<tbody>
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<td>710</td>
<td>660</td>
<td>693</td>
<td>695</td>
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<tr>
<td>V2</td>
<td>763</td>
<td>649</td>
<td>674</td>
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Central Arid Zone Research Institute
JODHPUR
1. Name of the experimental station: Central Arid Zone Research Institute, Jodhpur.
2. Tehsil of Taluka: Jodhpur.
3. District: Jodhpur.
4. Address: Central Arid Zone Research Institute, Jodhpur.
5. Year of establishment: N.A.
6. Latitude 28.18°N
   Longitude 73.01°E
   Altitude 224.33 metres.
7. Whether research, multiplication or demonstration farm: Research Farm
8. Whether State, University or private Indian Council of Agricultural Research, New Delhi.
9. Programme of research: To carry out research on the proper utilization and improvement of existing resources of the region in the fields of Agronomy, Silviculture, Agrostology and range management.
10. Normal cropping pattern: Crops of bajra, guar, moong, moth, lobia, groundnut, and castor are grown under rainfed conditions.
11. Type of tract it represents: Desert soils of Western Rajasthan.
12. A general description of the topography of the experimental area: Areas vary from flat to undulating, where experimental work is carried out under different topographical and edaphic conditions.
13. Soils:
   (a) Broad soil types: Desert soil (transported alluvial rhyolite and sandstone rock origin).
   (b) Chemical analysis and
   (c) Mechanical analysis: As given below:

   **Profile description:**
   - 0-15 cm. Brown (10YR 5/3 dry) loamy sand, single grain, dry and loose, non-calcareous, abundant roots present, rapid permeability, diffused boundary.
   - 15-38 cm. Dark brown (10YR 3/3 dry) sandy loam, very weak granular structure, dry and loose, moist and friable, non-calcareous, abundant roots, rapid permeability, diffused boundary.
   - 38-94 cm. Dark brown (10YR 3/3 dry) sandy loam, very weak sub angular blocky structure, dry and loose, moist and friable, slightly more compact than above, non-calcareous, fewer roots present, rapid permeability, diffused boundary.
94-112 cm. Dark brown (IOYR 3/ dry) sandy loam, very weak sub angular blocky structure, dry and loose, moist and friable, slight effervescence with HCl, very few roots, fairly rapid permeability, diffused boundary.

112-127 cm. Dark brown (IOYR 3/ dry) loamy sand, very weak sub angular blocky structure, dry and slightly hard, moist and friable, plenty of lime concretious present giving violent effervescence with HCl, more compact than above, clear boundary.

127 cm. above Concretionery zone of rhyolite and sand stone fragment coated with calcium carbonate, mixed with some soil.

<table>
<thead>
<tr>
<th>Depth in cm.</th>
<th>Mechanical composition %</th>
<th>CaCO₂ %</th>
<th>pH 1:2.5 (in water)</th>
<th>Organic Carbon Eq %</th>
<th>Moisture %</th>
<th>Electric conductivity millimhos/cm.</th>
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<td>Fine sand</td>
<td>Silt</td>
<td>Clay</td>
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<tr>
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<td>11.6</td>
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<td>7.7</td>
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<td>94-112</td>
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<td>6.5</td>
<td>14.7</td>
<td>0.1</td>
<td>7.8</td>
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<tr>
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<td>42.7</td>
<td>11.0</td>
<td>7.9</td>
<td>0.2</td>
<td>7.9</td>
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</table>

14. Normal rainfall in mm: 

<table>
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<tbody>
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<td>125.4</td>
<td>58.1</td>
<td>6.2</td>
<td>2.3</td>
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<td>2.8</td>
<td>3.1</td>
<td>9.7</td>
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</table>

(Average rainfall data is based on the period 1901-1960).

15. Whether irrigation facilities available: Nil. Year from which the facilities were made available.

16. Whether any proper drainage system exists: Nil.
Crop: Bajra (Kharif).
Site: Central Arid Zone Res. Instt., Jodhpur.

Object: To study the effect of various depths of seed placement on germination, growth and yield of Bajra in Arid Zone soils.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jodhpur. (iii) 2.8.1959. (iv) (a) 2 ploughings. (b) As per treatments. (c) 3 lb./ac. (d) Row to row 1'. (e) N.A. (v) 10 lb./ac. of N as F.Y.M. (vi) R.S.K. (vii) Unirrigated. (viii) 4 weedings. (ix) N.A. (x) 26.10.1959.

2. TREATMENTS:
   5 depths of seed placement: D1 = 2", D2 = 3", D3 = 4", D4 = 5" and D5 = 6" soil depth.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 20' x 10'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1959-1962. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1406 lb./ac. (ii) 195.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

   Treatment | D1 | D2 | D3 | D4 | D5
   -----------|----|----|----|----|----
   Av. yield  | 1391| 1486| 1405| 1369| 1380
   S.E./mean = 79.6 lb./ac.

---

Crop: Bajra (Kharif).
Site: Central Arid Zone Res. Instt., Jodhpur.

Object: To study the effect of different seed rates, spacings and levels of F.Y.M. on Bajra.

1. BASAL CONDITIONS:
   (i) (a) to (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jodhpur. (iii) 16.7.1958. (iv) (a) 2 ploughings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (vi) Nil. (v) R.S.K. (vii) Unirrigated. (viii) 4 weedings. (ix) N.A. (x) 25 and 26.10.1958.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 seed rates: R1 = 3, R2 = 6 and R3 = 9 lb./ac.
   (2) 3 row spacings: S1 = 12", S2 = 18" and S3 = 24".
   (3) 3 levels of F.Y.M.: F0 = 0, F1 = 1000 and F2 = 2000 lb./ac.

3. DESIGN:
   (i) 3² confd. (ii) (a) 9 plots/block and 3 blocks/repetition. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/4 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958-1961. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 528 lb./ac. (ii) 283.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.
Crop = Bajra (Kharif).

Site = Central Arid Zone Res. Inst., Jodhpur.

Type = 'GM'.

Object = To study the effect of different seed rates, spacings and levels of F.Y.M. on Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jodhpur. (iii) 14.7.1959. (iv) (a) 2 ploughings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) R.S.K. (vii) Unirrigated. (viii) 4 weedings. (ix) N.A. (x) 20 and 21.10.1959.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 seed rates: \( R_1 = 41, \ R_2 = 6 \) and \( R_3 = 71 \) lb./ac.
   (2) 3 row spacings: \( S_1 = 1', S_2 = 1\frac{1}{2}' \) and \( S_3 = 2' \).
   (3) 3 levels of F.Y.M.: \( F_0 = \) Nil., \( F_1 = 2000 \) and \( F_2 = 4000 \) lb./ac.

3. DESIGN:
   (i) 3 rep. (ii) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 3 rep. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—1961. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 929 lb./ac. (ii) 361.5 lb./ac. (iii) Only main effect of N is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>Mean</th>
<th>( F_0 )</th>
<th>( F_1 )</th>
<th>( F_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R_1 )</td>
<td>869</td>
<td>938</td>
<td>831</td>
<td>879</td>
<td>636</td>
<td>1060</td>
<td>542</td>
</tr>
<tr>
<td>( R_2 )</td>
<td>863</td>
<td>1124</td>
<td>876</td>
<td>954</td>
<td>771</td>
<td>1046</td>
<td>1045</td>
</tr>
<tr>
<td>( R_3 )</td>
<td>1112</td>
<td>897</td>
<td>853</td>
<td>954</td>
<td>821</td>
<td>987</td>
<td>1055</td>
</tr>
<tr>
<td>Mean</td>
<td>948</td>
<td>986</td>
<td>853</td>
<td>929</td>
<td>743</td>
<td>1031</td>
<td>1014</td>
</tr>
<tr>
<td>( F_0 )</td>
<td>778</td>
<td>818</td>
<td>632</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>( F_1 )</td>
<td>1002</td>
<td>1067</td>
<td>1024</td>
<td></td>
<td></td>
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<tr>
<td>( F_2 )</td>
<td>1064</td>
<td>1074</td>
<td>904</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 85.2 lb./ac.
S.E. of body of any table = 147.6 lb./ac.
Crop: Mung (Khairf).
Site: Central Arid Zone Res. Inst., Jodhpur.

Ref: C.A.Z.R.I. 59(2).
Type: M'.

Object:—To find out the optimum level of P for obtaining maximum yield of Mung.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jodhpur. (iii) 10.7.1959. (iv) (a) 2 ploughings. (b) Drilling. (d) Row to row 1'. (e) N.A. (v) N.A. (vi) R.S.—4. (vii) Unirrigated. (viii) 4 weedings. (ix) N.A. (x) 10.10.1959.

2. TREATMENTS:
   4 levels of P.O as Super: P0 = 0, P1 = 20, P2 = 40 and P3 = 60 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 4.2 lb./ac. (ii) 109.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

   Treatment   P0   P1   P2   P3
   Av. yield   548  503  468  450
   S.E./mean = 44.7 lb./ac.

Crop: Mung (Khairf).
Site: Central Arid Zone Res. Inst., Pali.

Ref: C.A.Z.R.I. 59(2).
Type: C'.

Object:—To find out the optimum seed rate of Mung for the Arid tract and frequencies of weeding for proper conservation of soil moisture.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Pali. (iii) July, 1959. (iv) (a) 2 ploughings. (b) Drilling. (c) As per treatments. (d) Row to row 1'. (e) N.A. (v) 18 lb./ac. of N as F.Y.M. (vi) Local. (vii) Unirrigated. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 seed rates: S1 = 8, S2 = 10 and S3 = 12 lb./ac.

   Sub-plot treatments:
   3 levels of weeding: W0 = Control (no weeding), W1 = 1 weeding after 2 weeks of sowing and W2 = 2 weedings after 4 weeks of sowing.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 50' x 25'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1919—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 830 lb./ac. (ii) (a) 43.8 lb./ac. (b) 34.6 lb./ac. (iii) Main effect of W alone is significant. (iv) Av. yield of grain in lb./ac.
Crop: Cowpea (Kharif).

Site: Central Arid Zone Res. Instt., Jodhpur.

Object: To find out the optimum level of P for obtaining maximum yield of Cowpea.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jodhpur. (iii) 10.7.1959. (iv) (a) 2 ploughings. (b) Drilling. (c) 8 lb/ac. (d) Row to row 1’. (e) N.A. (v) and (vi) N.A. (vii) Unirrigoted. (viii) 4 weedings. (ix) N.A. (x) October, 1959.

2. TREATMENTS:
   4 levels of P₂O₅ as Super: P₀=0, P₁=20, P₂=40 and P₃=60 lb/ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of grain, (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 86 lb/ac. (ii) 42.3 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>81</td>
<td>99</td>
<td>65</td>
<td>97</td>
</tr>
</tbody>
</table>

S.E./mean = 17.3 lb/ac.

Crop: Moth (Kharif).

Site: Central Arid Zone Res. Instt., Jodhpur.

Object: To find out the optimum levels of P for obtaining maximum yield of Moth.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jodhpur. (iii) 10.7.1959. (iv) (a) 2 ploughings. (b) Drilling. (c) 8 lb/ac. (d) Row to row 1’. (e) N.A. (v) and (vi) N.A. (vii) Unirrigoted. (viii) 4 weedings. (ix) N.A. (x) October, 1959.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 59(4) above.
4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 408 lb./ac. (ii) 79.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>369</td>
<td>400</td>
<td>432</td>
<td>430</td>
</tr>
<tr>
<td>S.E./mean =</td>
<td>32.4 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Crop: Guar (Kharif).

Site: Central Arid Zone Res. Inst., Jodhpur.

Type: 'M'.

Object: To find out the optimum level of P for obtaining maximum yield of Guar.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jodhpur. (iii) 16.7.1959. (iv) (a) 2 ploughings. (b) Drilling. (c) 8 lb./ac. (d) Row to row 1'. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 4 weedings. (ix) N.A. (x) October, 1959.

2. TREATMENTS:
4 levels of P₂O₅ as Super: P₀ = 0, P₁ = 20, P₂ = 40 and P₃ = 60 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 588 lb./ac. (ii) 106.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>585</td>
<td>532</td>
<td>604</td>
<td>632</td>
</tr>
<tr>
<td>S.E./mean =</td>
<td>43.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Crop: Groundnut (Kharif).

Site: Central Arid Zone Res. Inst., Jodhpur.

Type: 'M'.

Object: To find out the optimum level of P for obtaining maximum yield of Groundnut.

1. BASAL CONDITIONS:
(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Jodhpur. (iii) 10.7.1959. (iv) (a) 2 ploughings. (b) Drilling. (c) 8 lb./ac. (d) Row to row 1'. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 4 weedings. (ix) N.A. (x) October, 1959.

2. TREATMENTS:
4 levels of P₂O₅ as Super: P₀ = 0, P₁ = 20, P₂ = 40 and P₃ = 60 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) to (vii) N.A.
5. RESULTS:

(i) 440 lb./ac.
(ii) 280 lb./ac.
(iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$P_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>421</td>
<td>445</td>
<td>412</td>
<td>517</td>
</tr>
</tbody>
</table>

S.E./mean = 31.5 lb./ac.

Crop :- Til (Kharif).

Site :- Central Arid Zone Res. Instit. Res. Farm, Pali.

Object :- To study the effect of different levels of F.Y.M. on the yield of Til.

1. BASAL CONDITIONS:

(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Pali. (iii) 7.8.1959. (iv) (a) 2 ploughings. (b) Broadcast. (c) 3 lb./ac. (d) Row to row 1'. (e) N.A. (v) 18 lb./ac. of N as F.Y.M. (vi) Local (white). (vii) Unirrigated. (viii) 4 weedicings. (ix) N.A. (x) 4.10.1959.

2. TREATMENTS:

5 levels of N as F.Y.M.: $N_0=0$, $N_1=10$, $N_2=20$, $N_3=30$ and $N_4=40$ lb./ac.

3. DESIGN:

(i) R.B.D. (ii) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 50' x 9'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS:

(i) 321 lb./ac. (ii) 88.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_0$</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$N_3$</th>
<th>$N_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>225</td>
<td>327</td>
<td>332</td>
<td>351</td>
<td>371</td>
</tr>
</tbody>
</table>

S.E./mean = 44.4 lb./ac.
Indian Agricultural Research Institute
NEW DELHI
1. Name of the experimental station: Indian Agricultural Research Institute (Division of Agronomy).

2. Tehsil or Taluka: 

3. District: 

4. Address: Indian Agricultural Research Institute, New Delhi.

5. Year of establishment: 1904.

6. Latitude: 28.4°N
   Longitude: 77.1°E
   Altitude: 227 m. above M.S.L.

7. Whether research, multiplication or demonstration farm: Research farm.

8. Whether State, University or private managed: The station is I.A.R.I. managed which has got the status of a University.

9. Programme of research: To conduct agronomical research on the crops of North India.


11. Type of tract it represents: It is representative of the areas comprising of Punjab, Hariyana, western districts of U.P. and adjoining area of Rajasthan.

12. General description of the topography of the experimental area: The experimental station is located in the semi-arid, sub-tropical climatic zone, having extremely hot and dry summers and very severe winters with occasional frosts in December-January. The soil of the farm is of Jamuna— alluvial origin having pH of 7.9 to 8.5 or above and has abundant supplies of calcium carbonate in the surface layer and with occasional impregnation of clay and/or kankar layer at depths of 60-100 cm. with deep alluvial soils of Gangetic origin. The area is surrounded with the ranges of Shiwalik hills and is virtually located in the midst of these ranges and thus getting very badly water logged during monsoons and has very shallow water table varying from 2 to 5 ft. in most of the experimental fields even during "rabi" season. The saline area also constitute a sizeable portion of the farm.

13. Soils:
   (a) Broad soil types:
      (i) Depth:
      (ii) Colour:
      (iii) Structure:
   (b) Chemical analysis:
      Sandy loam to clay-loam
      Very deep (depth ranging more than twenty ft. or so).
      Light brown to dark brown.
      Single grained to "loody" friable.
      pH: 7.99 to 8.51; CaCO₃: 1.21 to 11.83%; organic nitrogen: .015 to .027%; organic carbon: .07 to .20%; C/N: 4.8 to 8.0.
(c) Mechanical analysis:

<table>
<thead>
<tr>
<th></th>
<th>Sand</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50-60%</td>
<td>12.5%</td>
<td>22.8%</td>
</tr>
</tbody>
</table>

14. Normal average rainfall in inches:

<table>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>39.3</td>
<td>252.7</td>
<td>265.8</td>
<td>150.9</td>
<td>19.1</td>
<td>4.4</td>
<td>6.9</td>
<td>21.2</td>
<td>11.1</td>
<td>13.6</td>
<td>3.8</td>
<td>15.5</td>
<td>67.2</td>
</tr>
</tbody>
</table>

(The figures are based on the period of last 10 years)

15. Irrigation facilities available:

- Canal and tube wells; N.A.

16. Whether any proper drainage system exists:

Well laid out drainage system exists on the farm.
Crop: Paddy (Kharij).
Site: Botanical Sub-Stn., Pusa (Bihar).
Ref: I.A.R.I. 54(1).
Type: 'M'.

Object: To determine the nutritional requirements of the soil for Paddy.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 28.7.1954. (iv) (a) Puddling. (b) to (x) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 21 to 23.12.1954.

2. TREATMENTS:
   11 manural treatments: T0=Control (no manure), T1=40 lb./ac. of N+60 lb./ac. of K2O applied as soil application, T2=T1+50 lb./ac. of Zn as soil application and 5 lb./ac. of Zn as spray, T3=T1+50 lb./ac. of Mn as soil application and 5 lb./ac. of Fe as spray, T4=T1+100 lb./ac. of Fe as soil application and 5 lb./ac. of Mn as soil application and 10 lb./ac. of Mg as soil application, T5=T1+15 lb./ac. of Borax as soil application and 3 lb./ac. of Borax as spray, T6=T1+2 lb./ac. of MgO as soil application and 1 lb./ac. of Fe as spray, T7=T1+all micro-nutrients only (no fertilizers).

3. DESIGN:
   (i) R.B.D. (ii) (a) 48.5'x9'. (b) 46.5'x7'. (iii) (iv) 1'x1'. (v) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) to (vii) N.A.

5. RESULTS:
   (i) 2863 lb./ac. (ii) 401.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Avg. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg yield</td>
<td>2082</td>
<td>3018</td>
<td>3026</td>
<td>3140</td>
<td>3103</td>
<td>3119</td>
<td>2826</td>
<td>2918</td>
<td>3060</td>
<td>2919</td>
<td></td>
</tr>
<tr>
<td>S.E.(mean)</td>
<td>200.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. RESULTS:
(i) 5332 lb./ac.  (ii) (a) 1389.6 lb./ac.  (b) 556.0 lb./ac.  (c) 581.2 lb./ac.  (iii) Main effects of M and R are highly significant and main effects of S and N are significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>M1</th>
<th>M2</th>
<th>R1</th>
<th>R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>5823</td>
<td>5178</td>
<td>4904</td>
<td>4807</td>
<td>5490</td>
<td>5700</td>
<td>5037</td>
<td>5627</td>
<td>5581</td>
<td>5083</td>
</tr>
</tbody>
</table>

S.E. of S or N marginal mean = 231.6 lb./ac.
S.E. of M marginal mean = 75.7 lb./ac.
S.E. of R marginal mean = 51.9 lb./ac.

Crop: Paddy (Kharif).

Object: To determine the efficiency of methods of applying varying levels of nitrogen to Paddy in conjunction with spacing and ridging of Paddy plants.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 14 to 16.7.1958.  (iv) (a) Grubbing twice and 2 ploughings.  (b) Transplanted.  (c) N.A.  (d) As per treatments.  (e) N.A.  (v) 40 lb./ac. of P_{2}O_{5}+20 C.L./ac. of F.Y.M.  (vi) N.A.  (vii) Irrigated.  (viii) 2 weedings and ridging up of plants.  (ix) N.A.  (x) 28 to 31.10.1958.

2. TREATMENTS:
Same as in exp. no. 57(1) on page 291.

3. DESIGN:
(i) Split-plot.  (ii) (a) 9 main-plots/replication; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot.  (b) N.A.  (iii) 3.  (iv) (a) 25.5' x 13'.  (b) 19' x 11'.  (c) 3.25' x 1.0'.  (v) Yes.

4. GENERAL:
(i) Good growth. The unridged crop lodged heavily from 24 to 26.9.1958.  (ii) Serious attack of Gundhi bug controlled by dusting 5% R.H.C.  (iii) Yield of grain.  (iv) 1957—N.A.  (b) N.A.  (c) No.  (d) and (vii) N.A.  (vii) Two-way tables N.A.

5. RESULTS:
(i) 6031 lb./ac.  (ii) (a) 562.8 lb./ac.  (b) 703.5 lb./ac.  (c) 255.7 lb./ac.  (iii) Main effects of S, N, M and R are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>M1</th>
<th>M2</th>
<th>R1</th>
<th>R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>6693</td>
<td>6045</td>
<td>5354</td>
<td>5418</td>
<td>5907</td>
<td>6768</td>
<td>5082</td>
<td>6179</td>
<td>6254</td>
<td>5803</td>
</tr>
</tbody>
</table>

S.E. of S or N marginal mean = 93.8 lb./ac.
S.E. of M marginal mean = 96.0 lb./ac.
S.E. of R marginal mean = 34.8 lb./ac.

Crop: Wheat (Rabi).

Object: To study the effect of compost on humus formation and its effect on Wheat yield in Maize—Wheat rotation.

1. BASAL CONDITIONS:
(i) (a) Maize—Wheat.  (b) Maize.  (c) As per treatments.  (ii) (a) and (b) N.A.  (iii) 13.11.1954.  (iv) and (v) Nil.  (vi) N.A.  (vii) Irrigated.  (viii) 4 weedings, 1 roguing and 1 bedaling.  (ix) N.A.  (x) 9.4.1955.
2. TREATMENTS:

All combinations of (1) and (2) + 3 extra treatments

(1) 3 types of compost: C₁ = Plastered trench compost, C₂ = Over ground heap compost and C₃ = Exposed pit compost.

(2) 3 levels of N: N₁ = 40, N₂ = 80 and N₃ = 120 lb./ac.

Extra treatments: E₀ = Control, E₁ = 20 lb./ac. of N as A/S to maize + 20 lb./ac. of N as A/S to wheat and E₂ = 40 lb./ac. of N as A/S to maize + 40 lb./ac. of N as A/S to wheat.

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 24.66' × 30'. (b) 22.66' × 28'. (v) 1' × 1'. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952-1954. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1150 lb./ac. (ii) 168.8 lb./ac. (iii) Main effects of N, E and 'E vs. others' are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
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S.E. of C or N marginal mean = 39.8 lb./ac.
S.E. of body of table or E mean = 68.6 lb./ac.

Crop: Wheat (Rabi).
Type: 'M'.

Object: To study the effect of organic and inorganic manures on the yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil, (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 21.11.1954. (iv) (a) 2 ploughings and 3 harrowings. (b) to (e) N.A. (v) N.A. (vi) N.P.—710. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 13 to 16.4.1955.

2. TREATMENTS:

Main-plot treatments:

4 levels of organic manure: M₀ = Control, M₁ = Gaur (G.M.), M₂ = 60 lb./ac. of N as Castor cake and M₃ = 60 lb./ac. of N as F.Y.M.

Sub-plot treatments:

5 levels of inorganic manure: L₀ = Control, L₁ = 40 lb./ac. of N as A/S, L₂ = 80 lb./ac. of P₂O₅ as Super, L₃ = L₁ + L₂ and L₄ = L₁ + L₂ + 60 lb./ac. of K₂O as Pot. Sul.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/repetition; 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 5' × 24'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. In some plots growth was poor. (ii) Attack of white ants and rats. (iii) Yield of grain. (iv) (a) 1950–N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1599 lb./ac. (ii) (a) 466.1 lb./ac. (b) 186.4 lb./ac. (iii) Only interaction M × L is significant. (iv) Av. yield of grain in lb./ac.
LO Lt Lo Lt  Lo Lt

294

Mean

1432
1655
1397
1350
1569

S.E. of difference of two
1. M marginal means = 120.3 lb./ac.
2. L marginal means = 33.8 lb./ac.
3. L means at the same level of M = 107.6 lb./ac.
4. M means at the same level of L = 154.8 lb./ac.

**Crop:** Wheat (Rabi).
**Site:** Indian Agri. Res. Instt., New Delhi.

Object:—To study the effect of wheat straw buried with and without artificial on the yield of wheat.

1. **BASAL CONDITIONS:**
   (i) (a) and (c) N.A. (ii) (a) and (b) N.A. (iii) 3.11.1954. (iv) (a) 3 ploughings and 2 discings. (b) to (e) N.A. (v) Nil. (vi) N.P.—700. (vii) Irrigated. (viii) 2 weedings and 1 roning. (ix) N.A. (x) 11.4.1955.

2. **TREATMENTS:**
   Main-plot treatments: 3 levels of straw: $S_0=0$, $S_1=20$ and $S_2=30$ mls./ac.
   Sub-plot treatments: 5 manurial treatments: $M_0=Control$, $M_1=20$ lb./ac. of N as A/S, $M_2=40$ lb./ac. of N as A/S, $M_3=60$ lb./ac. of N as A/S and $M_4=40$ lb./ac. of N as A/S + 40 lb./ac. of P$_2$O$_5$ as Super + 40 lb./ac. of K$_2$O as Pot. Sul.

3. **DESIGN:**
   (i) Split-plot. (ii) (a) 3 main-plots replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 37.5' x 29', (b) 35.5' x 27'. (v) 1' x 1'. (vi) Yes.

4. **GENERAL:**
   (i) Normal. (ii) Nil. (iii) Yiel of grain. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 1905 lb./ac. (ii) 236.9 lb./ac. (b) 231.3 lb./ac. (iii) Main effect of $M$ alone is highly significant. (iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. S marginal means $= 90.5$ lb./ac.
2. M marginal means $= 127.9$ lb./ac.
3. M means at the same level of S $= 222.9$ lb./ac.
4. S means at the same level of M $= 210.0$ lb./ac.

Ref: I.A.R.I. 54(4). Type: 'M'.
Crop: Wheat (Rabi).


Object: To find out the optimum dose of N and P for Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) November, 1954. (iv) and (v) N.A. (vi) N.P.—718. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1955.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 2 levels of \( P_O^2 \) as Super: \( P_O = 0 \) and \( P_O = 60 \) lb./ac.
   (2) 6 levels of \( N \) as A/S: \( N_0 = 0, N_1 = 20, N_2 = 40, N_3 = 60, N_4 = 80 \) and \( N_5 = 100 \) lb./ac.

3. DESIGN:
   (i) Factor in R.B.D. (ii) (a) 41.5' x 19.5'. (b) 39' x 17'. (iii) 8. (iv) (a) 6 ploughings. (b) to (e) N.A. (v) and (vi) N.A. (vii) 8. (viii) and (ix) N.A. (x) March, 1955.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—N.A. (modified in 1954). (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 2586 lb./ac. (ii) 320.6 lb./ac. (iii) Main effect of \( N \) alone is highly significant. (iv) Av. yield of grain in lb./ac.

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<th>( N_2 )</th>
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S.E. of P marginal mean — 46.3 lb./ac.
S.E. of N marginal mean — 80.2 lb./ac.
S.E. of body of table — 113.4 lb./ac.
Object:—To study the effect of different sources of N applied at different times on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) Fallow.  (c) Nil.  (ii) (a) Sandy loam to loam.  (b) N.A.  (iii) 22.11.1956.  (iv) (a) 3 discings and 2 grubings.  (b) to (e) N.A.  (v) Nil.  (vi) N.P.-710 (medium).  (vii) Irrigated.  (viii) Nil.  (ix) 15.59'.  (x) 2.5.1957.

2. TREATMENTS:
   Same as in exp. no. 54(6) on page 295.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) N.A.  (iii) 4.  (iv) (a) 54.5' x 20'.  (b) 45.3' x 16'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Hail storm occurred in early milk stage and damaged the crop considerably.  (ii) Nil.  (iii) Population count, height of main shoot and tiller at fortnightly interval of 10 plants and ear head study.  (iv) (a) 1953—N.A.  (b) No.  (c) Nil.  (v) (a) 8 centres under Indo—American Agreement—'Fertilizer use project'.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 583 lb./ac.  (ii) 76.6 lb./ac.  (iii) Main effect of S is highly significant and interaction 'control vs. others' is significant.  (iv) Av. yield of grain in lb./ac.

Control = 499 lb./ac.

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<th>S3</th>
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<td>606</td>
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<td><strong>Mean</strong></td>
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<td>592</td>
<td>597</td>
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</table>

S.E. of T marginal mean = 22.1 lb./ac.
S.E. of S marginal mean = 27.1 lb./ac.
S.E. of body of table or control mean = 38.2 lb./ac.
1. **BASAL CONDITIONS**:
   (i) to (x) N.A.

2. **TREATMENTS**:
   Same as in expt. no. 54(6) on page 295.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 32.5'×27'. (v) N.A. (vi) Yes.

4. **GENERAL**:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) to (viii) Nil.

5. **RESULTS**:
   (i) 1792 lb./ac (ii) 361.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

   Control = 1837 lb./ac.

<table>
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<td>T2</td>
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<td>1921</td>
<td>1784</td>
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</table>

S.E. of T marginal mean = 104.3 lb./ac.
S.E. of S marginal mean = 127.8 lb./ac.
S.E. of body of table or control mean = 180.7 lb./ac.

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**Crop**: Wheat (Rabi).  
**Site**: Indian Agri. Res. Instt., New Delhi.  
**Type**: 'M'.  
Ref: I.A.R.I. 54(7).

Object:—To determine the optimum dose and time of application of F.Y.M. to Wheat crop.

1. **BASAL CONDITIONS**:
   (i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 12.11.1954. (iv) (a) 2 ploughings. (b) Tractor sowing. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 5 weedings. (ix) N.A. (x) 14 to 19.4.1955.

2. **TREATMENTS**:
   Main-plot treatments:
   All combinations of (I) and (2)+control
   4 times of application of F.Y.M.: $T_1 = 3$ months, $T_2 = 2$ months, $T_3 = 1$ month and $T_4 = 1$ week before sowing of Wheat.
   3 levels of F.Y.M.: $F_1 = 2$, $F_2 = 5$ and $F_3 = 10$ tons/ac.
   Sub-plot treatments:
   2 levels of N as A/S: $N_0 = 0$ and $N_1 = 10$ lb./ac.

3. **DESIGN**:
   (i) Split-plot. (ii) (a) 13 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 32’×18’. (v) N.A. (vi) Yes.

4. **GENERAL**:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1952—contd. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. **RESULTS**:
   (i) 1229 lb./ac. (ii) (a) 516.1 lb./ac. (b) 231.4 lb./ac. (iii) Main effect of F and 'control vs. others' are significant. (iv) Av. yield of grain in lb./ac.
Control \( (N_0 + N_1) \) = 971 lb./ac.

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<td>1239</td>
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<td>1237</td>
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</table>

\[ \text{S.E. of difference of two} \]

1. F marginal means \( = 79.0 \text{ lb./ac.} \)
2. T marginal means \( = 91.2 \text{ lb./ac.} \)
3. N marginal means \( = 47.2 \text{ lb./ac.} \)
4. N means at the same level of D \( = 81.8 \text{ lb./ac.} \)
5. F means at the same level of N \( = 97.9 \text{ lb./ac.} \)
6. N means at the same level of T \( = 94.5 \text{ lb./ac.} \)
7. T means at the same level of N \( = 113.1 \text{ lb./ac.} \)
8. S.E. of body of \( F \times T \) table or control mean \( = 111.8 \text{ lb./ac.} \)

Crop: Wheat (\textit{Rabi}).
Type: \textit{M}'.

Object: To determine the optimum dose and time of application of \( F \).Y.M. to Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Maize - Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 17.11.1955. (iv) (a) 2 ploughings, 1 beaming and 1 discing. (b) N.A. (c) 76 lb./ac. (d) and (e) N.A. (v) Nil. (vi) N.P.-710. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 20 and 21.4.1955.

2. TREATMENTS:
   Same as in expt. no. 54(7) on page 297.

3. DESIGN:
   (i) Split-plot. (ii) (a) 13 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 34'X20', (b) 31'X16'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. Severe lodging took place due to heavy winds. (ii) Brown rust. (iii) Yield of grain. (iv) (a) 1952-continued. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 2269 lb./ac. (ii) (a) 442.6 lb./ac. (b) 390.8 lb./ac. (iii) Main effect of \( F \) alone is significant. (iv) Av. yield of grain in lb./ac.
   Control \( (N_0 + N_1) \) = 2028 lb./ac.

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\[ \text{F, T marginal means} \]
Crop: Wheat (Rabi).


Object: To determine the optimum dose and time of application of F.Y.M. to Wheat crop.

1. BASEL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) (a) and (b) N.A. (iii) 15.11.1956. (iv) (a) 3 ploughings and 1 tractor discing. (b) to (c) N.A. (v) N.A. (vi) N.P.—7/10. (vii) Irrigated. (viii) 2 hand hoeings. (ix) N.A. (x) 28 to 30.4.1957.

2. TREATMENTS:
   Same as in exp. no. 64(7) on page 297.

3. DESIGN:
   (i) Split-plot. (ii) (a) 13 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' x 34', (b) 18' x 32', (v) 1' x 1'. (vi) Yes.

4. GENERAL:
   (i) Good, crop damaged due to hail storm. (ii) No. (iii) Yield of grain. (iv) (a) 1952—contd. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 725 lb./ac. (ii) (a) 264.7 lb./ac. (b) 152.0 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

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</tr>
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<td>T3</td>
<td>676</td>
<td>703</td>
<td>809</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. T marginal means = 76.4 lb./ac. 5. T means at the same level of N = 88.1 lb./ac.
2. F marginal means = 66.2 lb./ac. 6. N means at the same level of F = 53.7 lb./ac.
3. N marginal means = 76.3 lb./ac. 7. F means at the same level of N = 95.6 lb./ac.
4. N means at the same level of T = 62.1 lb./ac. S.E. of body of T x F table or control mean = 53.7 lb./ac.
1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 30.11.1957. (iv) (a) 5 grabber discings and 1 grubbing. (b) to (g) N.A. (x) Nil. (y) N.P. - 718. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 9 to 13.4.1958.

2. TREATMENTS:
Same as in expt. no. 54(7) on page 297.

3. DESIGN:
(i) Split-plot. (ii) (a) 13 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 34' x 20'. (b) 32' x 18'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952 - control. (b) Yes. (c) N.A. (v) at 10 lb./ac. (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1182 lb./ac. (ii) (a) 312.3 lb./ac. (b) 135.4 lb./ac. (iii) Main effect of N is highly significant and interaction N x T x F and 'N x control vs. others' are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control (N&lt;sub&gt;4&lt;/sub&gt;+N&lt;sub&gt;3&lt;/sub&gt;)</th>
<th>1042 lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N&lt;sub&gt;0&lt;/sub&gt;</td>
<td>1105</td>
</tr>
<tr>
<td>N&lt;sub&gt;1&lt;/sub&gt;</td>
<td>1127</td>
</tr>
<tr>
<td>Mean</td>
<td>1190</td>
</tr>
<tr>
<td>F&lt;sub&gt;1&lt;/sub&gt;</td>
<td>1108</td>
</tr>
<tr>
<td>F&lt;sub&gt;2&lt;/sub&gt;</td>
<td>1211</td>
</tr>
<tr>
<td>F&lt;sub&gt;3&lt;/sub&gt;</td>
<td>1251</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. T marginal means = 50.2 lb./ac. 5. T means at the same level of N = 98.3 lb./ac.
2. F marginal means = 78.1 lb./ac. 6. N means at the same level of F = 47.9 lb./ac.
3. N marginal means = 27.6 lb./ac. 7. F means at the same level of N = 85.1 lb./ac.
4. N means at the same level of T = 55.3 lb./ac. S.E. of body of T x F table or control mean = 110.4 lb./ac.

Crop: Wheat (Rabi).
Ref: I.A.R.I. 54(8).
Type: ‘M’. Object:To study the relative efficiency of different commercial nitrogenous fertilizers, their doses and time of application on Wheat.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 30 and 31.10.1954. (iv) (a) 1 grabber, 2 sowing and 1 discing. (b) to (e) N.A. (v) N.A. (vi) N.P. - 718. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 23 to 27.4.1955.

2. TREATMENTS:
Main-plot treatments:
- 4 sources of N: S<sub>1</sub> = A/S, S<sub>2</sub> = A/N, S<sub>3</sub> = C/N and S<sub>4</sub> = Urea.

Sub-plot treatments:
All combinations of (1) and (2) + 2 extra treatments
(i) 2 doses of fertilizers: F<sub>1</sub> = 20 lb./ac. of N<sub>60</sub> and F<sub>2</sub> = 40 lb./ac. of N<sub>60</sub>.
(ii) 7 times and methods of application of N: T<sub>1</sub> = Full at sowing, T<sub>2</sub> = Full four weeks after sowing, T<sub>3</sub> = Full 8 weeks after sowing, T<sub>4</sub> = Full at sowing+ after 4 weeks of sowing, T<sub>5</sub> = Full at sowing+ after 8 weeks of sowing, T<sub>6</sub> = Full after 4 weeks of sowing+ after 8 weeks of sowing and T<sub>7</sub> = Full after 8 weeks of sowing+ after 8 weeks of sowing.

2 extra treatments: F<sub>0</sub> = 0 and F<sub>1</sub> = 60 lb./ac. of P<sub>2</sub>O<sub>5</sub>. 
3. DESIGN:
(i) Split-plot in L. Sq. (ii) (a) 4 main-plots/replication ; 16 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 24.5' x 19.5'. (b) 23' x 18'. (v) N.A. (vi) Yes.

4. GENERAL:

5. RESULTS:
(i) 2954 lb./ac. (ii) (a) 184.0 lb./ac. (b) 256.8 lb./ac. (iii) Main effect of T is highly significant. Main effect of F and interaction F x T are significant. (iv) Av. yield of grain in lb./ac. T, T, T, T, T, T, T, T, Mean 2842 2950 3065 2881 2991 3035 2977 2963 2989 2945 2994 2924

Crop :- Wheat.
Type :- 'M'.
Object :- To study the relative value of different nitrogenous fertilizers and time of application of nitrogen for Wheat.

1. BASAL CONDITIONS:
(i) (a) Fallow—Wheat. (b) and (c) N.A. (ii) (a) Sandy soil. (b) N.A. (iii) 19.11.19. (iv) and (vi) N.A. (v) N.P—718 (early). (vi) Irrigated. (vii) 1 hand hoeing and 1 hand weeding. (viii) 1 hand hoeing and 1 hand weeding. (ix) 18 to 20.4.1957.

2. TREATMENTS:
Same as in exp. no. 348(8) on page 300.

3. DESIGN:
(i) Split-plot in L. Sq. (ii) (a) 4 main-plots/block ; 16 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 24.5' x 19.5'. (b) 23' x 18'. (v) N.A. (vi) Yes.

4. GENERAL:

5. RESULTS:
(i) 2954 lb./ac. (ii) (a) 184.0 lb./ac. (b) 256.8 lb./ac. (iii) Main effect of T is highly significant. Main effect of F and interaction F x T are significant. (iv) Av. yield of grain in lb./ac.
Crop: Wheat.  
Ref.: J.A.R.I. 54(9).  
Type: 'M'.

Object: To see whether fertility can be maintained or improved under intensive cropping and heavy manuring.

1. BASAL CONDITIONS:  
   (i) (a) Maize—Wheat.  (b) Maize.  (c) Nil.  (ii) (a) and (b) N.A.  (iii) 15.11.1954.  (iv) (a) 1 ploughing with victory plough, 3 ploughings with desi plough and 1 grubbing with tractor.  (b) to (e) N.A.  (v) Nil.  (vi) N.P.—710.  (vii) Irrigated.  (viii) 1 weeding.  (ix) N.A.  (x) 9 and 10.4.1955.

2. TREATMENTS:  
   5 manural treatments:  
   M₀ = Control, M₁ = 60 lb./ac. of N as A₁S₁+100 lb./ac. of P₂O₅ as Super, M₂ = M₁+100 lb./ac. of K₂O as Pot. Sul., M₃ = 60 lb./ac. of N as F.Y.M.+100 lb./ac. of P₂O₅ as Super+100 lb./ac. of K₂O as Pot. Sul., and M₄ = 60 lb./ac. of N as castor cake+100 lb./ac. of P₂O₅ as Super+100 lb./ac. of K₂O as Pot. Sul.

3. DESIGN:  
   (i) R.B.D.  (ii) 5.  (b) N.A.  (iii) 6.  (iv) (a) 18′×29′.  (b) 32′×23′.  (v) 3′×3′.  (vi) Yes.

4. GENERAL:  
   (i) Satisfactory.  (ii) Nil.  (iii) Yield of grain.  (iv) (a) 1952—1956.  (b) Yes.  (c) Nv.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:  
   (i) 1881 lb./ac.  (ii) 259.4 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain in lb./ac.

   Treatment  
   M₀  M₁  M₂  M₃  M₄  
   Av. yield  1468  2253  2324  1746  1614

S.E./mean  =  83.5 lb./ac.
Crop :- Wheat.  
Ref :- I.A.R.I. 54(10).

Type :- 'M'.

Object :- To see whether fertility can be maintained or improved under intensive cropping and heavy manuring.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat—Maize—Pean. (b) Maize. (c) Nil. (ii) (a) and (b) N.A. (iii) 15.11.1954. (iv) (a) 1 ploughing with victory plough, 2 ploughings with desi plough, 3 grubblings with tractor. (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Thorough weeding. (ix) N.A. (x) 10.4.1955.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(9) on page 302.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1956. (b) Yes (except 1956 rabi). (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2080 lb./ac. (ii) 430.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment  M₀  M₁  M₂  M₃  M₄
   Av. yield  1636  2398  2544  1893  1929
   S.E./mean = 173.7 lb./ac.

---

Crop :- Wheat.  
Ref :- I.A.R.I. 55(2).

Type :- 'M'.

Object :- To see whether fertility can be maintained or improved under intensive cropping and heavy manuring.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize. (b) Maize. (c) Nil. (ii) (a) and (b) N.A. (iii) 7.11.1955. (iv) (a) 1 ploughing with victory plough, 2 ploughings with desi plough and 3 ploughings with trishal and 1 tractor ploughing. (b) to (e) N.A. (v) Nil. (vi) N.P.—760. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 22 and 23.4.1956.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(9) on page 302.

4. GENERAL:
   (i) Good lodging. (ii) Yellow rest. (iii) Yield of grain. (iv) (a) 1952—1956. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1787 lb./ac. (ii) 147.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment  M₀  M₁  M₂  M₃  M₄
   Av. yield  1372  2170  2159  1773  1493
   S.E./mean = 60.0 lb./ac.
Crop: Wheat.  

Ref: I.A.R.I. 56(4).  
Type: 'M'.

Object: To study the effect of inorganic and organic manures on Wheat in Maize—Wheat rotation.

1. BASAL CONDITIONS:
   (i) (a) Maize — Wheat. (b) Maize. (c) As per treatments. (ii) (a) Alluvial loam. (b) N.A. (iii) 16.11.1956.  
   (iv) (a) 1 ploughing with victory plough, 2 harrowings, 3 ploughings with desi plough and double discing by tractor.  
   (b) to (e) N.A.  
   (v) Nil. (vi) N.P.—760. (vii) Irrigated. (viii) 1 hoeing. (ix) 3.72. (x) 17.4.1957.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(9) on page 302.

4. GENERAL:
   (i) The loss of yield due to hail storm on 20.3.1957 and rust was about 64%. (ii) Rust attack. (iii) Yield of grain and straw, height, tiller etc. was recorded. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 369 lb./ac. (ii) 89.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>193</td>
<td>528</td>
<td>505</td>
<td>293</td>
<td>322</td>
</tr>
</tbody>
</table>

S.E./mean = 36.7 lb./ac.

—

Crop: Wheat (Rabi).  

Ref: I.A.R.I. 57(4).  
Type: 'M'.

Object: To study the effect of organic manures and inorganic fertilizers in building up soil fertility as judged from the yield of Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 19.11.1957. (iv) (a) 1 victory ploughing, 2 tractor discing and 3 tractor grubblings. (b) to (e) N.A. (v) Nil. (vi) N.P.—760. (vii) Irrigated. (viii) Hoeings. (ix) N.A.  
   (x) 2 to 4.4.1958.

2. TREATMENTS:
   Same as in exp. no. 54(9) on page 302.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1952—contd. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

RESULTS:
   (i) 1284 lb./ac. (ii) 186.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1011</td>
<td>1540</td>
<td>1538</td>
<td>1041</td>
<td>1288</td>
</tr>
</tbody>
</table>

S.E./mean = 76.3 lb./ac.
Crop: Wheat (Rabi).

Ref: I.A.R.I. 58(2).
Type: 'M'.

Object: To study the effect of organic manures and inorganic fertilizers in building up soil fertility as judged from the yield of Wheat crop.

1. BASAL CONDITIONS:
   (i) Nil. (b) and (c) N.A. (ii) N.A. (iii) 21.11.1958. (iv) 2 ploughings, 2 discings and 1 tractor grubbing. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) N.A. (a) 9.4.1959.

2. TREATMENTS:
   Same as in exp. no. 54(9) on page 302.

3. DESIGN:
   (i) R.B.D. (ii) 6. (iii) 38'×29'. (b) 32'×23'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) 1952—to end. (b) and (c) N.A. (v) and (b) Nil. (vi) N.A. and (vii) Nil.

5. RESULTS:
   (i) 1861 lb./ac. (ii) 445 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1427</td>
<td>2004</td>
<td>1598</td>
<td>2021</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>181.9 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop :- Wheat (Rabi).


Ref :- I.A.R.I. 59(1).

Type :- 'M'.

Object :- To study the effect of organic manures and inorganic fertilizers in building up soil fertility as judged from the yield of Wheat crop.

1. BASAL CONDITIONS :
(i) and (ii) N.A. (iii) 9.11.1959. (iv) (a) 1 tractor grubbing and 1 tractor discing. (b) to (e) N.A. (vi) N.P. - 70b. (vii) Irrigated. (viii) 2 hoeings. (ix) N.A. (x) 2 to 4.4.1960.

2. TREATMENTS :
Same as in exp. no. 54(9) on page 30.

3. DESIGN :
(i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 38'x29'. (b) 36'x27'. (v) 1'x1'. (vi) Yes.

4. GENERAL :
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952- contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
(i) 1790 lb/ac. (ii) 257.9 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1414</td>
<td>2207</td>
<td>1996</td>
<td>1591</td>
<td>1744</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>105.3 lb/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).


Ref :- I.A.R.I. 54(11).

Type :- 'M'.

Object :- To compare the effect of A/S and F.Y.M. on the yield of Wheat.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Maize (c) Nil. (ii) to (a) N.A.

2. TREATMENTS :
12 manurial treatments : M0=Control, M1=40 lb/ac. of N as F.Y.M., M2=80 lb/ac. of N as F.Y.M., M3=120 lb/ac. of N as F.Y.M., M4=20 lb/ac. of N as A/S, M5=40 lb/ac. of N as A/S, M6=60 lb/ac. of N as A/S, M7=40 lb/ac. of N as F.Y.M.,+20 lb/ac. of N as A/S, M8=40 lb/ac. of N as F.Y.M.,+40 lb/ac. of N as A/S, M9=60 lb/ac. of N as A/S, M10=80 lb/ac. of N as A/S, M11=120 lb/ac. of N as F.Y.M.,+M5 and M12=120 lb/ac. of N as F.Y.M.,+M9.
F.Y.M. applied 8 weeks before sowing and A/S half at sowing and half at 1st irrigation.

3. DESIGN :
(i) R.B.D. (ii) 12. (b) N.A. (iii) 8. (iv) (a) 24'x34.5'. (b) 22'x33'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1953- contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
(i) 1211 lb/ac. (ii) 255.2 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
<th>M11</th>
<th>M12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>912</td>
<td>840</td>
<td>885</td>
<td>1050</td>
<td>1102</td>
<td>1372</td>
<td>1598</td>
<td>1200</td>
<td>1440</td>
<td>1478</td>
<td>1220</td>
<td>1416</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>90.6 lb/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop : Wheat (Rabi).


Object : To compare the effect of A/S and F.Y.M. on the yield of wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Maize. (c) Nil. (ii) (a) and (b) N.A. (iii) 10 and 11.11.1955. (iv) (a) 2 Victory ploughings, double tractor discing and grubbing. (b) to (e) N.A. (v) Nil. (vi) NP.—710. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 24.4.1956.

2. TREATMENTS:
   Same as in expt. no. 54(11) on page 306.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 21'×33'. (b) 22'×33'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) 7.11.1955. (iv) N.A. (v) Rows 1' apart. (c) 8.15.1956. (vi) 1 row on either side. (vii) Yes. (viii) N.A. (ix) 16 to 18.4.1957.

5. RESULTS:
   (i) 2234 lb./ac. (ii) 237.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M9</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
<th>M11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1344</td>
<td>1159</td>
<td>1233</td>
<td>1180</td>
<td>1415</td>
<td>1329</td>
<td>1376</td>
<td>1348</td>
<td>1325</td>
<td>1407</td>
<td>1478</td>
<td></td>
</tr>
</tbody>
</table>

   S.E./mean = 79.9 lb./ac.

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Crop : Wheat (Rabi).


Object : To compare the effect of A/S and F.Y.M. on the yield of wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Maize. (c) Nil. (ii) (a) and (b) N.A. (iii) 10 and 11.11.1955. (iv) (a) 2 Victory ploughings, double tractor discing and grubbing. (b) to (e) N.A. (v) Nil. (vi) NP.—710. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 24.4.1956.

2. TREATMENTS:
   Same as in expt. no. 54(11) on page 306.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 1/60 ac. (b) N.A. (v) 1 row on either side. (vi) Yes. (vii) N.A. (viii) N.P.—710 (medium). (ix) Irrigated. (x) 16 to 18.4.1957.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—contd. (b) Yes. (c) N.A. (d) Yes. (v) to (vii) N.A.

5. RESULTS:
   (i) 1324 lb./ac. (ii) 225.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M9</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
<th>M11</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1344</td>
<td>1159</td>
<td>1233</td>
<td>1180</td>
<td>1415</td>
<td>1329</td>
<td>1376</td>
<td>1348</td>
<td>1325</td>
<td>1407</td>
<td>1478</td>
<td></td>
</tr>
</tbody>
</table>

   S.E./mean = 93.9 lb./ac.
Crop: Wheat (Rabi).

Ref: I.R.A.I. 58(4).
Type: ‘M’.

Object: To compare the effect of A/S and F.Y.M. on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 8.11.1958. (iv) (a) 1 tractor ploughing, 1 Victory ploughing and 2 double tractor grubbing. (b) Sowing with simplex drill. (c) to (e) N.A. (v) Nil. (vi) N.P.—710. (vii) Irrigated. (viii) 1 weeding and 3 roujings. (ix) N.A. (x) 13.4.1959.

2. TREATMENTS:
   Same as in exp. no. 54(11) on page 306.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 22’x33’. (b) 20’x31’. (v) 1’x1’. (vi) Yrs.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 1466 lb./ac. (ii) 323.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

   Treatment | M_0 | M_1 | M_2 | M_3 | M_4 | M_5 | M_6 | M_7 | M_8 | M_9 | M_10 | M_11
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
Av. yield | 1428 | 1454 | 1640 | 1726 | 1256 | 1244 | 1468 | 1460 | 1402 | 1601 | 1409 | 1497
S.E./mean = 114.5 lb./ac.

Crop: Wheat (Rabi).

Ref: I.R.A.I. 54(12).
Type: ‘M’.

Object: To study the effect of soil need fertilizer on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) N.A. (ii) (a) and (b) N.A. (iii) 27.11.1954. (iv) (a) 2 ploughings with desi plough and 1 ploughing by Victory plough. (b) N.A. (c) 70 lb./ac. (d) and (e) N.A. (v) Nil. (vi) N.P.—710. (vii) Irrigated. (viii) 1 rouging. (x) 20 to 24.4.1955.

2. TREATMENTS:
   5 manurial treatments: M_4=Control, M_1=30 lb./ac. of N as soil need fertilizer, M_2=30 lb./ac. of A/S, M_3=M_2+28.8 lb./ac. of P_2O_5 as triple Super and M_5=M_2+21.3 lb./ac. of K_2O as Pot Sul.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) 28’x24’. (b) 25.1’x22’. (v) 1’x1’. (vi) Yes.

4. GENERAL:
   (i) Normal. Lodging occurred in some plots. (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 902 lb./ac. (ii) 126.7 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

   Treatment | M_4 | M_1 | M_2 | M_3 | M_4
--- | --- | --- | --- | --- | ---
Av. yield | 700 | 1006 | 862 | 994 | 947
S.E./mean = 51.7 lb./ac.
Crop: Wheat (Rabi).

Object:—To study the effect of soil need fertilizer on Wheat.

1. BASAL CONDITIONS:
   (i) [a] Nil. (b) Maize. (c) N.A. (iii) 27.10.1955. (iv) (a) 2 desi ploughings, 1 Victory ploughing and tractor grubbing. (b) N.A. (c) 70 lb./ac. (d) and (e) N.A. (vii) P 70. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 12 and 13.4.1956.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 54(12) on page 308.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 2371 lb./ac. (ii) 301 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

   Treatment: $M_1$, $M_2$, $M_3$, $M_4$

   Average yield: 2185, 2449, 2475, 2330

   $S.E./mean = 123.2$ lb./ac.

Crop: Wheat (Rabi).

Object:—To study the efficiency of nitrogenous fertilizers at different levels on Wheat.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 22 and 23.4.1957. (iv) 1 P-710. (v) to (vii) Nil.

2. TREATMENTS:
   Same as in expt. no. 54(12) on page 308.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 28’x25’. (iv) (a) and (b) 28’x25’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—contd. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 137 lb./ac. (ii) 207.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment: $M_1$, $M_2$, $M_3$, $M_4$

   Average yield: 643, 1415, 1137, 1300, 1191

   $S.E./mean = 84.6$ lb./ac.
1. BASAL CONDITIONS:
   (i) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 23.11.1956. (iv) (a) 3 to 4 ploughings. (b) to (e) N.A. (v) Nil. (vi) N.P.—710 (medium). (vii) Irrigated. (viii) Nil. (ix) 15.59°. (x) 6.5.1957.

2. TREATMENTS:
   All combination of (1) and (2) with 20 lb./ac. of P₂O₅ + 2 extra treatments
   (2) 3 levels of N : N₁ = 20, N₂ = 40 and N₃ = 60 lb./ac.
   Extra treatments : P₀ = Control (2 plots) and P₁ = 20 lb./ac. of P₂O₅.

3. DESIGN:
   (i) R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 36°×16'. (b) i/60 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) and (iii) Nil. (iv) (a) 1954—cond. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 45 lb./ac. (ii) 166.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>Mean</th>
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<td>469</td>
<td>453</td>
<td>330</td>
<td>505</td>
<td>459</td>
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<tr>
<td>N₂</td>
<td>397</td>
<td>429</td>
<td>532</td>
<td>451</td>
<td>522</td>
<td>466</td>
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<tr>
<td>N₃</td>
<td>524</td>
<td>406</td>
<td>309</td>
<td>518</td>
<td>523</td>
<td>482</td>
</tr>
<tr>
<td>Mean</td>
<td>486</td>
<td>435</td>
<td>461</td>
<td>446</td>
<td>517</td>
<td>469</td>
</tr>
</tbody>
</table>

S.E. of N marginal mean = 37.2 lb./ac.
S.E. of S marginal mean = 48.0 lb./ac.
S.E. of P₀ mean = 58.8 lb./ac.
S.E. of study of table or P₁ mean = 83.1 lb./ac.

Crop :- Wheat (Rabt).
Ref :- I.A.R.I. 57(5).
Type :- 'M'.

Object :- To study the relative effect of different sources of N at different levels on the yield of Wheat.
4. GENERAL:
   (i) Very good growth. Due to heavy rains and wind the crop was lodged in March. (ii) Rust with low intensity was observed in March, 1958. (iii) Grain yield. (iv) (a) 1957—N.A. (b) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2531 lb./ac. (ii) 354.4 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in lb./ac.

   |       | S1  | S2  | S3  | S4  | S5  | S6  | Mean |
---|------|-----|-----|-----|-----|-----|-----|------|
N1  | 2567 | 2134| 2017| 2625| 2232|     | 2335 |
N2  | 2075 | 2557| 2555| 2185| 2585|     | 2522 |
N3  | 2547 | 2925| 2807| 2842| 2760|     | 2776 |
Mean| 2630 | 2539| 2640| 2651| 2526|     | 2561 |

S.E. of N marginal mean = 11.2 lb./ac.
S.E. of S marginal mean = 14.7 lb./ac.
S.E. of P0 mean = 177 2 lb./ac.
S.E. of body of table or P1 mean = 245.6 lb./ac.

---

Crop: Wheat (Rabi).


Type: 'M'.

Object: To study the relative efficiency of nitrogenous fertilizers under dry condition for Wheat.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 4.11.1958. (iv) (a) 1 ploughing with Victory plough, double cultivation, 2 ploughings with desi plough and with tripal. (b) Sown by para. (c) to (e) N.A. (v) N.P.—718. (vi) Unirrigated. (vii) and (ix) N.A. (x) 1 and 2.4.1959.

2. TREATMENTS:
   All combinations of (1) and (2) with 20 lb./ac. of P2O5 + 2 extra treatments
   (1) 5 sources of N: S1 = A/S, S2 = A/N, S3 = A/C, S4 = A/S/N and S5 = Urea.
   (2) 2 levels of N: N1 = 15 and N2 = 30 lb./ac.
   Extra treatments: E0 = Control and E1 = 20 lb./ac. of P2O5.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 22'x21', (b) 20'x19'. (v) 1½ 'x1½'. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) 1956—N.A.* (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 828 lb./ac. (ii) 248.8 lb./ac. (iii) Main effect of N and interaction 'E x others' are highly significant. (iv) Av. yield of grain in lb./ac.

   |       | S1  | S2  | S3  | S4  | Mean |
---|------|-----|-----|-----|-----|------|
N1  | 1073 | 883 | 1032| 1125| 847 | 980  |
N2  | 657  | 835 | 802 | 815 | 729 | 768  |
Mean| 865  | 859 | 912 | 970 | 788 | 879  |
Crop : Wheat (Rabi).


Object : To find out the efficiency of different methods of placement of phosphatic fertilizers at different levels on growth, development and yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil, (b) and (c) N.A.
   (ii) (a) and (b) N.A.
   (iii) 26.1.1954.
   (iv) (a) 1 ploughing with Victory plough, 2 double discing and double grubbing by tractor and 3 picking of guava stools. (b) Sowing. (c) to (e) N.A.
   (v) Nil.
   (vi) N.P.-710.
   (vii) Irrigated.
   (viii) 3 hand weedings.
   (ix) N.A.
   (x) 18.4.1955.

2. TREATMENTS:
   All combinations of (1), (2) and (3) with 30 lb./ac. of N as A/S+2 extra treatments
   (1) 2 sources of P₂O₅: S₁=Triple Super and S₂=Ammo. Phos.
   (2) 2 levels of P₂O₅: P₁=20 and P₂=40 lb./ac.
   (3) 3 methods of fertilizer placement: M₁=Broadcast before final cultivation, M₂=Band placement and M₃=2½' below seed.
   Extra treatments: N₀=0 and N₁=30 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 38.75'×28'. (b) 33'×22'. (v) 2½'×2½'. (vi) Yes.

4. GENERAL:
   (i) and (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—N.A. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 173 lb./ac. (ii) 216 lb./ac. (iii) Main effect of S and 'N₀ vs. others' are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>1908</td>
<td>1895</td>
<td>1501</td>
<td>1799</td>
<td>1986</td>
<td>1918</td>
</tr>
<tr>
<td>S₂</td>
<td>1718</td>
<td>1669</td>
<td>1604</td>
<td>1604</td>
<td>1713</td>
<td>1673</td>
</tr>
<tr>
<td>Mean</td>
<td>1813</td>
<td>1782</td>
<td>1798</td>
<td>1798</td>
<td>1850</td>
<td>1840</td>
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<tr>
<td>M₁</td>
<td>1684</td>
<td>1720</td>
<td></td>
<td>1702</td>
<td>1850</td>
<td>1840</td>
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<td>M₂</td>
<td>1889</td>
<td>1810</td>
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<tr>
<td>M₃</td>
<td>1866</td>
<td>1816</td>
<td></td>
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</tbody>
</table>

S.E. of P or S marginal mean = 44.1 lb./ac.
S.E. of M marginal mean = 54.0 lb./ac.
S.E. of body of S×M or P×M table = 76.4 lb./ac.
S.E. of body of S×P table = 62.3 lb./ac.
S.E. of N mean = 108.0 lb./ac.
Crop :- Wheat (Rabi).

Object :- To study the effect of different methods of placement of different sources of P on Wheat yield.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Fallow. (c) Nil. (d) Sandy loam to loam. (e) N.A. (f) 28.11.1956. (g) (a) 3 (b) to (e) N.A. (h) Nil. (v) N.P.—710 (medium). (vi) Irrigated. (vii) Nil. (ix) 15.59'. (x) 4.5.1957.

2. TREATMENTS :
Same as in expt. no. 55(5) on page 312.

3. DESIGN :
(i) R.B.D. (ii) (a) 1. (b) N.A. (iii) 3. (iv) (a) 1/40 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Hail storm occurred on 2.3.1957 when wheat was in milk stage. This reduced grain yield considerably. (ii) Nil. (iii) Plant population, height of main shoot, tiller counts and yield of grain. (iv) (a) 1954—N.A. (b) Nil. (c) Sandy loam to loam. (d) N.A. (e) 3. (f) to (x) Nil.

5. RESULTS :
(i) 770 lb./ac. (ii) 112.0 lb./ac. (iii) Main effect of M alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>P1</th>
<th>P2</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>N1</th>
<th>N2</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>793</td>
<td>790</td>
<td>767</td>
<td>821</td>
<td>705</td>
<td>798</td>
<td>555</td>
<td>653</td>
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<td>22.2 lb./ac.</td>
</tr>
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<td>28.0 lb./ac.</td>
</tr>
<tr>
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<td></td>
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<td></td>
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<td>56.0 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).

Object :- To find out the efficiency of different methods of placement of phosphatic fertilizers at different levels on growth, development and yield of Wheat.

1. BASAL CONDITIONS :
(i) to (x) N.A.

2. TREATMENTS :
All combinations of (1), (2) and (3) + 2 extra treatments
(1) 3 modes of application : M1=Broadcast, M2=Band placement and M3=Placement 2" below seed.
(2) 2 sources of P2O5 : S1=Super and S2=Ammo. Phos.
(3) 2 levels of P2O5 : P1=20 and P2=40 lb./ac.
Extra treatments : C3=No manure and C4=30 lb./ac. of N as B.D.

3. DESIGN :
(i) R.B.D. (ii) (a) 1. (b) N.A. (iii) 3. (iv) (a) and (b) 45°×15°. (v) N.A. (vi) Yes.

4. GENERAL :
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS :
(i) 1849 lb./ac. (ii) 887.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

Ref :- I.A.R.I. 56(8).
Type :- 'M'.

Ref :- I.A.R.I. 57(6).
Type :- 'M'.

Ref :- I.A.R.I. 57(6).
Type :- 'M'.
S. E. of S or P marginal mean = 209.2 lb./ac.
S. E. of M marginal mean = 256.2 lb./ac.
S. E. of body of S×P table = 295.9 lb./ac.
S. E. of body of S×M or P×M table = 362.4 lb./ac.
S. E. of C mean = 512.5 lb./ac.

Crop = Wheat (Rabi).  
Type = 'M'.

Object: — To find out the efficiency of different methods of placement of phosphatic fertilizers at different levels on growth, development and yield of Wheat.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 1 and 2.12.1958. (iv) (a) 1 ploughing with victory plough, 1 planking, 1 double grubbing and 2 double discings. (b) to (c) N.A. (v) N.A. (vi) N.P.—710. (vii) to (ix) N.A. (x) 21 and 22.4.1959.

2. TREATMENTS:
   Same as in expt. no. 57(6) on page 313.

3. DESIGN:
   (i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) 47°7′×9°6′. (b) 45°0′×7.75′. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 2131 lb./ac. (ii) 333.5 lb./ac. (iii) Only extra treatments difference is significant. (iv) Av. yield of grain in lb./ac.

C_0 = 1806 lb./ac. and C_1 = 2217 lb./ac.

\[
\begin{array}{cccc|cc}
 & M_1 & M_2 & M_3 & \text{Mean} & P_1 & P_2 \\
S_1 & 1920 & 1769 & 1545 & 1745 & 1557 & 1912 \\
S_2 & 1800 & 1861 & 2038 & 1900 & 1889 & 1910 \\
Mean & 1860 & 1815 & 1792 & 1822 & 1723 & 1921 \\
P_1 & 1843 & 1783 & 1543 & & & \\
P_2 & 1877 & 1847 & 2040 & & & \\
\end{array}
\]
Crop - Wheat (Rabi).

Ref: I.A.R.I. 56(9).
Type: ‘M’.

Object - To study the effect of different sources of N on Wheat.

1. BASAL CONDITIONS:
   (i) Nil. (ii) Fallow. (iii) Sandy loam to loam. (iv) Sandy loam to loam. (v) Nil. (vi) 24.11.1956. (vii) Irrigated. (viii) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3) + 3 extra treatments/block
   (1) 3 levels of N : \(N_0 = 0, \ N_1 = 20\) and \(N_2 = 40\) lb./ac.
   (2) 3 sources of N : \(S_1 = A/S, \ S_2 = A/N\) and \(S_3 = \text{Urea}\).
   (3) 3 levels of \(P_2O_5\) as Super: \(P_0 = 0, \ P_1 = 20\) and \(P_2 = 40\) lb./ac.
   Extra treatments: \(E_1 = 60\) lb./ac. of \(N\) as \(A/S\) + \(40\) lb./ac. of \(P_2O_5\) as Super, \(E_2 = 40\) lb./ac. of \(N\) as \(A/S\) + \(80\) lb./ac. of \(P_2O_5\) as Super and \(E_3 = 60\) lb./ac. of \(N\) as \(A/S\) + \(80\) lb./ac. of \(P_2O_5\) as Super.

3. DESIGN:
   (i) 3^3 + 3 confd. (ii) (a) 12 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 1/40 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Hail storm occurred on 2.3.1957, when wheat was in milk stage. This reduced grain yield considerably.
   (ii) Nil. (iii) Yield of grain. (iv) (a) 1953-N.A. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Raw data and two way tables N.A.

5. RESULTS:
   (i) 534 lb./ac. (ii) 111.7 lb./ac. (iii) Main effect of P and E are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
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<td>N_0</td>
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</tr>
<tr>
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</tr>
<tr>
<td>N_2</td>
<td>614</td>
</tr>
<tr>
<td>N_3</td>
<td>564</td>
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<td>S_1</td>
<td>551</td>
</tr>
<tr>
<td>S_2</td>
<td>519</td>
</tr>
<tr>
<td>S_3</td>
<td>421</td>
</tr>
<tr>
<td>P_0</td>
<td>545</td>
</tr>
<tr>
<td>P_1</td>
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<td>P_2</td>
<td>615</td>
</tr>
<tr>
<td>P_3</td>
<td>600</td>
</tr>
<tr>
<td>E_0</td>
<td>759</td>
</tr>
</tbody>
</table>

   | S.E. of N or P mean | = 26.3 lb./ac. |
   | S.E. of S mean      | = 32.4 lb./ac. |
   | S.E. of E mean      | = 45.6 lb./ac. |

Crop - Wheat (Rabi).

Ref: I.A.R.I. 56(7).
Type: ‘M’.

Object - To study the effect of different sources of N at different levels of \(P_2O_5\) on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 20 and 21.11.1958. (iv) (a) 1 ploughing with victory plough, 1 ploughing with desi plough, double grubbing, 2 double discings and 2 plankings. (b) Sowing with drill. (c) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 18 and 20.4.1959.
2. TREATMENTS:

All combinations of (1), (2) and (3) + 3 extra treatments/block

(1) 3 levels of N : N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
(2) 3 sources of N : S₁ = A/S, S₂ = A/N and S₃ = Urea.
(3) 3 levels of P₂O₅ : P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.

3 extra treatments : E₁ = 60 lb./ac. of N + 40 lb./ac. of P₂O₅, E₂ = 40 lb./ac. of N + 60 lb./ac. of P₂O₅ and E₃ = 60 lb./ac. of N + 80 lb./ac. of P₂O₅.

3. DESIGN:

(i) 3 x 3 confd. (ii) 12 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/70.7 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS:

(i) 1555 lb./ac. (ii) 569.9 lb./ac. (iii) Main effect of S and interaction 'E vs. others' are significant. (iv) Av. yield of grain in lb./ac.: E₁ = 2022 lb./ac.; E₂ = 1520 lb./ac. and E₃ = 1891 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1316</td>
<td>1164</td>
<td>1129</td>
<td>1203</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>N₁</td>
<td>1467</td>
<td>1366</td>
<td>1779</td>
<td>1337</td>
<td>1838</td>
<td>1592</td>
<td>1181</td>
</tr>
<tr>
<td>N₂</td>
<td>1416</td>
<td>1668</td>
<td>1925</td>
<td>1669</td>
<td>1944</td>
<td>1148</td>
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<tr>
<td>Mean</td>
<td>1400</td>
<td>1399</td>
<td>1611</td>
<td>1470</td>
<td>1891</td>
<td>1720</td>
<td>1198</td>
</tr>
<tr>
<td>S₁</td>
<td>1630</td>
<td>1681</td>
<td>2193</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S₂</td>
<td>1560</td>
<td>1719</td>
<td>1831</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S₃</td>
<td>1164</td>
<td>1150</td>
<td>1260</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Mean</td>
<td>1441</td>
<td>1357</td>
<td>1851</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of N or P (N x P table) marginal mean = 134.3 lb./ac.
S.E. of S or P (S x P table) marginal mean = 164.5 lb./ac.
S.E. of body of S x P table = 281.0 lb./ac.
S.E. of body of N x P or N x S table or E mean = 233.7 lb./ac.

Crop :- Wheat.
Ref :- I.A.R.I. 55(6).
Type :- 'M'.

Object :- To find out the fertilizer value of dicalcium phosphate for Wheat and its residual effect on maize as compared to that of Super.

1. BASAL CONDITIONS:

(i) (a) Wheat—Maize. (b) and (c) N.A. (iii) (a) and (b) N.A. (iii) 11.11.1955. (iv) (a) 2 tractor discings, tractor grubbing and 1 ploughing with desi plough. (b) to (c) N.A. (v) N.P.—71S. (vi) Irrigated. (vii) to (ix) N.A. (xi) 27 to 30.4.1956.

2. TREATMENTS:

4 manurial treatments : M₀ = Control, M₁ = 40 lb./ac. of N as A/S/N, M₂ = M₁ + 60 lb./ac. of P₂O₅ as Super and M₃ = M₂ + 60 lb./ac. of P₂O₅ as dicalcium phosphate.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 4' x 27'. (b) 41' x 25'. (v) 7' x 7'. (vi) Yes.
4. GENERAL:
(i) (a) N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1791 lb./ac. (ii) 1250.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1345</td>
<td>1870</td>
<td>1933</td>
<td>2016</td>
</tr>
</tbody>
</table>

S.E./mean = 102.1 lb./ac.

Crop : Wheat.
Ref : I.A.R.I. 56(10).
Type : ‘M’.

Object : To find out the fertilizer value of dicalcium phos. for Wheat and its residual effect on maize as compared to that of Super.

1. BASAL CONDITIONS :
(i) (a) N.A. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 16.11.1956. (iv) (a) 2 tractor discings, grubbing and desi ploughing. (b) to (e) N.A. (v) N.A. (vi) N.P.—710. (vii) Irrigated. (viii) 1 hand hoeing. (ix) N.A. (x) 26 and 27.4.1957.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 55(6) on page 316.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) No. (vi) Crop was damaged by hail storm on 20.3.1957 to the extent of 75%. (vii) Nil.

5. RESULTS:
(i) 456 lb./ac. (ii) 69.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>196</td>
<td>397</td>
<td>642</td>
<td>588</td>
</tr>
</tbody>
</table>

S.E./mean = 28.5 lb./ac.

Crop : Wheat (Rahi).
Ref : I.A.R.I. 57(7).
Type : ‘M’.

Object : To study the fertilizer value of dicalcium phos. on maize and Wheat.

1. BASAL CONDITIONS :
(i) (a) N.A. (b) Maize. (c) N.A. (ii) (a) and (b) N.A. (iii) 6.12.1957. (iv) (a) 1 victory ploughing, 2 desi ploughings, 1 irregular ploughing and 1 tractor discing. (b) to (e) N.A. (v) N.A. (vi) N.P.—710. (vii) Irrigated. (viii) and (ix) N.A. (x) 17.4.1958.

2. TREATMENTS :
4 manurial treatments : \( M_0 \)=Control, \( M_1 \)=40 lb./ac. of N as A/S/N, \( M_2 \)=\( M_1 \)+80 lb./ac. of \( P_2 O_5 \) as Super and \( M_3 \)=\( M_1 \)+80 lb./ac. of \( P_2 O_5 \) as dicalcium phos.

3. DESIGN :
(i) 3.8 D (b) N.A. (iii) 6. (iv) (a) 24’ x 30’. (b) 22’ x 28’. (v) 1’ x 1’. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—cont’d. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 888 lb./ac. (ii) 110.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₄</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>544</td>
<td>813</td>
<td>1113</td>
<td>1081</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>45.2 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi).


Object: To study the fertilizer value of dicalcium phos. on Wheat and maize.

1. BASAL CONDITIONS:
(i) (a) Maize—Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) N.A. (iii) 5.12.1958. (iv) to (vi) N.A. (v) Nil. (vi) and (vii) Nil.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 57(7) on page 317.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—cont’d. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 924 lb./ac. (ii) 215.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₄</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>556</td>
<td>907</td>
<td>1251</td>
<td>981</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>87.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi).


Object: To study the effect of guar as G.M. with P and micronutrients on Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) As per treatments. (ii) (a) and (b) N.A. (iii) 16.11.1954. (iv) to (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 19.4.1955.

2. TREATMENTS:
10 cultural treatments: C₀=Guar. C₁=Guar without P₂O₅ removed, C₂=Guar without P₂O₅ buried, C₃=Guar with 60 lb./ac. of P₂O₅ removed, C₄=Guar with 60 lb./ac. of P₂O₅ buried, C₅=Guar with 60 lb./ac. of P₂O₅+5 lb./ac. of Borax buried, C₆=Guar with 60 lb./ac. of P₂O₅+5 lb./ac. of Borax+1 lb./ac. of Molybdenum removed, C₇=Guar with 60 lb./ac. of P₂O₅+5 lb./ac. of Borax+1 lb./ac. of Molybdenum buried, C₈=Guar burried from C₁, C₉=Guar burried from C₃ and C₁₀=Guar burried from C₅.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 45° x 15°. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1951—1954. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 501 lb./ac. (ii) 127.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
<th>C8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>715</td>
<td>796</td>
<td>946</td>
<td>839</td>
<td>968</td>
<td>903</td>
<td>1086</td>
<td>860</td>
<td>914</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>52.2</td>
<td></td>
</tr>
</tbody>
</table>

---

Crop: Wheat (Rabi).

Ref: I.A.R.I. 59(2).
Type: ‘M’.

Object: To study the effect of organic manures and fertilizers on Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Wheat—Maize. (b) and (c) N.A.
(ii) to (x) N.A.

2. TREATMENTS:

Main-plot treatments:
4 organic manurial treatments: T0 = No manure, T1 = Guo' (G.M.), T2 = 60 lb./ac. of N as Castor cake and T3 = 60 lb./ac. of N as FYM.

Sub-plot treatments:
5 inorganic manurial treatments: M0 = No manure, M1 = 40 lb./ac. of N as A/S, M2 = 80 lb./ac. of P2O5 as Super, M3 = 40 lb./ac. of N as A/S + 80 lb./ac. of P2O5 as Super and M4 = M3 + 60 lb./ac. of K2O as Pot. Sul.

Sub-sub-plot treatments:
2 levels of fertilizer: N0 = 0 (no fertilizer) and N1 = 30 lb./ac. of N as A/S.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/repetition : 5 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) 1'x12'. (b) 49'x10'. (v) 1'x1'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1.50—N.A. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 1382 lb./ac. (ii) (a) 267.6 lb./ac. (b) 265.4 lb./ac. (c) 201.1 lb./ac. (iii) Main effect of M is highly significant as that of T and N are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>Mean</th>
<th>N0</th>
<th>N1</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>1281</td>
<td>1317</td>
<td>1233</td>
<td>1402</td>
<td>1256</td>
<td>1294</td>
<td>1137</td>
<td>1451</td>
</tr>
<tr>
<td>T1</td>
<td>1282</td>
<td>1355</td>
<td>1446</td>
<td>1462</td>
<td>1480</td>
<td>1404</td>
<td>1275</td>
<td>1534</td>
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<tr>
<td>T2</td>
<td>1357</td>
<td>1434</td>
<td>1392</td>
<td>1546</td>
<td>1460</td>
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<td>T3</td>
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<td>1278</td>
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<td>1337</td>
<td>1489</td>
<td>1408</td>
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<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>1185</td>
<td>1296</td>
</tr>
<tr>
<td>T1</td>
<td>1412</td>
<td>1530</td>
</tr>
</tbody>
</table>
S.E. of difference of two

1. \( T \) marginal means = 48.9 lb./ac. 6. \( N \) means at the same level of \( M \) = 58.1 lb./ac.
2. \( M \) marginal means = 54.2 lb./ac. 7. \( M \) means at the same level of \( N \) = 68.0 lb./ac.
3. \( N \) marginal means = 26.0 lb./ac. 8. \( N \) means at the same level of \( T \) = 51.9 lb./ac.
4. \( M \) means at the same level of \( T \) = 108.3 lb./ac. 9. \( T \) means at the same level of \( N \) = 61.1 lb./ac.
5. \( T \) means at the same level of \( M \) = 101.5 lb./ac.

---

**Crop :** Wheat (Rabi).

**Site :** Indian Agri. Res. Instt., New Delhi.

**Object :** To study the effect of different levels and sources of \( N \) on Wheat.

1. **BASAL CONDITIONS :**
   (i) and (ii) N.A. (vi) (vii) N.A.

2. **TREATMENTS :**
   All combinations of (1) and (2): a control
   (1) 4 sources of \( N \) : \( S_1 = \text{A}, S_2 = \text{A}, S_3 = \text{Urea} \) and \( S_4 = \text{NitroMagnesia} \).
   (2) 3 levels of \( N \) : \( N_1 = 20, N_2 = 40 \) and \( N_3 = 60 \) lb./ac.

3. **DESIGN :**
   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 22' \times 29'. (b) 20' \times 27'. (v) 1' \times 1'. (vi) Yes.

4. **GENERAL :**
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS :**
   (i) 2015 lb./ac. (ii) 227.7 lb./ac. (iii) Main effect of \( N \) and interaction \( N \times S \) are significant. "Control vs. others" is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( S_4 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_1 )</td>
<td>1817</td>
<td>2266</td>
<td>2069</td>
<td>1796</td>
<td>1987</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>2067</td>
<td>2381</td>
<td>2220</td>
<td>2063</td>
<td>2183</td>
</tr>
<tr>
<td>( N_3 )</td>
<td>1981</td>
<td>1851</td>
<td>1996</td>
<td>2238</td>
<td>2017</td>
</tr>
<tr>
<td>Mean</td>
<td>1955</td>
<td>2166</td>
<td>2095</td>
<td>2032</td>
<td>2062</td>
</tr>
</tbody>
</table>

S.E. of \( N \) marginal mean = 56.9 lb./ac.
S.E. of \( S \) marginal mean = 65.7 lb./ac.
S.E. of body of table or control mean = 113.8 lb./ac.

---

**Crop :** Wheat (Rabi).

**Site :** Indian Agri. Res. Instt., New Delhi.

**Object :** To study the effect of different levels and sources of \( N \) on Wheat.

1. **BASAL CONDITIONS :**
   (i) and (ii) N.A. (iii) 25.11.1958. (iv) (a) 2 ploughings with victory plough. 1 double grubbing and 2 double discings. (b) Drilling. (c) to (e) N.A. (v) N.A. (vi) N.P.—710. (vii) Irrigated. (viii) and (ix) N.A. (x) 15 to 17.4.1959.

2. **TREATMENTS :**
   Same as in exp. no. 57(8) above.
3. DESIGN:
(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) 29'×22'. (b) 25'×20'. (v) 2'×1'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 2524 lb./ac. (ii) 428.5 lb./ac. (iii) Main effect of N is significant and "control vs. others" is highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1870 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
<td>2459</td>
<td>2084</td>
<td>2284</td>
<td>2168</td>
<td>2321</td>
</tr>
<tr>
<td>N₂</td>
<td>3003</td>
<td>2729</td>
<td>2548</td>
<td>2799</td>
<td>2770</td>
</tr>
<tr>
<td>N₃</td>
<td>2150</td>
<td>2735</td>
<td>3075</td>
<td>2266</td>
<td>2646</td>
</tr>
<tr>
<td>Mean</td>
<td>2654</td>
<td>2516</td>
<td>2636</td>
<td>2511</td>
<td>2579</td>
</tr>
</tbody>
</table>

S.E. of N marginal mean = 107.1 lb./ac.
S.E. of S marginal mean = 128.7 lb./ac.
S.E. of body of table or control mean = 214.2 lb./ac.

---

Crop :- Wheat (Rabi).
Type :- 'M'.

Object :- To study the effect of different methods of application of different fertilizers on Wheat.

1. BASAL CONDITIONS:
(i) to (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)-a control
(1) 7 manurial treatments: M₁ = 20 lb./ac. of N, M₂ = 40 lb./ac. of N, M₃ = 20 lb./ac. of P₂O₅, M₄ = 20 lb./ac. of K₂O, M₅ = 20 lb./ac. of N₂+20 lb./ac. of P₂O₅, M₆ = 20 lb./ac. of N₂+20 lb./ac. of K₂O and M₇ = 40 lb./ac. of N₂+20 lb./ac. of P₂O₅+20 lb./ac. of K₂O.
(2) 2 methods of application: S₁ = Soil application and S₂ = Spraying thrice at 1% concentration solution of fertilizers.

3. DESIGN:
(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) and (b) 1/120 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 2312 lb./ac. (ii) 246.9 lb./ac. (iii) Main effect of M and 'control vs. others' are highly significant. (iv) Av. yield of grain in lb./ac.

Control = 1650 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>2417</td>
<td>2496</td>
<td>1986</td>
<td>1983</td>
<td>2622</td>
<td>2619</td>
<td>2803</td>
<td>2419</td>
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<tr>
<td>S₂</td>
<td>2332</td>
<td>2433</td>
<td>2139</td>
<td>1892</td>
<td>2319</td>
<td>2343</td>
<td>2633</td>
<td>2299</td>
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<tr>
<td>Mean</td>
<td>2374</td>
<td>2464</td>
<td>2062</td>
<td>1938</td>
<td>2470</td>
<td>2485</td>
<td>2718</td>
<td>2359</td>
</tr>
</tbody>
</table>
Crop: Wheat (Rabi).


Ref: I.A.R.I. 59(3).

Object: To study the effect of different methods of application of different fertilizers on Wheat.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 7.11.1959. (iv) (a) 1 Victory ploughing, 1 desi ploughing and 1 double discing with tractor. (b) to (e) N.A. (vi) N.P.—0.33. (vii) Irrigated. (viii) 1 hand weeding and 1 hand hoeing. (ix) N.A. (x) 5 and 3.4.1959.

2. TREATMENTS:
   All combinations of (I) and (II) + a control
   (I) 7 manurial treatments: M, = 40 lb./ac. of N, M, = 30 lb./ac. of P\textsubscript{2}O\textsubscript{5}, M, = 20 lb./ac. of K\textsubscript{2}O, M, = 20 lb./ac. of N, M, = 20 lb./ac. of P\textsubscript{2}O\textsubscript{5}, M, = 20 lb./ac. of N, M, = 20 lb./ac. of P\textsubscript{2}O\textsubscript{5} and M, = 20 lb./ac. of K\textsubscript{2}O.

   (II) 2 methods of application: S, = Soil application and S, = Foliar spray.
   N applied as Urea, P\textsubscript{2}O\textsubscript{5} as triple Super and K\textsubscript{2}O as Pot. Sul.

3. DESIGN:
   (i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 1/100 ac (b) 1/120 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1953—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2176 lb./ac. (ii) 335.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

   Control = 2553 lb./ac.

   \begin{center}
   \begin{tabular}{|c|c|c|c|c|c|c|c|}
   \hline
   & M, & M, & M, & M, & M, & M, & Mean \\
   \hline
   S, & 2576 & 2233 & 2338 & 2122 & 2441 & 2220 & 2176 & 2318 \\
   S, & 2331 & 2196 & 2515 & 2610 & 2122 & 2269 & 2384 & 2407 \\
   \hline
   Mean & 2404 & 2316 & 2447 & 2366 & 2432 & 2245 & 2330 & 2363 \\
   \hline
   \end{tabular}
   \end{center}

   S.E. of S marginal mean = 77.9 lb./ac.
   S.E. of M marginal mean = 136.4 lb./ac.
   S.E. of body of table or control mean = 192.9 lb./ac.

Crop: Wheat (Rabi).

Site: Bot. Sub-Stn., Pusa.

Ref: I.A.R.I. 54(14).

Object: To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize. (b) Maize. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 20 to 23.11.1954. (iv) (a) 4 ploughings with desi ploughing and 1 harrowing. (b) to (e) N.A. (v) Nil. (vi) and (vii) N.A. (viii) Weeding. (a) 2.45". (x) 7 to 13.4.1955.
2. TREATMENTS:

10 manurial treatments: M1 = 8000 lb/ac. of FYM, M2 = 40 lb/ac. of N as Rape cake, M3 = 40 lb/ac. of K2O as Pot. Sul., M4 = 40 lb/ac. of P2O5 as Super, M5 = M2 + M3, M6 = M1 + M4 + M5, M7 = M3 + M5 + M7 and M8 = M5 + M8.

M3 and M4 were applied only to previous kharif crop.

3. DESIGN:

(i) R.B.D. (ii) (a) 10, (b) N.A. (iii) 10. (iv) (a) 44' x 24', (b) 41' x 22'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1930—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 519 lb/ac. (ii) 127.4 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>428</td>
<td>620</td>
<td>481</td>
<td>569</td>
<td>444</td>
<td>471</td>
<td>401</td>
<td>599</td>
<td>592</td>
</tr>
</tbody>
</table>
| S.E./mean | =40.3 lb/ac.

Crop: Wheat (Rabi).

Site: Bot. Sub-Sta., Pusa.

Object: To study the effect of N, P and K on Wheat.

1. BASAL CONDITIONS:

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 3.11.1958. (iv) (a) 3 ploughings, 3 beamings and harrowing. (b) to (e) N.A. (v) N.A. (vi) N.P.—52. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 28.1.1959.

2. TREATMENTS:

10 manurial treatments: T1 = FYM, T2 = 8000 lb/ac. of FYM, T3 = 40 lb/ac. of N as Rape cake, T4 = 40 lb/ac. of N as A/S, T5 = 50 lb/ac. of K2O as Pot. Sul., T6 = 80 lb/ac. of P2O5 as Super, T7 = T4 + T5, T8 = T3 + T4 + T6, T9 = T5 + T6 and T10 = T3 + T4 + T6.

3. DESIGN:

(i) R.B.D. (ii) (a) 10, (b) N.A. (iii) 10. (iv) (a) N.A. (b) 42' x 22'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Yellow and brown rust. (ii) N.A. (iii) Yield of grain. (iv) (a) 1930—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 488 lb/ac. (ii) 137.9 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>430</td>
<td>882</td>
<td>537</td>
<td>456</td>
<td>387</td>
<td>427</td>
<td>345</td>
<td>491</td>
<td>515</td>
</tr>
</tbody>
</table>
| S.E./mean | =43.6 lb/ac.

Crop: Wheat (Rabi).


Object: To study the effect of different levels of N, P and K on two varieties of Wheat.

Ref. = I.A.R.I. 58(11).

Type = 'M'.

Ref. = I.A.R.I. 54(15).

Type = 'MV'.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 14.11.1953. (iv) (a) 4 ploughing and 1 grubbing. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 17.4.1954.

2. TREATMENTS:
Main-plot treatments: All combinations of (i), (2) and (3)
(1) 3 levels of N as A/S: N₀ = 0, N₁ = 30 and N₂ = 60 lb./ac.
(2) 3 levels of P₂O₅ as Super: P₀ = 0, P₁ = 40 and P₂ = 80 lb./ac.
(3) 3 levels of K₂O as Pot. Sul.: K₀ = 0, K₁ = 30 and K₂ = 60 lb./ac.
Sub-plot treatments: 2 varieties: V₁ = N.P.-718 and V₂ = C-518. The fertilizers were mixed with soil and put in the furrows opened by country plough.

3. DESIGN:
(i) 3 x 2 split-plot conf. (ii) 3 blocks/replication; 9 m²-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 26'x21'. (b) 21'x16'7'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Yellow and brown rust appeared. (iii) Yield of grain. (iv) (a) 1953-1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1973 lb./ac. (ii) (a) 315.3 lb./ac. (b) 240.2 lb./ac. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>1854</td>
<td>1815</td>
<td>1869</td>
<td>1761</td>
<td>1875</td>
<td>1884</td>
<td>1824</td>
<td>1857</td>
<td>1837</td>
</tr>
<tr>
<td>V₂</td>
<td>2107</td>
<td>2041</td>
<td>2196</td>
<td>2041</td>
<td>2126</td>
<td>2151</td>
<td>2078</td>
<td>2086</td>
<td>2134</td>
</tr>
<tr>
<td>K₀</td>
<td>1856</td>
<td>1882</td>
<td>2115</td>
<td>2002</td>
<td>1937</td>
<td>1914</td>
<td>1855</td>
<td>1937</td>
<td>1914</td>
</tr>
<tr>
<td>K₁</td>
<td>2002</td>
<td>1921</td>
<td>1991</td>
<td>1820</td>
<td>2070</td>
<td>2024</td>
<td>1820</td>
<td>2070</td>
<td>2024</td>
</tr>
<tr>
<td>K₂</td>
<td>2055</td>
<td>1940</td>
<td>1992</td>
<td>1882</td>
<td>1990</td>
<td>2115</td>
<td>1882</td>
<td>1990</td>
<td>2115</td>
</tr>
<tr>
<td>P₀</td>
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<td>1835</td>
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<td>1914</td>
</tr>
<tr>
<td>P₁</td>
<td>1948</td>
<td>1975</td>
<td>2074</td>
<td>1820</td>
<td>2070</td>
<td>2024</td>
<td>1820</td>
<td>2070</td>
<td>2024</td>
</tr>
<tr>
<td>P₂</td>
<td>2105</td>
<td>1933</td>
<td>2015</td>
<td>1882</td>
<td>1990</td>
<td>2115</td>
<td>1882</td>
<td>1990</td>
<td>2115</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N, P or K marginal means = 8.9 lb./ac.
2. V marginal means = 46.2 lb./ac.
3. V means at the same level of N, P or K = 80.1 lb./ac.
4. N, P or K means at the same level of V = 100.3 lb./ac.
S.E. of body of N x P, N x K or P x K table = 101.5 lb./ac.

Crop: Wheat (Rabi).
Object: To study the effect of different levels of N, P and K on different varieties of Wheat.

1.2 BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 4 and 5.11.1955. (iv) (a) 2 discings, 2 grubblings and 3 ploughings. (b) to (e) N.A. (c) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 hoeing. (ix) N.A. (x) 16 and 17.4.1956.

Ref: I.A.R.I. 55(7).
Type: 'MV'.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S: N_0 = 0, N_1 = 30 and N_2 = 60 lb./ac.
(2) 3 levels of P_2O_5 as Super: P_0 = 0, P_1 = 30 and P_2 = 60 lb./ac.
(3) 3 levels of K_2O as Pot. Sui.: K_0 = 0, K_1 = 30 and K_2 = 60 lb./ac.

Sub-plot treatments:
2 varieties: V_1 = N.P.-718 and V_2 = C.-518.

The fertilizers were mixed with soil and put in the furrows opened by country plough.

3. DESIGN:
(i) 3^3 x 2 split-plot confd.  
(ii) 9 main-plots/block and 2 sub-plots/main-plot.
(iv) A N.A. (v) Yes.

4. GENERAL:

5. RESULTS:
(i) 1624 lb./ac.  
(ii) (a) 322.3 lb./ac. (b) 255.3 lb./ac. (iii) Main effects of N, P and V are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>P_0</th>
<th>P_1</th>
<th>P_2</th>
<th>K_0</th>
<th>K_1</th>
<th>K_2</th>
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</tr>
</thead>
<tbody>
<tr>
<td>1254</td>
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<td>1617</td>
<td>1304</td>
<td>1469</td>
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<td>1887</td>
<td>1846</td>
<td>1851</td>
<td>1745</td>
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<tr>
<td>Mean</td>
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<td>1646</td>
<td>1848</td>
<td>1641</td>
<td>1678</td>
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<td>1625</td>
<td>1594</td>
<td>1653</td>
</tr>
<tr>
<td>K_0</td>
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<td>1882</td>
<td>1374</td>
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<td>1664</td>
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</tr>
<tr>
<td>K_1</td>
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<td>1869</td>
<td>1435</td>
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<td>1848</td>
<td>1367</td>
<td>1713</td>
<td>2112</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N, P or K marginal means = 76.0 lb./ac.
2. V marginal means = 49.1 lb./ac.
3. V means at the same level of N, P or K = 85.1 lb./ac.
4. N, P or K means at the same level of V = 96.9 lb./ac.
S.E. of body of N x P, N x K or P x K table = 93.0 lb./ac.

Crop :- Wheat (Rabi).
Object :- To study the effect of different levels of N, P or K on different varieties of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam to loam. (b) N.A. (iii) 23 and 24.II.1956. (iv) (a) 3 discings and 7 grubbings. (b) Drilling. (c) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 15.59'. (x) 8.5.1957.

2. TREATMENTS:

Main-plot treatments:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S: N_0 = 0, N_1 = 20 and N_2 = 40 lb./ac.
(2) 3 levels of P_2O_5 as Super: P_0 = 0, P_1 = 20 and P_2 = 40 lb./ac.
(3) 3 levels of K_2O as Pot. Sui.: K_0 = 0, K_1 = 20 and K_2 = 40 lb./ac.
Sub-plot treatments:
2 varieties: $V_1 = N.P._710$ and $V_2 = N.P._718$.

3. DESIGN:
(i) $3^2 \times 2$ split-plot confd. (ii) (a) 3 blocks/respliation; 9 main-plots/block and 2 sub-plots/main-plot.
(b) N.A. (iii) 2 (iv) (a) 1/40 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953-1957. (b) N.A. (v) (a) and (b) N.A.
(vi) Hall storm on 2.3.1957, which was in milk stage. This considerably reduced the grain yield.

5. RESULTS:
(i) 543 lb./ac. (ii) (a) 144.4 lb./ac. (b) 141.8 lb./ac. (iii) Mean effects of N and V are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>K0</th>
<th>K1</th>
<th>K2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>V1</td>
<td>447</td>
<td>455</td>
<td>482</td>
<td>437</td>
<td>430</td>
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<tr>
<td>Mean</td>
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<td>628</td>
<td>548</td>
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</tr>
<tr>
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<td>571</td>
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<td>599</td>
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</tbody>
</table>

S.E. of difference of two
1. N, P or K marginal means = 34.1 lb./ac.
2. V marginal means = 27.9 lb./ac.
3. V means at the same level of N, P or K = 48.3 lb./ac.
4. N, P or K means at the same level of V = 48.3 lb./ac.
S.E. of body of N×P, N×K or P×K table = 41.7 lb./ac.

Crop: Wheat (Rabi).
Ref: I.A.R.I. 57(10).
Type: 'MV'.

Object: To study the effect of different levels of N, P and K on different varieties of Wheat.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 4 and 5.11.1957. (iv) (a) 1 grubbing, 1 ploughing with country plough, 1 discing and 1 planking. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 14 to 17.4.1958.

2. TREATMENTS:
Treatments in one direction:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/3: N0=0, N1=20 and N2=40 lb./ac.
(2) 3 levels of P2O5 as Super: P0=0, P1=10 and P2=40 lb./ac.
(3) 3 levels of K2O as Pot. Sulf: K0=0, K1=20 and K2=40 lb./ac.

Treatments in orthogonal direction:
2 varieties: $V_1 = N.P._710$ and $V_2 = N.P._718$. 

---
3. DESIGN:
(i) 3 x 2 strip-plot confd. (ii) 3 blocks/replcation; 9 plots/block in one direction and 2 plots in orthogonal direction. (b) N.A. (iii) 2. (iv) (a) 37' x 19.5', (b) 32' x 17', (v) 2.5' x 0.75'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Incidence of brown rust. (iii) Yield of grain. (iv) (a) 1953—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2776 lb./ac. (ii) (a) 81.1 lb./ac. for N, P or K. (b) 252.3 lb./ac. for V. (c) 289.1 lb./ac. for interaction of N, P and K with V. (iii) Main effect of P alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N</th>
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<th>K</th>
<th>Mean</th>
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<td>2783</td>
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<tr>
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<tr>
<td>P2</td>
<td>2804</td>
<td>2936</td>
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</tbody>
</table>

S.E. of difference of two marginal means:
1. N, P or K marginal means = 89.9 lb./ac.
2. V marginal means = 67.8 lb./ac.
3. V means at the same level of N, P or K = 103.9 lb./ac.
4. N, P or K means at the same level of V = 112.7 lb./ac.
5. S.E. of body of N x P, N x K or P x K table = 110.0 lb./ac.

---

Crop :- Wheat (Rabi).


Ref :- I.A.R.I. 58(13).

Type :- MV'.

Object :- To study the effect of different levels of N, P and K on different varieties of Wheat.

1. BASAL CONDITIONS:
(i) to (v) N.A. (vi) As per treatments. (vii) to (x) N.A.

2. TREATMENTS:

Main-plot treatments:
2 varieties : V1=N.P.—710 and V2=N.P.—718.

Sub-plot treatments:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : N0 =0, N1 =20 and N2 =40 lb./ac.
(2) 3 levels of P2O5 as Super : P0 =0, P1 =20 and P2 =40 lb./ac.
(3) 3 levels of K2O as Pot. Sul. : K0 =0, K1 =20 and K2 =40 lb./ac.

3. DESIGN:
(i) 2 x 3 split-plot confd. (ii) (a) 2 main-plots/replcation : 27 sub-plots/main-plot and 9 sub-plots/block. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 32' x 14.25'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1953—1958. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:

(i) 1913 lb./ac.  (ii) 294.8 lb./ac.  (iii) Main effect of N alone is highly significant.  (iv) Av. yield of grain in lb./ac.

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<th></th>
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S.E. of difference of two
1. V marginal means = 56.7 lb./ac.
2. N, P or K marginal means = 95.6 lb./ac.
3. N, P or K means at the same level of V = 135.1 lb./ac.
4. V means at the same level of N, P or K = 391.5 lb./ac.
S.E. of body of N×P, P×K, or N×K table = 117.0 lb./ac.

Crop : Wheat (Rabi).
Object : To study the responses of different varieties of Wheat to different levels of N and P.

1. BASAL CONDITIONS:
   (i) and (ii) N.A.  (iii) 18.11.1954.  (iv) (a) 3 ploughings, 2 tractor discings, 1 tractor grubbing and 1 double discing.  (b) By kera.  (c) to (e) N.A.  (v) Irrigated.  (vi) 2 weedings.
2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 varieties : V1 = Local, V2 = N.P.—718 and V3 = N.P.—775.
   (2) 3 levels of N as A/S : N0 = 0, N1 = 20 and N2 = 40 lb./ac.
   (3) 3 levels of P0 as triple Super : P0 = 0, P1 = 40 and P2 = 40 lb./ac.
3. DESIGN:
   (i) 3×3 confd.  (ii) 9 plots/block and 3 blocks/repetition.  (b) N.A.  (iii) 2.  (iv) (a) 53'×14'.  (b) 48.5'×9'.  (v) N.A.  (vi) Yes.
4. GENERAL:
   (i) Good. Lodging observed in plots treated with high dose of fertilizer.  (ii) Smut appeared in V1 and V2.  Slight attack of brown and yellow rusts in V1 and V2 in later stage.  (iii) Yield of grain.  (iv) (a) 1954—N.A.  (b) No.  (c) Nil.  (v) to (vii) Nil.
5. RESULTS:
   (i) 2155 lb./ac.  (ii) 201.9 lb./ac.  (iii) Main effect of V alone is highly significant.  (iv) Av. yield of grain in lb./ac.
Crop - Wheat (Rabi).
Ref. - I.A.R.I. 55(8).
Type - MV'.

Object - To find out the optimum level of manuring for different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 17.11.1955. (iv) (a) 2 grubblings and 1 tractor discing. (b) N.A. (c) 35 yrs./ac. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 28.4.1956 and 1.5.1956.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   6 manurai treatments: M0=0, M1=60 lb./ac. of P2O5, M2=20 lb./ac. of N, M3=40 lb./ac. of N, M4=80 lb./ac. of N and M5=M3+M4.

3. DESIGN:
   (i) Split-plot with main-plots in L. Sq. (ii) (a) 5 main-plots/repetition and 6 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 24.5'x19.5', (b) 23'x18', (c) 0.75'x0.75'. (v) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954-N.A. (b) Yes. (c) N.I. (v) to (vii) Nil.

5. RESULTS:
   (i) 256 lb./ac. (ii) (a) 570.6 lb./ac. (b) 287.6 lb./ac. (iii) All effects are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
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<td>256</td>
<td>280</td>
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<td>270</td>
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</tbody>
</table>

S.E. of any marginal mean = 47.6 lb./ac.
S.E. of body of any table = 82.4 lb./ac.
Crop :- Wheat (Rabi).
Ref :- I.A.R.I. 57(11).
Type :- 'MV'.

Object :- To find out the optimum level of manuring for different varieties of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Fallow—Wheat. (b) Fallow. (c) Nil. (ii) (a) Loam. (b) N.A. (iii) 20.11.1957. (iv) (a) 3 grubblings and 3 discings. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Nil. (ix) 5.59°. (x) N.A.

2. TREATMENTS to 4. GENERAL :
   Same as in expt. no. 55(8) on page 329.

5. RESULTS :
   (i) 935 lb./ac. (ii) (a) 365.1 lb./ac. (b) 201.6 lb./ac. (iii) Main effect of V is significant and that of M and interaction MxV are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
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<td>1086</td>
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</table>

Mean : 776 698 921 1056 1079 1082 935

S.E. of difference of two
1. V marginal means = 94.3 lb./ac.
2. M marginal means = 57.0 lb./ac.
3. M means at the same level of V = 127.5 lb./ac.
4. V means at the same level of M = 149.8 lb./ac.

---

Crop :- Wheat (Rabi).
Ref :- I.A.R.I. 59(5).
Type :- 'MV'.

Object :- To study the effect of different levels of N on different varieties of Wheat.

1. BASAL CONDITIONS :
   (i) and (ii) N.A. (iii) 4.11.1959. (iv) (a) 1 Victory ploughing, 2 desi ploughings, 2 tractor double grubblings and 1 tractor double discing. (b) to (e) N.A. (v) 20 lb./ac. of P₂O₅ as Super+20 lb./ac. of K₂O as Pot. Sul. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 21.4.1960.

2. TREATMENTS :
   Main-plot treatments :

   Sub-plot treatments :
   4 levels of N : N₀=0, N₁=20, N₂=40 and N₃=60 lb./ac.
3. **DESIGN:**
   (i) Split-plot.
   (ii) (a) 6 main-plots/replication; 4 sub-plots/main-plot.
   (b) N.A.
   (iii) 4.
   (iv) (a) 40' x 15', (b) 36' x 11', (c) 2' x 2'.
   (v) Yes.

4. **GENERAL:**
   (i) Good.
   (ii) Nil.
   (iii) Yield of grain.
   (iv) (a) 1959—N.A.
   (b) N.A.
   (c) N.A.
   (v) to (vii) Nil.

5. **RESULTS:**
   (i) 3120 lb./ac.
   (ii) (a) 411.4 lb./ac.
   (b) 149.1 lb./ac.
   (iii) All the effects are highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
<th>$V_1$</th>
<th>$V_2$</th>
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<td>3302</td>
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S.E. of difference of two
1. $V$ marginal means = 145.4 lb./ac.
2. $N$ marginal means = 43.0 lb./ac.
3. $N$ means at the same level of $V$ = 105.4 lb./ac.
4. $V$ means at the same level of $N$ = 171.7 lb./ac.

**Crop**: Wheat (Rabi).

**Site**: Indian Agri. Res. Inst., New Delhi.

**Type**: C1.

Object — To study the effect of depths of cultivation and intercultures on the yield of Wheat.

1. **BASAL CONDITIONS**:
   (i) to (iii) N.A.
   (iv) As per treatments.
   (v) N.A.
   (vi) N.P.—718.
   (vii) Unirrigated.
   (viii) As per treatments.
   (ix) and (x) N.A.

2. **TREATMENTS**:
   All combinations of (1) and (2):
   (1) 3 depths of cultivation: $D_1$ = Tractor ploughing, 9' to 10' deep followed by grubbing and discing,
   $D_2$ = Victory ploughing 5' to 6' deep followed by country ploughing and
   $D_3$ = Surface cultivation by harrow.
   (2) 3 interculture treatments: $C_0$ = Control (no interculture), $C_1$ = Inter culture with bullock hoe and
   $C_2$ = Weeding with khurpi.

3. **DESIGN**:
   (i) Fact. in R.B.D.
   (ii) (a) 9.
   (b) N.A.
   (iii) 4.
   (iv) (a) N.A.
   (b) 50' x 12'.
   (v) N.A.
   (vi) Yes.

4. **GENERAL**:
   (i) and (ii) N.A.
   (iii) Yield of grain.
   (iv) (a) 1957—N.A.
   (b) N.A.
   (c) N.A.
   (v) to (vii) Nil.

5. **RESULTS**:
   (i) 315 lb./ac.
   (ii) 93.6 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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Crop: Wheat (Rabi).

Site: Indian Agri Res. Instt., New Delhi.

Ref: I.A.R.I. 58(14).

Type: 'C'.

Object: To study the effect of depths of cultivation and intercultures on the yield of Wheat.

1. BASAL CONDITIONS to 4. GENERAL:

Same as in exp't no. 57(12) on page 331.

5. RESULTS:

(i) 622 lb./ac.  (ii) 198.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

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</table>

Mean 567 616 653 612

S.E. of any marginal mean = 57.4 lb./ac.

S.E. of body of table = 99.4 lb./ac.

Crop: Wheat (Rabi).


Ref: I.A.R.I. 57(13).

Type: 'C'.

Object: To study the effect of different seed rates, sowing dates and spacings of Hubam clover sown mixed with Wheat.

1. BASAL CONDITIONS:

(i) and (ii) N.A. (iii) As per treatments. (iv) (a) 1 Victory ploughing, 1 dead ploughing and 1 discing with tractor. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 3 weedings and 1 roguing. (ix) N.A. (x) 5.4.1958 and 10.5.1958.

2. TREATMENTS:

All combinations of (1), (2) and (3)

(1) 2 dates of sowing: D₁ = 5th Nov, and D₂ = 20th Nov.
(2) 2 seed rates of Hubam clover: R₁ = 10 lb./ac. and R₂ = 15 lb./ac.
(3) 2 spacings: S₁ = 6" between wheat rows and S₂ = Broadcast.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 8, (b) N.A. (iii) 4. (iv) (a) and (b) 29'×18'5". (v) Nil. (vi) Yea.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1957—N.A. (b) N.A. (c) Nil. (d) and (vi) Nil. (vii) Yield data for Hubam clover N.A.

5. RESULTS:

(i) 2308 lb./ac. (ii) 383.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.
Crop: Wheat (Rabi).

Object: To study the effect of different dates of sowing, seed rates and spacings of Hubam clover sown mixed with Wheat.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) As per treatments. (iv) (a) Victory ploughing and 3 deshi ploughings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 2 weedicngs. (ix) N.A. (x) 8.4.1959.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 57(13) on page 332.

3. RESULTS:
   (i) 1129 lb./ac. (ii) 385.2 lb./ac. (iii) Main effect of D alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>Mean</th>
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<td>1180</td>
<td>1129</td>
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</tbody>
</table>

S.E. of any marginal mean = 96.3 lb./ac.
S.E. of body of any table = 136.2 lb./ac.

Crop: Wheat (Rabi).

Object: To assess the soil fertility status built up by the phosphate-manured berseem during last three years on the yield of Wheat crop in different crop rotation.

1. BASAL CONDITIONS:
   (i) (a) As per treatments. (b) Berseem during rabi seasons of 1954, 1955 and 1956 and as per treatments in kharif 1956. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 13.11.1957. (iv) (a) Ploughing by Victory plough, 2 discings by tractor plough and 1 grubbing. (b) Seed drilled. (c) to (e) N.A. (v) N.A. (vi) Irrigated. (vii) 1 hand hoeing. (ix) N.A. (x) 14.4.1958.
2. TREATMENTS:

Main-plot treatments:
2 crop rotations: \( R_1 = \text{Cowpea–Wheat} \) and \( R_2 = \text{Fallow–Wheat} \).

Sub-plot treatments:
13 manurial treatments: \( M_0 = \text{No manure} \), \( M_1 = \text{No manure and fallow in rabi} \), \( M_2 = \text{16 lb./ac. of } P_2O_5 \) as F.Y.M., \( M_3 = \text{32 lb./ac. of } P_2O_5 \) as F.Y.M., \( M_4 = \text{Super at 8 lb./ac. of } P_2O_5 \), \( M_5 = \text{Super at 8 lb./ac. of } P_2O_5 + \text{F.Y.M. at 32 lb./ac. of } P_2O_5 \), \( M_6 = \text{64 lb./ac. of } P_2O_5 \) as Super, \( M_7 = \text{Super at 8 lb./ac. of } P_2O_5 + \text{F.Y.M. at 8 lb./ac. of } P_2O_5 \), \( M_8 = \text{Super at 8 lb./ac. of } P_2O_5 + \text{F.Y.M. at 24 lb./ac. of } P_2O_5 \), \( M_9 = \text{Super at 8 lb./ac. of } P_2O_5 + \text{F.Y.M. at 32 lb./ac. of } P_2O_5 \), \( M_{10} = \text{Super at 8 lb./ac. of } P_2O_5 + \text{F.Y.M. at 40 lb./ac. of } P_2O_5 \), \( M_{11} = \text{Super at 8 lb./ac. of } P_2O_5 + \text{F.Y.M. at 64 lb./ac. of } P_2O_5 \), \( M_{12} = \text{Super at 8 lb./ac. of } P_2O_5 + \text{F.Y.M. at 8 lb./ac. of } P_2O_5 \).

Manures applied to berseem crop during the rabi seasons of 1954, 1955 and 1956.

3. DESIGN:

(i) Split-plot.
(ii) (a) 2 main-plots/replication; 13 sub-plots/main-plot.
(b) N.A.
(iii) 3.
(iv) (a) 65' x 17'.
(b) 60' x 12'.
(c) 2.5' x 2.5'.
(d) Yes.

4. GENERAL:

(i) Good.
(ii) Slight attack of loose smut and rats.
(iii) Grain yield.
(iv) to (vii) N.A.

5. RESULTS:

(i) 1728 lb./ac.
(ii) 381.2 lb./ac.
(iii) 203.3 lb./ac.
(iv) Main effect of M is highly significant.
(v) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>M_4</th>
<th>M_5</th>
<th>M_6</th>
<th>M_7</th>
<th>M_8</th>
<th>M_9</th>
<th>M_10</th>
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<td>1927</td>
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<td>1911</td>
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S.E. of difference of two

1. R marginal means
2. M marginal means
3. M means at the same level of R
4. R means at the same level of M

Ref: I.A.R.I. 58(12).

Type: CM.

Crop: Wheat (Rabi).


Object: To assess the soil fertility status built up by the phosphate manured berseem (during previous years on the yield of Wheat crop in different crop rotations.

1. BASAL CONDITIONS:

(i) As per treatments.
(ii) Berseem during rabi seasons of 1954, 1955 and 1956 and as per treatments.

main kharif 1956 on words.

(c) As per treatments.
(ii) (a) and (b) N.A.
(iii) 5.11.1958.
(iv) (a) 3 ploughings.
(b) Sowing by drilling.
(c) to (e) N.A.
(v) Nil.
(vi) N.A.
(vii) Irrigated.
(viii) 1 hoeing.
(ix) N.A.
(x) 6 to 8.4.1959.

2. TREATMENTS:

Same as in exp. no. 57(9) on page 333.

3. DESIGN:

(i) Split-plot.
(ii) (a) 2 main-plots/replication.

13 sub-plots/main-plot.
(b) N.A.
(iii) 3.
(iv) (a) 65' x 17'.
(b) 59' x 11'.
(c) 3' x 3'.
(d) Yes.

4. GENERAL:

(i) Good.
(ii) Nil.
(iii) Yield of grain.
(iv) to (vii) N.A.
5. RESULTS:

(i) 1800 lb./ac.  (ii) (a) 689.3 lb./ac.  (b) 275.0 lb./ac.  (iii) Main effect of M is highly significant and interaction R x M is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>R</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
<th>M11</th>
<th>M12</th>
<th>Mean</th>
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<td>1451</td>
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<td>1556</td>
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<td>2021</td>
<td>1717</td>
<td>1633</td>
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<tr>
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<td>2321</td>
<td>2052</td>
<td>1762</td>
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<td>2120</td>
<td>1689</td>
<td>1686</td>
<td>2316</td>
<td>2097</td>
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<td>1428</td>
<td>1476</td>
<td>2354</td>
<td>2059</td>
<td>2142</td>
<td>1800</td>
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</table>

S.E. of difference of two

1. R marginal means  = 156.1 lb./ac.
2. M marginal means  = 158.8 lb./ac.
3. M means at the same level of R  = 224.5 lb./ac.
4. R means at the same level of M  = 266.3 lb./ac.

---

Crop -> Wheat  
Ref -> I.A.R.I. 59(4).

Object: To assess the soil fertility status built up by the phosphate manured berseem during previous years on the yield of Wheat crop in different crop rotation.

1. BASAL CONDITIONS:

(i) (a) As per treatments.  (b) Berseem during rabi seasons of 1954, 1955 and 1956 and as per treatments from kharif 1956 onwards.  (c) As per treatments.  (ii) (a) and (b) N.A.  (iii) 12.11.1939.  (iv) (a) 1 Victory ploughing, 1 discing by bullock, 2 discing with tractor, 1 tractor grubbing and 1 desi plough.  (b) to (e) N.A.  (v) N.A.  (vi) C -> 518.  (vii) Irrigated.  (viii) and (a) N.A.  (a) 16 to 18.4.1960.

2. TREATMENTS:

Same as in expt. no. 57(9) on page 333.

3. DESIGN:

(i) Split-plot.  (ii) (a) 2 main-plots/replication ; 13 sub-plots/main-plot.  (b) N.A.  (iii) 3.  (iv) (a) 63' x 17'.  (b) 63' x 15'.  (v) 1' x 1'.  (vi) Yes.

4. GENERAL:

(i) Good.  (ii) N.I.  (iii) Yield of grain.  (iv) to (vii) N.A.

5. RESULTS:

(i) 1889 lb./ac.  (ii) (a) 435.1 lb./ac.  (b) 267.3 lb./ac.  (iii) Main effect of M alone is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>R</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
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<td>1635</td>
<td>1395</td>
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<tr>
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<td>1473</td>
<td>1312</td>
<td>1297</td>
<td>1189</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. R marginal means  = 98.5 lb./ac.
2. M marginal means  = 154.3 lb./ac.
3. M means at the same level of R  = 218.2 lb./ac.
4. R means at the same level of M  = 231.7 lb./ac.
Object:—To study the effect of different crops grown in previous season on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 27.10.1954. (iv) (a) 4 ploughings and 1 harrowing.
   (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedicings. (ix) N.A. (x) 4.4.1955.

2. TREATMENTS:
   7 crop rotations: 
   \[ R_1 = \text{Maize—Fallow}, \quad R_2 = \text{Maize—Pea}, \quad R_3 = \text{Fallow—Wheat}, \quad R_4 = \text{Fallow—Wheat+20 lb./ac. of N as A/S,} \]
   \[ R_5 = \text{Maize+10 tons/ac. of FYM—Wheat,} \quad R_6 = \text{Guar (G.M.)—Wheat,} \]
   \[ R_7 = \text{Cowpea—Wheat and R_8 = Maize+Guar (G.M.) in alternate rows—Wheat.} \]

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 33'x31'. (b) 31'x29'. (v) 1’x1’. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 763 lb./ac. (ii) 93.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment  \[ R_1 \quad R_2 \quad R_3 \quad R_4 \quad R_5 \quad R_6 \quad R_7 \]
   Av. yield — — 790 1004 684 988 573 541
   S.E./mean = 38.2 lb./ac.

Object:—To study the effect of F.Y.M., A/S and crop rotations on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 1.11.1955. (iv) (a) 1 Victory ploughing, 2 desl
   ploughings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 10.4.1956.

2 TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(17) above.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1469 lb./ac. (ii) 266 0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment  \[ R_1 \quad R_2 \quad R_3 \quad R_4 \quad R_5 \quad R_6 \quad R_7 \]
   Av. yield — — 1518 1760 1336 1728 1421 1236
   S.E./mean = 108.6 lb./ac.
1. BASAL CONDITIONS:
(i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 9.11.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) I weeding. (ix) and (x) N.A.

2. TREATMENTS:

Male-plot treatments:
3 crop rotations: R₁ = Bajra-Wheat, R₂ = Fallow-Wheat and R₃ = Bajra-Fallow.

Sub-plot treatments:
5 levels of F.Y.M.: F₀ = 0, F₁ = 2.5, F₂ = 10 and F₃ = 20 tons/ac.

Sub-sub-plot treatments:
3 levels of N as A/S: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication, 5 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 58’x25’. (b) 1/31.34 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 15.85 lb./ac. (ii) (a) 636.7 lb./ac. (b) 247.5 lb./ac. (c) 227.5 lb./ac. (iii) Mean yield of grain in lb./ac.

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<th>F₁</th>
<th>F₂</th>
<th>F</th>
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S.E. of difference of two
1. R marginal means = 134.1 lb./ac. 6. N means at the same level of R = 83.1 lb./ac.
2. F marginal means = 82.5 lb./ac. 7. R means at the same level of N = 150.4 lb./ac.
3. N marginal means = 58.7 lb./ac. 8. N means at the same level of F = 131.4 lb./ac.
4. F means at the same level of R = 116.7 lb./ac. 9. F means at the same level of N = 135.3 lb./ac.
5. R means at the same level of F = 170.0 lb./ac.

Crop :: Wheat (Rabi).
Site :: Indian Agri. Res. Instt., New Delhi.

Object :: To study the effect of Azatobacter seed culture alone and in combination with manures on Wheat.

1. BASAL CONDITIONS:
(i) to (x) N.A.

2. TREATMENTS:

9 treatments: T₀ = Control, T₁ = F.Y.M. at 5 tons/ac., T₂ = Azatobacter seed culture, T₃ = Azatobacter seed culture + cellulose decomposing organism, T₄ = F.Y.M. + Azatobacter seed culture, T₅ = T₄ + cellulose decomposing organism, T₆ = Super, T₇ = Super + Azatobacter seed culture and T₈ = T₇ + cellulose decomposing organism.

Azatobacter seed culture is carried out through two methods Indian and Russian.

3. DESIGN:
(i) R.B.D. (ii) (a) 8 for each method of seed culture. (b) N.A. (iii) 4. (iv) (a) For Indian culture: 27.3’x20’ and for Russian 21.3’x20’. (b) For Indian culture: 25.3’x18’ and for Russian 19.3’x18’. (v) 1’x1’. (vi) Yes.

Ref :: I.A.R.I. ’59(6).
Type :: ‘CM’.
4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Indian culture

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
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<td>1427</td>
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<td>S.E./mean</td>
<td>129.4 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Russian culture

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1771</td>
<td>1742</td>
<td>1746</td>
<td>1871</td>
<td>1900</td>
<td>1738</td>
<td>1638</td>
<td>1644</td>
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<tr>
<td>S.E./mean</td>
<td>132.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Crop: Wheat (Rabi).


Ref.: I.A.R.I. 55(10).

Type: 'CM'.

Object: To study the effect of Hubam clover as a mixed crop in Wheat—Maize rotation.

1. BASAL CONDITIONS:
(i) (a) to (c) As per treatments. (ii) to (x) N.A.

2. TREATMENTS:
12 crop rotations with manuring: T1 = Fallow—Wheat, T2 = Maize—Fallow, T3 = Maize with 30 lb./ac. of N—Wheat, T4 = Maize with 30 lb./ac. of N—Wheat with 30 lb./ac. of P2O5 to Hubam clover for fodder and G.M., T5 = T4 with 30 lb./ac. of P2O5 to Hubam clover, T6 = Maize—Wheat + Hubam clover for G.M. alone, T7 = T5 with 80 lb./ac. of P2O5 to Hubam clover, T8 = Maize—Hubam clover for G.M. alone, T9 = T6 with 80 lb./ac. of P2O5 to Hubam clover, T10 = T7 with 80 lb./ac. of P2O5 to Hubam clover, T11 = Maize—Hubam clover for G.M. and T12 = Sannkemp for G.M.—Wheat. Hubam clover mixed with soil before sowing the wheat crop.

3. DESIGN:
(i) R.B.D. (ii) (a) 12 (effective treatments 10 for wheat crop). (b) N.A. (iii) 4. (iv) (a) N.A. (b) 63°×115°. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of wheat grain. (iv) (a) 1955—cond. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
<th>T12</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1548</td>
<td>1398</td>
<td>2215</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1548</td>
<td>1398</td>
<td>2215</td>
</tr>
</tbody>
</table>

S.E./mean = 366.2 lb./ac.
Crop: Wheat (Rabi).
Ref: I.A.R.I. 56(12).
Type: ‘CM’.

Object: To study the effect of Hubam clover as a mixed crop in Wheat–Maize rotation.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) and (b) N.A.  (iii) 1.11.1955.  (iv) (a) 3 ploughings and 3 grubblings.  (b) to (e) N.A.  (v) N.A.  (vi) N.P.—718.  (vii) Irrigated.  (viii) 1 weeding.  (ix) N.A.  (x) 24.4.1957.

2. TREATMENTS:
12 crop rotations with manuring: T1 = Fallow—Wheat, T2 = Maize—Wheat with 40 lb./ac. of N as A/S, T3 = Maize with 40 lb./ac. of N as A/S—Wheat, T4 = Maize with 40 lb./ac. of N as A/S—Wheat with 40 lb./ac. of N as A/S, T5 = Maize—Wheat + Hubam clover for fodder and G.M., T6 = T5 with 40 lb./ac. of N as A/S, T7 = T5 with 80 lb./ac. of P₂O₅ to Hubam clover, T8 = Maize—Wheat + Hubam clover for G.M. only, T9 = T8 with 40 lb./ac. of N as A/S to maize, T10 = T8 with 80 lb./ac. of P₂O₅ to Hubam clover, T11 = Maize—Hubam clover for G.M. and T12 = Sannrp for G.M.—Wheat.

Hubam clover mixed with soil before sowing the Wheat crop.

3. DESIGN:
(i) R.B.D.  (ii) (a) 12 (effective treatments 11 for wheat crop).  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 63’x11’.

4. GENERAL:
(i) Good.  (ii) Nil.  (iii) Yield of wheat grain.  (iv) (a) 1955—contd.  (b) Yes.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
(i) 925 lb./ac.  (ii) 325.9 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
<th>T12</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>1154</td>
<td>1186</td>
<td>571</td>
<td>1351</td>
<td>748</td>
<td>629</td>
<td>724</td>
<td>891</td>
<td>655</td>
<td>981</td>
<td>1281</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>163.0 lb./ac.</td>
<td></td>
<td></td>
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</tbody>
</table>

Crop: Wheat (Rabi).
Ref: I.A.R.I. 57(14).
Type: ‘CM’.

Object: To study the effect of Hubam clover as a mixed crop in Wheat–Maize rotation.

1. BASAL CONDITIONS:
(i) (a) to (c) As per treatments.  (ii) (a) and (b) N.A.  (iii) 9.11.1957.  (iv) (a) 1 ploughing by Victory plough, 3 discings and 1 planking by tractor.  (b) to (e) N.A.  (v) and (vi) N.A.  (vii) Irrigated.  (viii) 1 hoing and 1 weeding.  (ix) N.A.  (x) 4.4.1958.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 56(12) above.

5. RESULTS:
(i) 1790 lb./ac.  (ii) 353.4 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
<th>T12</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>1958</td>
<td>2205</td>
<td>1395</td>
<td>2149</td>
<td>1591</td>
<td>1526</td>
<td>1573</td>
<td>1634</td>
<td>1545</td>
<td>1884</td>
<td>—</td>
<td>2235</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>176.7 lb./ac.</td>
<td></td>
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</tr>
</tbody>
</table>
Crop - Wheat (Rabi).


Object: To study the effect of Hubam clover as a mixed crop in Wheat—Maize rotation.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 13.11.1958. (iv) (a) 1 Victory ploughing, 2 discings and 2 dess ploughings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (a) 14 and 15.4.1959.

2. TREATMENTS to 4.

5. RESULTS:
   (i) 2240 lb./ac. (ii) 314.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment  
   T1  T2  T3  T4  T5  T6  T7  T8  T9  T10  T11  T12
   Av. yield 2430 2473 1985 2556 1947 1967 1960 1711 1867 2992 89 - 2919
   S.E./mean = 162.1 lb./ac.
1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) As per treatments. (iv) (a) 1 Victory ploughing, 2 desi ploughings, 1 tractor double discing and 1 tractor double grubbing. (b) Transplanted. (c) N.A. (d) As per treatments. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 3 hoeings and 1 weeding. (ix) N.A. (x) 15.4.1960 to 19.4.1960.

2. TREATMENTS:
All combinations of (1), (2) and (3)+3 extra treatments
(1) 3 dates of transplanting: \( D_1 \) =Nursery sown on 18th Oct. and transplanted on 2nd Dec., \( D_2 \) =Nursery sown on 2nd Nov. and transplanted on 17th Dec., and \( D_3 \) =Nursery sown on 17th Nov. and transplanted on 2nd January.
(2) 3 spacings: \( S_1 =10" \times 10" \), \( S_2 =15" \times 6" \) and \( S_3 =20" \times 5" \).
(3) 3 levels of N: \( N_0 =0 \), \( N_1 =30 \) and \( N_2 =60 \) lb./ac.
Extra treatments: \( E_1 \) =Drilling of wheat on 18th Oct., \( E_2 \) =Drilling of wheat on 2nd Nov. and \( E_3 \) =Drilling of wheat on 17th Nov.

3. DESIGN:
(i) 3• confd. (\( DSN^2 \) and DSN are confd.). (ii) (a) 12 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 26' \times 21'. (b) 23' \times 16'. (v) 14' \times 11'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1959–1960. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1152 lb./ac. (ii) 239.7 lb./ac. (iii) Main effect of S is significant and "extra treatments vs. others" is highly significant. Interaction \( DSN^2 \) is significant. (iv) Av. yield of grain in lb./ac.
\[
\begin{array}{ccccccc}
\text{Crop:} & \text{Wheat (Rabi)} & \text{Ref:} & \text{I.A.R.I. 58(19).} \\
\text{Site:} & \text{Indian Agri. Res. Inst., New Delhi.} & \text{Type:} & \text{‘CM’} \\
\text{Object:} & \text{To study the effect of N, P and cultural treatments on the yield of Wheat.} \\
\text{1. BASAL CONDITIONS:} & \text{(i) and (ii) N.A. (iii) 1.12.1958. (iv) (a) Ploughing with tripahil. (b) to (e) N.A. (v) 30 lb./ac. of N as A/S. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.} \\
\text{2. TREATMENTS:} & \text{All combinations of (1) and (2)} \\
(1) 5 manurial treatments: \( M_0 \) =Control, \( M_1 =30 \) lb./ac. of N as F.Y.M., \( M_2 =M_1 +60 \) lb./ac. of \( P_2 O_5 \) as Super, \( M_3 =M_1 +60 \) lb./ac. of \( P_2 O_5 \) as Rock Phos. and \( M_4 =M_1 +60 \) lb./ac. of \( P_2 O_5 \) as B.M. \\
(2) 4 cultural treatments: \( C_0 \) =No bacterial culture, \( C_1 \) =Phospho bacteria, \( C_2 \) =Fosfo 24 and \( C_3 \) =Indian culture. \\
\end{array}
\]
3. **DESIGN:**
   (i) Fact. in R.B.D  
   (ii) (a) 20.  (b) N.A.  
   (iii) 4. (iv) and (v) N.A.  
   (vi) Yes.

4. **GENERAL:**
   (i) Normal.  
   (ii) N.A.  
   (iii) Yield of grain.  
   (iv) (a) 1958—N.A.  
   (b) No. (c) Nil.  
   (v) to (vii) Nil.

5. **RESULTS:**
   (i) 2013 lb./ac.  
   (ii) 362.0 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>Mean</th>
</tr>
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<td>C₀</td>
<td>1629</td>
<td>2337</td>
<td>2032</td>
<td>1983</td>
<td>1835</td>
<td>1963</td>
</tr>
<tr>
<td>C₁</td>
<td>1915</td>
<td>2106</td>
<td>1991</td>
<td>1991</td>
<td>2329</td>
<td>2068</td>
</tr>
<tr>
<td>C₂</td>
<td>2148</td>
<td>2189</td>
<td>1559</td>
<td>2090</td>
<td>2172</td>
<td>2028</td>
</tr>
<tr>
<td>C₃</td>
<td>2050</td>
<td>1769</td>
<td>2041</td>
<td>2057</td>
<td>1999</td>
<td>1991</td>
</tr>
</tbody>
</table>

Crop is: Wheat.  
Type: 'GM'.  
Ref: I.A.R.I. 54(19).

Object: To study the effect of depth of cultivation with and without F.Y.M. on the yield of Wheat.

1. ** BASAL CONDITIONS:**
   (i) (a) to (c) N.A.  
   (ii) (a) Heavy soil.  
   (b) N.A.  
   (iii) 211.1954.  
   (iv) (a) As per treatments.  
   (b) With kera.  
   (c) to (e) N.A.  
   (vi) and (vi) N.A.  
   (vii) Irrigated.  
   (viii) 4 weedings.  
   (ix) N.A.  
   (x) 19 and 20.4.1955.

2. **TREATMENTS:**
   ** Main-plot treatments:**
   4 cultural treatments:  
   C1 = Tractor ploughing 10" deep followed by tractor grubber,  
   C₂ = Bullock soil inverting plough 5" to 6" deep followed by country plough,  
   C₃ = 4" to 5" deep country plough and  
   C₄ = 3" to 4" deep tractor disc.

   **Sub-plot treatments:**
   4 levels of N as F.Y.M.:  
   N₀ = 0, N₁ = 40, N₂ = 80 and N₃ = 120 lb./ac.  
   F.Y.M. applied on 20 to 23.9.1954.

3. **DESIGN:**
   (i) Split-plot.  
   (ii) (a) 4 main-plots/replication; 4 sub-plots/main-plot.  
   (b) N.A.  
   (iii) 4. (iv) (a) 40'X27',  
   (b) 38'X25'. (v) 1'X1'. (vi) N.A.

4. **GENERAL:**
   (i) Germination was uniform.  
   Crop growth was normal except in C₄ plots.  
   (ii) N.A.  
   (iii) Yield of grain.  
   (iv) (a) 1950—1954.  
   (b) Yes. (c) N.A.  
   (v) to (vii) Nil.

5. **RESULTS:**
   (i) 2628 lb./ac.  
   (ii) 330.1 lb./ac.  
   (iii) 366.7 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C₁</td>
<td>2705</td>
<td>2831</td>
<td>2727</td>
<td>2544</td>
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<td>2452</td>
<td>2876</td>
<td>2590</td>
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<td>2613</td>
<td>2141</td>
<td>1901</td>
<td>2636</td>
<td>2598</td>
</tr>
</tbody>
</table>

Mean 2573 2673 2538 2730 2628
Object:—To study the effect of manuring on legumes under rainfed conditions and its residual effect on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 23.10.1959. (iv) (a) 5 ploughings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 28.3.1959.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Khurif</th>
<th>Manures</th>
<th>Rabi</th>
<th>Manures</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&lt;sub&gt;1&lt;/sub&gt;</td>
<td>Guar</td>
<td>No manure</td>
<td>Wheat</td>
</tr>
<tr>
<td>T&lt;sub&gt;2&lt;/sub&gt;</td>
<td>Guar</td>
<td>25 lb/ac. of P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>Wheat</td>
</tr>
<tr>
<td>T&lt;sub&gt;3&lt;/sub&gt;</td>
<td>Guar</td>
<td>50 lb/ac. of P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>Wheat</td>
</tr>
<tr>
<td>T&lt;sub&gt;4&lt;/sub&gt;</td>
<td>Guar</td>
<td>75 lb/ac. of P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>Wheat</td>
</tr>
<tr>
<td>T&lt;sub&gt;5&lt;/sub&gt;</td>
<td>Guar</td>
<td>25 lb/ac. of P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>Wheat</td>
</tr>
<tr>
<td>T&lt;sub&gt;6&lt;/sub&gt;</td>
<td>Guar</td>
<td>50 lb/ac. of P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>Wheat</td>
</tr>
<tr>
<td>T&lt;sub&gt;7&lt;/sub&gt;</td>
<td>Guar</td>
<td>75 lb/ac. of P&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;</td>
<td>Wheat</td>
</tr>
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<td>Wheat</td>
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<tr>
<td>T&lt;sub&gt;12&lt;/sub&gt;</td>
<td>Fallow</td>
<td>——</td>
<td>Wheat</td>
</tr>
</tbody>
</table>

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 26' x 22'. (b) 20' x 16'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Attack of white ants. (iii) Yield of grain. (iv) (a) N.A. (b) Yes. (c) N.A. (v) a' and (b) N.A. (vi) Nil. (vii) Crop severely damaged by the birds.

5. RESULTS:
   (i) 443 lb/ac. (ii) 278.6 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb/ac.

   Treatment | T<sub>1</sub> | T<sub>2</sub> | T<sub>3</sub> | T<sub>4</sub> | T<sub>5</sub> | T<sub>6</sub> | T<sub>7</sub> | T<sub>8</sub> | T<sub>9</sub> | T<sub>10</sub> | T<sub>11</sub> | T<sub>12</sub> |
   | Av. yield | 357 | 397 | 424 | 435 | 398 | 338 | 346 | 503 | 471 | 551 | 696 | 466 |
   | S.E./mean | —— | 113.7 lb/ac. |
2. TREATMENTS:

All combinations of (1), (2) and (3):
(1) 3 frequencies of irrigation: I$_1$=1, I$_2$=2 and I$_3$=4 irrigations.
(2) 3 levels of N as A/S: N$_0$=0, N$_1$=30 and N$_2$=60 lb/ac.
(3) 3 manural treatments: M$_0$=0, M$_1$=40 lb/ac. of P$_2$O$_5$ as Super and M$_2$=M$_1$+40 lb/ac. of K$_2$O as Pot. Sul.

3. DESIGN:
(i) 3 confd. (INM is completely confd.). (ii) (a) 3 blocks/replication and 9 plots/block. (b) N.A. (iii) 2.
(iv) (a) 49'x18'. (b) 1/19.6 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2821 lb/ac. (ii) 367.0 lb/ac. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>N$_0$</th>
<th>N$_1$</th>
<th>N$_2$</th>
<th>Mean</th>
<th>I$_1$</th>
<th>I$_2$</th>
<th>I$_3$</th>
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<td>2937</td>
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<td>M$_1$</td>
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<td>2960</td>
<td>2775</td>
<td>2718</td>
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<tr>
<td>M$_2$</td>
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<td>3011</td>
<td>2886</td>
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<td>2899</td>
<td>2821</td>
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S.E. of any marginal means = 86.5 lb/ac.
S.E. of body of any table = 149.8 lb/ac.

Crop: Wheat ('Rabi').
Ref: I.A.R.I. 58(23).
Type: 'IM'.
Object: To study the effect of different levels of N, P and irrigations on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) (b) and (b) N.A. (iii) 6.8.1958. (iv) (a) 4 ploughings and planking with wooden beam. (b) N.A. (c) 35 xrs/ac. (d) and (e) N.A. (f) Nil. (vii) N.P.—718. (viii) As per treatments. (ix) N.A. (x) 10, 11.4.1959.

2. TREATMENTS:
All combinations of (1), (2), (3), (4) and (5)
(1) 3 frequencies of irrigation: I$_1$=2, I$_2$=3 and I$_3$=4 irrigations.
(2) 3 depths of irrigation: D$_1$=2", D$_2$=3" and D$_3$=4" depth.
(3) 3 levels of N as A/S: N$_0$=0, N$_1$=30 and N$_2$=60 lb/ac.
(4) 3 levels of P$_2$O$_5$ as Super: P$_0$=0, P$_1$=30 and P$_2$=60 lb/ac.
(5) 3 levels of F$_2$O$_5$ as Super applied to wheat in 1957: Q$_0$=0, Q$_1$=30 and Q$_2$=60 lb/ac.

3. DESIGN:
(i) 3 confd. (ii) (a) 9 blocks of 9 plots each. (b) N.A. (iii) 'L'. (iv) (a) N/A. (b) 49'x15'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Slight attack of loose smut. (iii) Yield of grain. (iv) (a) 1957—contd. (b) Yes, (c) N/A. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 1777 lb./ac. (ii) 157.8 lb./ac. (iii) Main effect of N is highly significant and that of Q is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N</th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
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<td>1709</td>
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S.E. of any marginal mean = 30.4 lb./ac.
S.E. of body of any table = 52.6 lb./ac.

---

Crop: Wheat (Rabi).
Ref: I.A.R.I. 55(11).
Type: "IMV".

Object: To study the effect of irrigation and levels of N on different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 1.1.1955. (iv) (a) 1 Victory ploughing and 5 deep ploughings. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 24.4.1956.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 varieties: V1=N.P.—710, V2=N.P.—718 and V3=N.P.—775.
   (2) 3 levels of N as A/S: N0=0, N1=20 and N2=40 lb./ac.

3. DESIGN:
   (i) 3r confd. (VN11 and VN12 are confd.). (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 51'x18'. (b) 49'x16'. (v) 1'x1'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Dusting with BHC against white ants. (iii) Yield of grain. (iv) (a) 1952—1955. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1031 lb./ac. (ii) 207.2 lb./ac. (iii) Main effect of N is highly significant and that of V is significant. (iv) Av. yield of grain in lb./ac.
Crop = Wheat (*Rabi*).


Ref = I.A.R.I. 54(20).

Type = 'IMV'.

Object:— To study the effect of varying levels of irrigation and N on different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 17.11.1954. (iv) (a) 3 ploughings with desi plough and levelling. (b) N.A. (c) 70 lb./ac. (d) and (e) N.A. (v) 60 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings and interculturings. (ix) N.A. (x) 16 and 17.4.1955.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 varieties : V<sub>1</sub>=N.P.-710, V<sub>2</sub>=N.P.-718 and V<sub>3</sub>=N.P.-775.
   (2) 3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=20 and N<sub>2</sub>=60 lb./ac.
   (3) 3 frequencies of irrigation : I<sub>1</sub>=1, I<sub>2</sub>=2 and I<sub>3</sub>=3 irrigations.

3. DESIGN :
   (i) 3<sup>3</sup> confd. (ii) 3 blocks/replcation ; 9 plots/block. (b) N.A. (i) 2. (iv) (a) 51'x16'. (b) 46'x11'. (v) 2x'2x. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) White ants controlled with 5% BHC at 30 lb./ac. (iii) Yield of grain. (iv) (a) 1952—cond. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1846 lb./ac. (ii) 239.3 lb./ac. (iii) V effect is significant. I effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N&lt;sub&gt;0&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;</th>
<th>Mean</th>
<th>I&lt;sub&gt;1&lt;/sub&gt;</th>
<th>I&lt;sub&gt;2&lt;/sub&gt;</th>
<th>I&lt;sub&gt;3&lt;/sub&gt;</th>
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</tbody>
</table>
Crop: Wheat (Rabi).
Object: To study the effect of different levels of N and irrigation on different varieties of Wheat.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) Sandy loam. (iv) Ploughing, grubbing and discing. (b) Sandy loam. (v) Nil. (vi) and (vii) As per treatments. (viii) Nil. (ix) 16.69%.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N: N0 = 0, N1 = 20 and N2 = 40 lb./ac.
(2) 3 frequencies of irrigation: I1 = 1, I2 = 2 and I3 = 3 irrigations.
(3) 3 varieties: V1 = N.P.-Hy, V2 = N.P.-72 and V3 = N.P.-118.

3. DESIGN:
(i) 3 x 3 confd. (ii) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 32' x 20', (b) 30' x 18'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—N.A. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Raw data and two-way tables: N.A.

5. RESULTS:
(i) 1398 lb./ac. (ii) 237.6 lb./ac. (iii) Main effect of V is highly significant and that of N is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
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<tr>
<td>Av. yield</td>
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<td>1380</td>
<td>1575</td>
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<td>1442</td>
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<td>1398</td>
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</tbody>
</table>

S.E./mean = 56.4 lb./ac.

Crop: Wheat (Rabi).
Object: To study the effect of different levels of N and irrigation on different varieties of Paddy.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 14.11.1959. (iv) (a) 2 discings and 1 grubbing. (b) Sown by kera. (c) to (e) N.A. (vi) N.A. (vii) As per treatments (viii) Irrigated. (ix) 1 hand weeding. (x) N.A. (xi) 14 to 29.4.1960.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(2) 4 levels of N: N0 = 0, N1 = 20, N2 = 40 and N3 = 80 lb./ac.
(3) 4 frequencies of irrigation: I1 = 1, I2 = 2, I3 = 3 and I4 = 4 irrigations.

2. DESIGN:
(i) 4 x 4 confd. (ii) (a) 16 plots/block and 4 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 40' x 10', (b) 38' x 14'. (v) 1' x 1'. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1967 lb./ac. (ii) 295.5 lb./ac. (iii) Main effects of N and I are highly significant. V effect is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>Mean</th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
<th>I₄</th>
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<td>1713</td>
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<td>1791</td>
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<tr>
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<td>2014</td>
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<td>2098</td>
<td>1857</td>
<td>1922</td>
<td>1967</td>
<td>1847</td>
<td>1956</td>
<td>2052</td>
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S.E. of any marginal mean = 51.5 lb./ac.
S.E. of body of any table = 103.0 lb./ac.

_Crop:_ Wheat (Rabi).
_Ref:_ I.A.R.I. 58(21).
_Type:_ IC.

Object:—To study the effect of inter-row spacings and methods of irrigation on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 4.11.1958. (iv) (a) to (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) N.A. (vii) As per treatments. (viii) 2 weedings. (ix) N.A. (x) 6.4.1959,

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2)
(1) 3 methods of irrigation: M₁=Flat, M₂=Furrow before the first irrigation and M₃=Furrow after the first irrigation.
(2) 3 average inter-row spacings: S₁=9", S₂=10" and S₃=12" average.
Sub-plot treatments:
3 levels of irrigation: I₁=No irrigation after the root stage, I₂=One irrigation after the root stage when soil moisture tension in upper one foot layer exceeded 0.750 atmosphere and I₃=Two irrigations after the root stage when the soil moisture tension in upper two feet layer exceeded 0.750 atmosphere.

3. DESIGN:
(i) Split-plot. (ii) (a) 9 main-plot/replication; 3 sub-plot/main-plot. (b) N.A. (iii) 3. (iv) (a) 1'x40'. (b) 7'x30'. (v) 3x5'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) and (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 3058 lb./ac. (ii) (a) 406.8 lb./ac. (b) 243.9 lb./ac. (iii) Main effect of I alone is highly significant. (iv) Av. yield of grain in lb./ac.
Crop: Wheat (Rabi).
Type: ICM.

Object: To study the effect of different levels of N, irrigation and seed rate on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Potato—Cotton—Sugarcane—Wheat. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 9.11.1956. (iv) 1 Victory ploughing and 1 desi ploughing. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) 20 lb./ac. of P₂O₅ at sowing. (vi) N.P. 718 (medium). (vii) As per treatments. (viii) Weed. (ix) 3.82. (x) 15.4.957.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N₁=20, N₂=40 and N₃=60 lb./ac.
   (2) 3 depths of irrigation: I₁=6", I₂=9" and I₃=12".
   (3) 3 seed rates: S₁=40, S₂=60 and S₃=80 lb./ac.

3. DESIGN:
   (i) 3² confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 19' x 42' (b) 17.5' x 40'. (v) N.A. (vi) Yes.

4. GENERAL:

5. RESULTS:
   (i) 993 lb./ac. (ii) 174.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
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<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
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<th>I₂</th>
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S E. of difference of two
1. M or S marginal means
2. I marginal means
3. I means at the same level M or S
4. M or S means at the same level of I
S.E. of body of M x S table

Ref.: I.A.R.I. 56(14).
**Crop: Wheat (Rabi).**

**Site:** Indian Agri. Res. Instt., New Delhi.

**Object:** To study the effect of depths of irrigation, levels of nitrogen and seed rates on Wheat.

1. **BASAL CONDITIONS**
   
   (a) Nil. (b) and (c) N.A. (ii) and (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. **TREATMENTS**
   
   All combinations of (1), (2) and (3)

   (1) 3 depths of irrigation: $I_1 = 10\text{"}$, $I_2 = 13\text{"}$ and $I_3 = 16\text{"}$.
   (2) 3 levels of N: $N_1 = 20$, $N_2 = 40$ and $N_3 = 60 \text{ lb./ac.}$
   (3) 3 seed rates: $S_1 = 40$, $S_2 = 60$ and $S_3 = 80 \text{ lb./ac.}$

3. **DESIGN**

   (i) 3 x 3 conf. (ii) a) 9 plots/block; 3 blocks/replication. (v) N.A. (vi) Yes.

4. **GENERAL**

   (i) Very good. (ii) Nil. (iii) Yield of grain. (iv) (a) 195—1957. (v) and (vi) Nil. (vii) Treatments modified in 1957.

5. **RESULTS**

   (i) 1714 lb./ac. (ii) 124.0 lb./ac. (iii) Main effect of S alone s significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th>S2</th>
<th>S3</th>
<th>S4</th>
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</tr>
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<tr>
<td>1642</td>
<td>1750</td>
<td>1727</td>
<td>17.6</td>
</tr>
<tr>
<td>1630</td>
<td>1790</td>
<td>1767</td>
<td>17.9</td>
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<td>Mean</td>
<td>1664</td>
<td>1728</td>
<td>1750</td>
</tr>
<tr>
<td>$S_1$</td>
<td>$S_2$</td>
<td>$S_3$</td>
<td></td>
</tr>
<tr>
<td>1692</td>
<td>1800</td>
<td>1850</td>
<td></td>
</tr>
<tr>
<td>1618</td>
<td>1714</td>
<td>1710</td>
<td></td>
</tr>
<tr>
<td>1681</td>
<td>1669</td>
<td>1691</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 12.2 lb./ac.
S.E. of body of any table = 50.6 lb./ac.
2. TREATMENTS:

All combinations of (1), (2) and (3).

(1) 3 levels of irrigation: \( I_1 = \) Three irrigations of \( 2i, 2i \) and \( 2i \) (water deficit based on root length), \( I_2 = \) Three irrigations of \( 3i, 2i \) and \( 2i \) and \( I_3 = \) Three irrigations of \( 3i, 3i \) and \( 2i \) (cultivator practice as per water deficit in top 3' layer).

(2) 3 levels of \( N \) : \( N_0 = 0, N_1 = 30 \) and \( N_2 = 60 \) lb./ac.

(3) 2 methods of sowing: \( S_1 = \) Conventional system with \( 1' \) between double row and \( 6' \) in between them and \( S_2 = \) Flat system with \( 9' \) uniform spacing.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 46' × 14'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Due to rain and heavy wind the third irrigation was delayed by 3 days. 1” of rainfall was deducted before applying irrigation water.

5. RESULTS:

(i) 1371 lb./ac. (ii) 183.2 lb./ac. (iii) Main effect of \( N \) and interaction \( N \times S \) are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>Mean</th>
<th>( S_1 )</th>
<th>( S_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( I_1 )</td>
<td>993</td>
<td>1401</td>
<td>1718</td>
<td>1371</td>
<td>1354</td>
</tr>
<tr>
<td>( I_2 )</td>
<td>960</td>
<td>1499</td>
<td>1645</td>
<td>1358</td>
<td>1345</td>
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<tr>
<td>( I_3 )</td>
<td>992</td>
<td>1451</td>
<td>1695</td>
<td>1373</td>
<td>1375</td>
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<tr>
<td>Mean</td>
<td>982</td>
<td>1444</td>
<td>1686</td>
<td>1371</td>
<td>1358</td>
</tr>
<tr>
<td>( S_1 )</td>
<td>1048</td>
<td>1441</td>
<td>1594</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( S_2 )</td>
<td>914</td>
<td>1446</td>
<td>1788</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of \( I \) or \( N \) marginal mean = 37.4 lb./ac.
S.E. of \( S \) marginal mean = 30.5 lb./ac.
S.E. of body of \( I \times N \) table = 64.8 lb./ac.
S.E. of body of \( S \times N \) or \( S \times I \) table = 52.9 lb./ac.

Crop :- Wheat (Rabi).


Ref :- I.A.R.I. 57(16).

Type :- ‘DC’.

Object :- To study the efficacy of different weedicides alone and in conjunction with cultivation practices for the control of Baru weed in Wheat.

1. BASAL CONDITIONS:

(i) to (vii) N.A. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS:

All combinations of (1), (2), (3) and (4):

(1) 3 levels of 2, 4, 5-T : \( M_0 = 0, M_1 = 5 \) and \( M_2 = 10 \) lb./ac.

(2) 3 levels of 2, 4-D : \( D_0 = 0, D_1 = 5 \) and \( D_2 = 10 \) lb./ac.

(3) 3 levels of TCA : \( T_0 = 0, T_1 = 30 \) and \( T_2 = 60 \) lb./ac.

(4) 3 levels of cultivation : \( C_1 = 1, C_2 = 3 \) and \( C_3 = 6 \) cultivations.
3. **DESIGN:**
(i) Quasi L. Sq.  (ii) 9.  (b) N.A.  (iii) 1.  (iv) (a) 41' x 15'.  (b) 37' x 11.5'.  (v) N.A; (vi) Yes.

4. **GENERAL:**
(i) and (ii) N.A.  (iii) Yield of grain.  (iv) (a) and (b) N.A.  (c) Nil.  (v) and (vi) Nil.  (vii) Raw data and two-way tables : N.A.

5. **RESULTS:**
(i) 1665 lb./ac.  (ii) 230.7 lb./ac.  (iii) Main effects of M, D, T and C are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>D0</th>
<th>D1</th>
<th>D2</th>
<th>I0</th>
<th>T1</th>
<th>T2</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1423</td>
<td>1744</td>
<td>1827</td>
<td>1524</td>
<td>1631</td>
<td>1788</td>
<td>1928</td>
<td>1829</td>
<td>1936</td>
<td>1344</td>
<td>1451</td>
<td>2200</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 44.4 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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**Crop** : Wheat.
**Site** : Indian Agri. Res. Instt., New Delhi.

**Object** : To test the relative effectiveness of post and pre-emergence of 2, 4-D in various doses alone and in conjunction with cultural practices for controlling weeds in Wheat crop.

1. **BASAL CONDITIONS**:
(i) (a) Nil. (b) Savannah. (c) G.M. with Savannah.  (ii) (a) Heavy loam.  (b) N.A.  (iii) 13.11.1956.  (iv) (a) Ploughing with victory plough followed by desi plough.  (b) to (e) N.A.  (v) 30 lb./ac. of N as A/S applied with 1st irrigation.  (vi) N.P. 718.  (vii) Irrigated.  (viii) As per treatments.  (ix) 5.59'.  (x) 16.4.1957.

2. **TREATMENTS**:
10 weed-cidal treatments: W0=Control, W1=Hand weedig, W2=Hoeing, W3=Post-emergence spray with 2, 4-D at 8 ozs./ac. W4=Post-emergence spray with 2, 4-D at 1 lb./ac., W5=Post-emergence spray with 2, 4-D at 2 lb./ac., W6=Post-emergence spray with 2, 4-D at 8 ozs./ac.+hoeing, W7=Pre-emergence spray with 2, 4-D at 8 ozs./ac., W8=Pre-emergence spray with 2, 4-D at 1 lb./ac. and W9=Pre-emergence spray with 2, 4-D at 8 ozs./ac.+Post-emergence spray at 8 ozs./ac.

3. **DESIGN**:
(i) R.B.D.  (ii) 10.  (b) N.A.  (iii) 4.  (iv) (a) 18.5' x 21.75'.  (b) 14.5' x 18.75'.  (v) 2' x 1.5'.  (vi) Yes.

4. **GENERAL**:  
(i) Crop was damaged by hailstorm on 20.3.1957.  (ii) Nil.  (iii) No. of tillers, no. of grains per ear head and yield of grain.  (iv) (a) 1955—contd.  (b) Yes.  (c) Nil.  (v) to (vii) Nil.

5. **RESULTS**:
(i) 934 lb./ac.  (ii) 129.2 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W0</th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W4</th>
<th>W5</th>
<th>W6</th>
<th>W7</th>
<th>W8</th>
<th>W9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>880</td>
<td>1061</td>
<td>930</td>
<td>1004</td>
<td>1013</td>
<td>938</td>
<td>954</td>
<td>880</td>
<td>905</td>
<td>938</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 64.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop :- Wheat (Rabi).

Object :- To test the relative effectiveness of post and pre-emergence use of 2, 4-D in various doses alone and in conjunction with cultural practices for controlling weeds in Wheat.

1. BASAL CONDITIONS:
   (i) to (vii) N.A. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS:
   10 weedicidal treatments : W0= Control, W1= Hand weeding, W2= Hoeing with cultivator, W3= Post emergence 2, 4-D at 1 lb./ac., W4= Post emergence 2, 4-D at 1 lb./ac., W5= Post emergence 2, 4-D at 2 lb./ac., W6= Post emergence 2, 4-D at 1 lb./ac.+ hoeing, W7= Pre-emergence 2, 4-D at 1 lb./ac., W8= Pre-emergence 2, 4-D at 1 lb./ac. and W9=W0+W1.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 21.75' X 18.5'. (b) 18.75' X 16.5'. (v) 1.5' X 1'. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 1580 lb./ac. (ii) 146.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W0</th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W4</th>
<th>W5</th>
<th>W6</th>
<th>W7</th>
<th>W8</th>
<th>W9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1308</td>
<td>1777</td>
<td>1382</td>
<td>1687</td>
<td>1695</td>
<td>1572</td>
<td>1514</td>
<td>1563</td>
<td>1588</td>
<td>1712</td>
</tr>
</tbody>
</table>

S.E./mean = 73.2 lb./ac.

---

Crop :- Wheat.

Object :- To study the effect of different weedicides and cultural treatments on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 14.11.1959. (iv) (a) 1 tractor ploughing, 1 discing and 2 grubblings followed by beaming. (b) Drilling. (c) N.A. (d) 9". (e) N.A. (v) N.P. 718. (vi) Irrigated. (vii) As per treatments. (ix) N.A. (x) 11, 12.4.1960.

2. TREATMENTS:
   All combinations of (1), (2) and (3)+4 extra treatments
   (1) 3 weedicides : W1=Na-2, 4-D, W2=Amino 2, 4-D and W3=Ester 2, 4-D.
   (2) 2 levels of weedicides : L1=1 lb./ac. and L2=1 lb./ac.
   (3) 2 times of application : T1=Before irrigation and T2=After irrigation.
   Extra treatments : E0=Control, E1=1 hoeing, E2=1 hand weeding and E3=5 hand weedings.

3. DESIGN:
   (i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 13' X 20'. (b) 11' X 17'. (v) 1' X 1'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) Nil.

5. RESULTS:
   (i) 1962 lb./ac. (ii) 347.4 lb./ac. (iii) Main effect of W alone is significant. (iv) Av. yield of grain in lb./ac.
Crop - Wheat (Rabi).


Object:—To study the efficacy of T.C.A. and cultivations alone and in various combinations for controlling bari weed in Wheat.

1. BASAL CONDITIONS:
   (i) to (vii) N.A. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS:
   24 weedicidal treatments: T₁ = Control untreated followed by Wheat, T₂ = Control cultivated followed by Wheat, T₃ = 1 cultivation, T₄ = 3 cultivations, T₅ = 6 cultivations, T₆ = 15 lb./ac. of T.C.A., T₇ = 30 lb./ac. of T.C.A., T₈ = 60 lb./ac. of T.C.A., T₉ = 1 cultivation + 15 lb./ac. of T.C.A., T₁₀ = 1 cultivation + 15 lb./ac. of T.C.A., T₁₁ = 3 cultivations + 15 lb./ac. of T.C.A., T₁₂ = 6 cultivations + 15 lb./ac. of T.C.A., T₁₃ = 1 cultivation + 30 lb./ac. of T.C.A., T₁₄ = 3 cultivations + 30 lb./ac. of T.C.A., T₁₅ = 6 cultivations + 30 lb./ac. of T.C.A., T₁₆ = 1 cultivation + 60 lb./ac. of T.C.A., T₁₇ = 3 cultivations + 60 lb./ac. of T.C.A., T₁₈ = 6 cultivations + 30 lb./ac. of T.C.A., T₁₉ = 6 cultivations + 30 lb./ac. of T.C.A., T₂₀ = 1 cultivation + 30 lb./ac. of T.C.A., T₂₁ = 3 cultivations + 30 lb./ac. of T.C.A., T₂₂ = 6 cultivations + 30 lb./ac. of T.C.A., T₂₃ = 30 lb./ac. of T.C.A. + 5 lb./ac. of 2, 4-D, T₂₄ = 6 cultivations + 30 lb./ac. of T.C.A. + 5 lb./ac. of 2, 4-D, T₂₅ = 6 cultivations + 15 lb./ac. of T.C.A. + 10 lb./ac. of 2, 4-D, T₂₆ = 6 cultivations + 15 lb./ac. of T.C.A. + 10 lb./ac. of 2, 4-D, T₂₇ = 6 cultivations + 15 lb./ac. of T.C.A. + 10 lb./ac. of 2, 4-D, T₂₈ = 6 cultivations + 15 lb./ac. of T.C.A. + 10 lb./ac. of 2, 4-D, T₂₉ = 6 cultivations + 15 lb./ac. of T.C.A. + 10 lb./ac. of 2, 4-D.

3. DESIGN:
   (i) R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) 50' x 15'. (b) 26' x 15'. (v) 2' x 6'. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. conducted at Agri. Sub-Stn., Kurali.

5. RESULTS:
   (i) 759 lb./ac. (ii) 1594 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
<th>T₁₀</th>
<th>T₁₁</th>
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<tr>
<td>Av. yield</td>
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<table>
<thead>
<tr>
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<th>T₁₃</th>
<th>T₁₄</th>
<th>T₁₅</th>
<th>T₁₆</th>
<th>T₁₇</th>
<th>T₁₈</th>
<th>T₁₉</th>
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<th>T₂₁</th>
<th>T₂₂</th>
<th>T₂₃</th>
<th>T₂₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

S.E./mean = 79.7 lb./ac.
Crop: Wheat (Rabi).


Ref: I.A.R.I. 56(15).

Type: ‘DCM’.

Object: To study the effect of 2, 4-D-B on weed population in Wheat crop alone and in combination with different cultivation levels and different forms of N.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Mucuna chinos. (c) N.A. (ii) (a) Medium loam. (b) N.A. (iii) 10.11.1956. (iv) (a) to (c) N.A. (v) Nil. (vi) N.F.—718. (vii) As per treatments. (ix) 5.59. (x) 18.4.1957.

2. TREATMENTS:
All combinations of (1) and (2)

Main-plot treatments:
(1) 3 levels of 2, 4-D Butyric acid: D0 = 0, D1 = 8 and D2 = 16 ozs./ac.
(2) 3 levels of cultivation: C0 = 0, C1 = 1 and C2 = 2 hoeings.

Sub-plot treatments:
3 forms of application of 30 lb./ac. of N: S0 = 0, S1 = A/S in solid form and S2 = A/S in liquid form.

3. DESIGN:
(i) Split-plot. (ii) (a) 9 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 28' x 16'. (b) 24' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Some lodging was caused by hailstorm on 20.3.1957. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—N.A. (b) N.A. (c) Nil. (v) and (vi) Nil. (vii) Raw-data and two-way tables are not available.

5. RESULTS:
(i) 1347 lb./ac. (ii) (a) 315.6 lb./ac. (b) 244.8 lb./ac. (iii) Main effects of D and S are highly significant.
(iv) Av. yield of grain in ib./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D0</th>
<th>D1</th>
<th>D2</th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1152</td>
<td>1339</td>
<td>1349</td>
<td>1404</td>
<td>1306</td>
<td>1337</td>
<td>1103</td>
<td>1391</td>
<td>1547</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. C or D marginal means 74.4 lb./ac.
2. S marginal means 57.7 lb./ac.

Crop: Wheat.


Ref: I.A.R.I. 57(18).

Type: ‘DCM’.

Object: To study the effect of 2, 4-D-B on weeds in Wheat, in combination with different cultivation levels and forms of N.

1. BASAL CONDITIONS:
(i) to (vii) N.A. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2)
(1) 3 levels of 2,4-D : D0 = 0, D1 = 1 and D2 = 1 lb./ac.
(2) 3 levels of cultivation: C0 = 0, C1 = 1 and C2 = 2 cultivations.

Sub-plot treatments:
3 sources of 30 lb./ac. of N: S0 = No N, S1 = A/S applied as solid and S2 = A/S applied as liquid.

3. DESIGN:
(i) Split-plot. (ii) (a) 9 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 24' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 2468 lb./ac.  (ii) (a) 304.9 lb./ac.  (b) 258.4 lb./ac. (iii) Main effects of P and S are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$D_0$</th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>Mean</th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_0$</td>
<td>2102</td>
<td>2587</td>
<td>2659</td>
<td>2649</td>
<td>2258</td>
<td>2651</td>
<td>2439</td>
</tr>
<tr>
<td>$C_1$</td>
<td>2320</td>
<td>2438</td>
<td>2492</td>
<td>2417</td>
<td>2162</td>
<td>2571</td>
<td>2517</td>
</tr>
<tr>
<td>$C_2$</td>
<td>2408</td>
<td>2619</td>
<td>2585</td>
<td>2337</td>
<td>2219</td>
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<tr>
<td>Mean</td>
<td>2277</td>
<td>2548</td>
<td>2579</td>
<td>2668</td>
<td>2246</td>
<td>2612</td>
<td>2544</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D or C marginal means = 71.9 lb./ac.
2. S marginal means = 60.9 lb./ac.
3. $S$ means at the same level of $D$ or $C$ = 105.1 lb./ac.
4. D or C means at the same level of $S$ = 231.0 lb./ac.
S.E. of body of $D \times C$ table = 88.0 lb./ac.

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**Crop:** Wheat (*Rabi*).

**Site:** Indian Agric. Res. Instt., New Delhi.

**Type:** DCM.

**Ref:** I.A.R. 58(17).

**Object:** To study the effect of 2,4-D-B on weed population in wheat crop alone and in combination with different cultivation levels and different forms of application of A/S.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) Nov., 1958. (iv) (a) to (e) N.A. (v) Nil. (vi) to (ix) N.A. (X) March, 1959.

2. **TREATMENTS:**
   Same as in exp. no. 56(15) on page 355.

3. **DESIGN:**
   (i) Split-plot. (ii) (a) 9 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 10' x 26'. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956 — N.A. (b) N.A. (c) Nil. (v) and (vi) Nil. (vii) Raw data and two-way tables are not available.

5. **RESULTS:**
   (i) 1578 lb./ac. (ii) (a) 272.4 lb./ac. (b) 240.1 lb./ac. (iii) Main effects of D and S are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$D_0$</th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>$C_0$</th>
<th>$C_1$</th>
<th>$C_2$</th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1739</td>
<td>1538</td>
<td>1466</td>
<td>1512</td>
<td>1577</td>
<td>1645</td>
<td>1029</td>
<td>1981</td>
<td>1723</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. C or D marginal means = 64.2 lb./ac.
2. S marginal means = 55.6 lb./ac.
Object — To study the effect of Hubam clover grown with P for seed, fodder and G.M. on the succeeding Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Maize — Hubam clover. (b) Hubam clover. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 23.7.1954. (iv) (a) 2 dicings. (b) to (e) N.A. (v) N.A. (vi) Yellow no. 2. (vii) Irrigated. (viii) 1 hoeing with horse hoe, 1 weeding and 1 thinning. (ix) N.A. (x) 2.11.1954.

2. TREATMENTS:
   Main-plot treatments: 4 levels of P₂O₅ applied to Hubam clover: P₀ = 0, P₁ = 40, P₂ = 80 and P₃ = 120 lb./ac.
   Sub-plot treatments: 6 forms of Hubam clover: G₁ = Hubam clover grown for seed, G₂ = Hubam clover grown for G.M., G₃ = Hubam clover grown for G.M. after 1 cut, G₄ = Hubam clover grown for G.M. after 2 cuts and G₅ = Hubam clover grown for fodder.

3. DESIGN:
   (i) Split plot. (ii) 4 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (a) and (b) 1/100 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Attack of stem borer. (iii) Yield of grain. (iv) (a) 1955—1956. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 170 lb./ac. (ii) (a) 311.9 lb./ac. (b) 243.8 lb./ac. (iii) Main effect of G alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>G₁</th>
<th>G₂</th>
<th>G₃</th>
<th>G₄</th>
<th>G₅</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2273</td>
<td>1833</td>
<td>2310</td>
<td>1567</td>
<td>1467</td>
<td>1587</td>
</tr>
<tr>
<td>1900</td>
<td>1880</td>
<td>2100</td>
<td>1700</td>
<td>1350</td>
<td>1677</td>
</tr>
<tr>
<td>2000</td>
<td>1613</td>
<td>2090</td>
<td>1483</td>
<td>1343</td>
<td>1567</td>
</tr>
<tr>
<td>2145</td>
<td>1840</td>
<td>1930</td>
<td>1457</td>
<td>1443</td>
<td>1500</td>
</tr>
<tr>
<td>Mean</td>
<td>2080</td>
<td>1796</td>
<td>2113</td>
<td>1542</td>
<td>1699</td>
</tr>
</tbody>
</table>

   S.E. of difference of two
   1. P marginal means = 104.0 lb./ac.
   2. G marginal means = 99.5 lb./ac.
   3. G means at the same level of P = 199.1 lb./ac.
   4. P means at the same level of G = 209.3 lb./ac.
2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 54(21) on page 357.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1951—1955. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1533 lb./ac. (ii) (a) 662.2 lb./ac. (b) 346.2 lb./ac. (iii) Main effect of G is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>G_1</th>
<th>G_2</th>
<th>G_3</th>
<th>G_4</th>
<th>G_5</th>
<th>G_6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_0</td>
<td>1766</td>
<td>1033</td>
<td>1300</td>
<td>1400</td>
<td>1333</td>
<td>1000</td>
<td>1380</td>
</tr>
<tr>
<td>P_1</td>
<td>1800</td>
<td>933</td>
<td>1217</td>
<td>917</td>
<td>1333</td>
<td>1367</td>
<td>1344</td>
</tr>
<tr>
<td>P_2</td>
<td>1800</td>
<td>983</td>
<td>1850</td>
<td>1333</td>
<td>933</td>
<td>1372</td>
<td></td>
</tr>
<tr>
<td>P_3</td>
<td>2150</td>
<td>1133</td>
<td>1450</td>
<td>1000</td>
<td>1333</td>
<td>950</td>
<td>1336</td>
</tr>
<tr>
<td>Mean</td>
<td>1879</td>
<td>1033</td>
<td>1554</td>
<td>1163</td>
<td>1308</td>
<td>1062</td>
<td>1333</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. P marginal means = 220.7 lb./ac.
2. G marginal means = 140.5 lb./ac.
3. G means at the same level of P = 2.2 lb./ac.
4. P means at the same level of G = 339.6 lb./ac.

---

Crop: Maize (Kharif).
Ref: I.A.R.I. 57(19).
Type ‘M’.

Object: To study the effect of Hubam clover grown with F for seed, fodder and G.M. on the succeeding Maize crop.

1. BASAL CONDITIONS:
(i) (a) Hubam clover—Maize. (b) Hubam clover. (c) As per treatments. (ii) (a) and (b) N.A. (ii') 3.8.1957. (iv) (a) 4 ploughings with desi plough and 2 tractor discings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 5 weedings, 2 horse hoeings and 1 thinning. (ix) N.A. (x) 18 to 20.11.1957.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 54(21) on page 357.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1954—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 3276 lb./ac. (ii) (a) 802.0 lb./ac. (b) 562.0 lb./ac. (iii) G effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>G_1</th>
<th>G_2</th>
<th>G_3</th>
<th>G_4</th>
<th>G_5</th>
<th>G_6</th>
<th>Mean</th>
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<tbody>
<tr>
<td>P_0</td>
<td>3022</td>
<td>2566</td>
<td>3568</td>
<td>2791</td>
<td>2435</td>
<td>2552</td>
<td>3189</td>
</tr>
<tr>
<td>P_1</td>
<td>2864</td>
<td>2839</td>
<td>3787</td>
<td>2648</td>
<td>2197</td>
<td>2860</td>
<td>2899</td>
</tr>
<tr>
<td>P_2</td>
<td>4012</td>
<td>3306</td>
<td>4294</td>
<td>3143</td>
<td>2904</td>
<td>2691</td>
<td>3392</td>
</tr>
<tr>
<td>P_3</td>
<td>3779</td>
<td>3192</td>
<td>4548</td>
<td>3210</td>
<td>3172</td>
<td>3085</td>
<td>3554</td>
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<tr>
<td>Mean</td>
<td>3619</td>
<td>3076</td>
<td>4349</td>
<td>3048</td>
<td>2727</td>
<td>2797</td>
<td>3236</td>
</tr>
</tbody>
</table>
Crop :- Maize (Kharif).


Ref :- I.A.R.I. 54(22).

Object :- To study whether fertility can be maintained or improved through organic and inorganic manures in Maize-Wheat-Pea rotation.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat—Pea. (b) Wheat—Pea. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 21 and 22.7.1954.
   (iv) (a) and (b) N.A. (c) 21 and 22.7.1954.
   (v) (a) and (b) N.A. (c) Nil. (vi) N.A. (vii) Irrigated. (viii) Yes. (ix) Yes.

2. TREATMENTS:
   5 manurial treatments : T0 = Control, T1 = 60 lb. of N as A/S + 100 lb. of P2O5 as Super. T2 = T1 + 100 lb. of K2O as Pot. Sul.
   T3 = 60 lb. of N as F.Y.M. + 100 lb. of P2O5 as Super + 100 lb. of K2O as Pot. Sul.
   T4 = 60 lb. of N as castor cake + 100 lb. of P2O5 as Super + 100 lb. of K2O as Pot. Sul.

3. DESIGN:
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) 38’x25’. (b) 24’x25’. (c) 6’x2’. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Yield of grain. (iv) (a) 1952—1959. (b) Yes. (c) Nil. (v) to (xi) N.A.

5. RESULTS:
   (i) 1804 lb./ac. (ii) 263.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment
   T0  T1  T2  T3  T4
   Av. yield 1474 2122 2028 1494 1902
   S.E./mean = 107.5 lb./ac.

--------------------------

Crop :- Maize (Kharif).


Ref :- I.A.R.I. 55(12).

Object :- To study whether fertility can be maintained or improved through organic and inorganic manures in Maize-Wheat-Pea rotation.

BASAL CONDITIONS:
(i) (a) Maize—Wheat—Pea. (b) Wheat—Pea. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 5.7.1955.
(iv) (a) and (b) N.A. (c) Nil. (vi) Pusa Yellow no. 2. (vii) Irrigated. (viii) Yes. (ix) N.A. (a) 11 and 12.10.1955.

2. TREATMENTS:
   Same as in expt. no. 54(22) above.
3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 33' x 23'. (b) 33' x 29'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 690 lb./a. (ii) 172.5 lb./a.. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./a.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>461</td>
<td>712</td>
<td>713</td>
<td>796</td>
<td>767</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>70.4 lb./a.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop:** Maize (Kharif).  **Ref:** I.A.R.I. 56(17).

**Site:** Indian Agri. Res. Instit., New Delhi.  **Type:** 'M'.

Object:—To study whether fertility can be maintained or improved through organic and inorganic manures in Maize—Wheat—Pea rotation.

1. BASAL CONDITIONS:
(i) (a) Maize—Wheat—Pea. (b) Pea. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 13 and 14.7.1956.
(iv) (a) 1 Victory plough and 2 disc ploughings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 hoeings with horse hoe, 1 weeding and 1 thinning.

2. TREATMENTS:
Same as in expt. no. 54(22) on page 359.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 33' x 23'. (b) 35' x 29'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Good. Lodging due to rains. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 575 lb./a. (ii) 213.5 lb./a. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./a.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>519</td>
<td>644</td>
<td>473</td>
<td>532</td>
<td>679</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>95.3 lb./a.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop:** Maize (Kharif).  **Ref:** I.A.R.I. 57(20).

**Site:** Indian Agri. Res. Instit., New Delhi.  **Type:** 'M'.

Object:—To study whether fertility can be maintained or improved through organic and inorganic manures in Maize—Wheat—Pea rotation.

1. BASAL CONDITIONS:
(i) (a) Maize—Wheat—Pea. (b) Pea. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 2.8.1957. (iv) (a) 1 Victory ploughing, 1 discing and 1 grubbing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weeding and 1 hoeing. (ix) N.A. (x) 10.11.1957.
2. TREATMENTS:
Same as in expt. no. 54(22) on page 359.
Organic manures applied in full in kharif and inorganic half in rabi and half in kharif.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38' x 29'. (b) 36' x 27'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1473 lb./ac. (ii) 224.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1291</td>
<td>1379</td>
<td>1542</td>
<td>1646</td>
<td>1509</td>
</tr>
</tbody>
</table>

* S.E./mean = 91.6 lb./ac.

Crop: Maize (Kharif).


Ref: I.A.R.I. 58(24).

Type: ‘M’.

Object: To study whether fertility can be maintained or improved through organic and inorganic manures in Maize—Wheat—Pea rotation.

1. BASAL CONDITIONS:
(i) (a) Maize—Wheat—Pos. (b) N.A. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 18.7.1958. (iv) (a) 1 ploughing with Victory plough. (b) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 2 hoeings, 2 weeding, 2 tractor discings and 2 grubblings. (ix) N.A. (x) 27 to 30.10.1958.

2. TREATMENTS:
Same as in expt. no. 54(22) on page 359.
Organic manures applied in full in kharif and inorganic half in kharif and half in rabi.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38' x 29'. (b) 36' x 27'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of stem borer. (iii) Yield of grain. (iv) (a) 1951—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 497 lb./ac. (ii) 157.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>468</td>
<td>503</td>
<td>460</td>
<td>562</td>
<td>491</td>
</tr>
</tbody>
</table>

* S.E./mean = 64.1 lb./ac.

Crop: Maize (Kharif).


Ref: I.A.R.I. 59(11).

Type: ‘M’.

Object: To study whether fertility can be maintained or improved through organic and inorganic manures in Maize—Wheat—Pea rotation.
1. BASAL CONDITIONS:

(i) (a) Maize-Wheat-Pea. (b) N.A. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 16.7.1956. (iv) (a) 1 Victory ploughing, 1 bullock discing and 3 tractor discings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) N.A. (x) 13 to 17.10.1959.

2. TREATMENTS:

Same as in exp. no. 54(22) on page 359.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 32' X 23'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 979 lb./ac. (ii) 268.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>707</td>
<td>1148</td>
<td>1053</td>
<td>979</td>
<td>1007</td>
</tr>
<tr>
<td>S.E./mean = 109.8 lb./ac.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Crop: Maize (Kharif).

Object:—To study whether fertility can be maintained or improved through organic and inorganic manures in Maize—Wheat rotation.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 1 ploughing with Victory plough and preparation of land with desi plough. (b) to (a) N.A. (vi) Pusa yellow no. 2. (vii) Irrigated. (viii) 2 weedings, 1 horse hoeing, 2 thinning and 1 earthing up. (ix) N.A. (x) 9 to 15.10.1955.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(23) on page 362.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1952—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1082 lb./ac. (ii) 237.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>782</td>
<td>1009</td>
<td>1075</td>
<td>1280</td>
</tr>
</tbody>
</table>
| S.E./mean | 97.0 lb./ac.

Crop: Maize (Kharif).

Object:—To study whether fertility can be maintained or improved through organic and inorganic manures in Maize—Wheat rotation.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 13 and 14.7.1956. (iv) (a) 2 desi ploughings and 1 Victory ploughing. (b) to (a) N.A. (v) Nil. (vi) Pusa yellow no. 2. (vii) Irrigated. (viii) 2 weedings, 2 hoeings, 2 thinning. (ix) N.A. (x) 23 and 25.10.1956.

2. TREATMENTS:
   Same as in exp. no. 54(23) on page 362.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 36'x29'. (b) 36'x27'. (v) 1'x1'. (vi) Yes.

4. GENERAL:
   (i) Good. Lodging due to rains. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1008 lb./ac. (ii) 213.9 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>725</td>
<td>1032</td>
<td>1005</td>
<td>1123</td>
</tr>
</tbody>
</table>
| S.E./mean | 87.3 lb./ac.
Object: To study whether fertility can be maintained or improved through organic and inorganic manures in Maize—Wheat rotation.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 2.8.1957. (iv) (a) 1 Victory ploughing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 2 weedings, 1 hoeing and 1 tractor discing. (ix) N.A. (x) 8.11.1957.

2. TREATMENTS:
   \[ T_0 = \text{Control} \ (\text{no manure}), \ T_1 = 60 \text{ lb./ac. of } N \text{ as } \text{A/S} + 100 \text{ lb./ac. of } \text{P}_2\text{O}_5 \text{ as } \text{Super, } T_2 = T_3 + 100 \text{ lb./ac. of } \text{K}_2\text{O as Pot. Sul.}, \ T_4 = 60 \text{ lb./ac. of } N \text{ as FYM} + 100 \text{ lb./ac. of } \text{P}_2\text{O}_5 \text{ as Super and } 100 \text{ lb./ac. of } \text{K}_2\text{O as Pot. Sul.} \]
   Organic manures applied in full in kharif and inorganic half in kharif and half in rabi.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1326 lb./ac. (ii) 200.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>( T_4 )</th>
<th>S.E./mean (lb./ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1173</td>
<td>1402</td>
<td>1340</td>
<td>1329</td>
<td></td>
<td>81.9</td>
</tr>
</tbody>
</table>

Object: To study whether fertility can be maintained or improved through organic and inorganic manures in Maize—Wheat rotation.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 18.7.1958. (iv) (a) 1 Victory ploughing, 2 tractor discings and 1 grubbing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 2 hoeings and 2 weedings. (ix) N.A. (x) 27 to 30.10.1958.

2. TREATMENTS:
   Same as in exp. no. 54(23) on page 362. Organic manures applied in full in kharif and inorganic manures half in kharif and half in rabi.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'×29'. (b) 36'×27'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Attack of stem borer. (iii) Yield of grain. (iv) (a) 1952—1959. (b) Yes. (c) Nil. (vi) to (vii) Nil.

5. RESULTS:
   (i) 566 lb./ac. (ii) 195.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>( T_4 )</th>
<th>S.E./mean (lb./ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>551</td>
<td>598</td>
<td>497</td>
<td>520</td>
<td>666</td>
<td>80.0</td>
</tr>
</tbody>
</table>
Crop: Maize (Kharif).

Object: To study whether fertility can be maintained or improved through organic and inorganic manures in Maize-Wheat rotation.

1. BASAL CONDITIONS:
(i) (a) Wheat-Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 16.7.1959. (iv) (a) 1 Victory ploughing, 1 bullock discing and 3 tractor discings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 1 thinning, 2 weedings and 1 hoeing. (ix) N.A. (x) 13 to 17.10.1959.

2. TREATMENTS:
Same as in exp. no. 54(23) on page 362.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 32'X23'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1957—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1352 lb/ac. (ii) 228.1 lb/ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1045</td>
<td>1382</td>
<td>1481</td>
<td>1344</td>
<td>1578</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>93.1 lb/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Maize (Kharif).

Object: To compare the effects of Dicalcium Phos. and Super on Wheat-Maize rotation.

1. BASAL CONDITIONS:
(i) (a) Wheat—Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 26.7.1956. (iv) (a) 1 Victory ploughings and 2 desi ploughings. (b) to (e) N.A. (v) Nil. (vi) Yellow no. 2. (vii) Unirrigated. (viii) 2 weedings and 1 hand weeding. (ix) N.A. (x) 29 and 30.10.1956.

2. TREATMENTS:
4 manurial treatments: T0=Control, T1=40 lb/ac. of N as A/SfN, T2=T1+60 lb/ac. of P2O5 as Super and T3=T1+60 lb/ac. of P2O5 as Dicalcium Phos.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 42'X27'. (b) 41'X26'. (v) 6'X6'. (vi) Yes.

4. GENERAL:
(i) Good. Lodged due to rains. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—1956. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 558 lb/ac. (ii) 149.2 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>489</td>
<td>590</td>
<td>590</td>
<td>564</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>60.9 lb/ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Maize (Kharif).

Object: To study whether the fertility can be maintained or improved through organic and inorganic manures in Maize—Wheat rotation.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 5.8.1957. (iv) (a) 1 tractor ploughing and 2 tractor discings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 1 hoeing. (ix) N.A. (x) 13.11.1957.

2. TREATMENTS:
   4 manurial treatments: $T_0$ = Control, $T_1 = 40$ lb./ac. of N as $NH_4NO_3$, $T_2 = T_1 + 80$ lb./ac. of $P_2O_5$ as Super and $T_3 = T_2 + 80$ lb./ac. of $P_2O_5$ as Dicalcium Phos.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6 (iv) (a) 24'×30'. (b) 22'×28'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1131 lb./ac. (ii) 350.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>978</td>
<td>1156</td>
<td>1082</td>
<td>1309</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>143.0 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Maize (Kharif).

Object: To study whether the fertility can be maintained or improved through organic and inorganic manures in Maize—Wheat rotation.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 14.8.1958. (iv) (a) 1 tractor grubbing and 2 deshi ploughings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 3 weedings and 1 hoeing. (ix) N.A. (x) 19.11.1958.

2. TREATMENTS:
   Same as in exp. no. 57(22) above.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 24'×30'. (b) 22'×28'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 533 lb./ac. (ii) 63.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>336</td>
<td>549</td>
<td>649</td>
<td>599</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>25.0 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop : Maize (Kharif).  
Type : 'M'.

Object : To study whether the fertility can be maintained or improved through organic and inorganic manures in Maize-Wheat rotation.

1. BASAL CONDITIONS :
   (i) (a) Wheat-Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 24.7.1959. (iv) (a) 1 victory ploughing, 3 desi ploughings and 2 discings with bullock. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 2 weedings. (ix) N.A. (x) 27.10.1959.

2. TREATMENTS :
   Same as in expt. no. 57(22) on page 366.

3. DESIGN :
   (i) R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) 24' X 30'. (b) 18' X 24'. (v) 3' X 3'. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
   (i) 1149 lb./ac. (ii) 273.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment  
   Treatment  
   Treatment  
   Treatment  
   Treatment  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_a</th>
<th>T_b</th>
<th>T_c</th>
<th>T_d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>768</td>
<td>1462</td>
<td>1299</td>
<td>1068</td>
</tr>
</tbody>
</table>

   S.E./mean = 111.5 lb./ac.

Crop : Maize (Kharif).  
Type : 'M'.

Object : To study the influence of compost on humus formation and crop yield.

1. BASAL CONDITIONS :
   (i) (a) Maize-Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 21.7.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings and 1 hoeing. (ix) N.A. (x) 23.10.1954.

2. TREATMENTS :
   All combinations of (1) and (2)+3 extra treatments
   (1) 3 types of compost : T_a = Plastered trench, T_b = Overground heap and T_c = Exposed pit.
   (2) 3 levels of N as compost : N_1 = 40, N_2 = 80 and N_3 = 120 lb./ac.

   E_1 = No manure, E_2 = A/S at 20 lb./ac. of N to maize+20 lb./ac. of N to succeeding wheat and E_3 = A/S at 40 lb./ac. of N to maize+40 lb./ac. of N to succeeding wheat.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 24.5' X 30'. (b) 20.5' X 26'. (v) 2' X 2'. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—1954. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
   (i) 1362 lb./ac. (ii) 281.6 lb./ac. (iii) Main effects of N and E are highly significant. (iv) Av. yield of grain in lb./ac.
Crop: Maize (Kharif).


Object: To study the effect of different levels of N and organic and inorganic fertilizers on Maize.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 7.7.1957. (iv) (a) 2 ploughings, 1 discing and 1 beaming. (b) to (e) N.A. (v) N.A. (vi) Yellow No. 2. (vii) Irrigated. (viii) 2 hoeings and 1 weeding: (ix) N.A. (x) 13.10.1957.

2. TREATMENTS:

   **Main-plot treatments:**
   7 manurial treatments: M₀=Control, M₁=Sodium silicate at 0.15% silicate on dry soil basis, M₂=Sodium silicate at 0.3% silicate on dry soil basis, M₃=F.Y.M. at 5 tons/ac., M₄=F.Y.M. at 10 tons/ac., M₅=Castor cake at 30 lb./ac. of N and M₆=Castor cake at 60 lb./ac. of N.

   **Sub-plot treatments:**
   3 levels of N as A/S: N₀=0, N₁=30 and N₂=60.

3. DESIGN:
   (i) Split-plot. (ii) (a) 7 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 21'×17.3'. (b) 21'×10'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Maize borer. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2140 lb./ac. (ii) 311.1 lb./ac. (b) 360.9 lb./ac. (iii) Main effects of M and N are highly significant. (iv) Av. yield of grain in lb./ac.

\[
\begin{array}{c|ccc|c|c|c|c|c|c|c}
 & M₀ & M₁ & M₂ & M₃ & M₄ & M₅ & M₆ & Mean \\ 
N₀ & 1473 & 1495 & 1803 & 1841 & 1527 & 1577 & 2006 & 1675 \\ 
N₁ & 2239 & 2161 & 1631 & 2220 & 2723 & 2145 & 2464 & 2240 \\ 
N₂ & 2529 & 2066 & 1694 & 3154 & 2792 & 2624 & 2675 & 2505 \\ 
Mean & 2080 & 1907 & 1709 & 2438 & 2347 & 2115 & 2382 & 2140 \\
\end{array}
\]

S.E. of M or N marginal mean = 146.6 lb./ac.
S.E. of body of table or E mean = 111.4 lb./ac.
S.E. of N means at the same level of M = 294.6 lb./ac.
S.E. of M means at the same level of N = 281.8 lb./ac.
Crop :- Maize (Kharif).

Ref :- I.A.R.I. 59(22).


Type :- 'M'.

Object:—To test the effect of organic manures and fertilizers on the yield of crops in the rotation of Wheat —Maize—Wheat.

1. BASAL CONDITIONS :
(i) (a) Wheat—Maize—Wheat. (b) Wheat. (c) As per treatment. (ii) to (x) N.A.

2. TREATMENTS :

Main-plot treatments:
4 organic manures; M₀=No manure, M₁=Guar (G.M.), M₂=60 lb./ac. of N as rich cake and M₃=60 lb./ac. of N as F.Y.M.

Sub-plot treatments:
5 inorganic manures: F₃=No fertilizer, F₁=40 lb./ac. of N as A/S, F₂=80 lb./ac. of P₂O₅ as Super, F₃=F₁+F₂ and F₄=F₁+F₂+60 lb./ac. of K₂O as Pot. Sul.

Sub-sub-plot treatments:
2 levels of N as A/S: N₀=0 and N₁=30 lb./ac.

Sub-plot treatments were applied to previous crop.

3. DESIGN :
(i) Split-plot. (ii) 4 main-plots/replication ; 5 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) 5¹×12. (b) 49¹×10. (v) 7×1'. (vi) Yes.

4. GENERAL :
(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—coedl. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
(i) 1874 lb./ac. (ii) (a) 604.5 lb./ac. (b) 584.6 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>F₃</th>
<th>F₄</th>
<th>Mean</th>
<th>N₀</th>
<th>N₁</th>
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</thead>
<tbody>
<tr>
<td>M₀</td>
<td>1778</td>
<td>1841</td>
<td>1823</td>
<td>1796</td>
<td>1905</td>
<td>1829</td>
<td>1758</td>
<td>1900</td>
</tr>
<tr>
<td>M₁</td>
<td>1825</td>
<td>2021</td>
<td>1880</td>
<td>1965</td>
<td>1905</td>
<td>1919</td>
<td>1864</td>
<td>1974</td>
</tr>
<tr>
<td>M₂</td>
<td>1911</td>
<td>1986</td>
<td>1503</td>
<td>1700</td>
<td>1824</td>
<td>1785</td>
<td>1703</td>
<td>1807</td>
</tr>
<tr>
<td>M₃</td>
<td>1791</td>
<td>2077</td>
<td>2006</td>
<td>1694</td>
<td>2248</td>
<td>1963</td>
<td>1824</td>
<td>2102</td>
</tr>
<tr>
<td>Mean</td>
<td>1826</td>
<td>1981</td>
<td>1803</td>
<td>1789</td>
<td>1970</td>
<td>1874</td>
<td>1787</td>
<td>1961</td>
</tr>
<tr>
<td>N₀</td>
<td>1804</td>
<td>1852</td>
<td>1697</td>
<td>1737</td>
<td>1843</td>
<td>1849</td>
<td>2101</td>
<td>1840</td>
</tr>
<tr>
<td>N₁</td>
<td>1849</td>
<td>2111</td>
<td>1909</td>
<td>1840</td>
<td>2098</td>
<td>1804</td>
<td>2111</td>
<td>1909</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means = 110.3 lb./ac. 6. N means at the same level of M = 139.5 lb./ac.
2. F marginal means = 119.6 lb./ac. 7. M means at the same level of N = 147.9 lb./ac.
3. N marginal means = 69.7 lb./ac. 8. N means at the same level of F = 156.0 lb./ac.
4. F means at the same level of M = 239.6 lb./ac. 9. F means at the same level of N = 162.7 lb./ac.
5. M means at the same level of F = 240.2 lb./ac.

Crop :- Maize (Kharif).

Ref :- I.A.R.I. 56(20).

Site :- Bot. Sub-Stn., Pusa.

Type :- 'M'.

Object:—To study the effect of N, P and K fertilizers on Maize.

1. BASAL CONDITIONS :
(i) and (ii) N.A. (iii) 13.6.1956. (iv) (a) 3 ploughings, 2 beamings and 2 harrowings. (b) to (e) N.A. (v) N.A. (vi) Yellow 2. (vii) N.A. (viii) 1 weeding and 3 hoeings. (ix) N.A. (x) 30.9.1956 to 7.10.1956.
2. TREATMENTS:
10 manurial treatments: T₀ = Control (no manure), T₁ = 80 lb./ac. of FYM, T₂ = 40 lb./ac. of N as Rape cake, T₃ = 40 lb./ac. of N as A/S T₄ = 50 lb./ac. of K₂O as Pot. Sulf., T₅ = 80 lb./ac. of P₂O₅ as Super, T₆ = T₁ + T₂, T₇ = T₃ + T₄, T₈ = T₅ + T₆ and T₉ = T₃ + T₄.

3. DESIGN:

4. GENERAL:
Continuous rain, cloudy weather and wind damaged the crop to the extent of 50%.

5. RESULTS:
(i) 992 lb./ac. (ii) 359.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀</td>
<td>618</td>
</tr>
<tr>
<td>T₁</td>
<td>1526</td>
</tr>
<tr>
<td>T₂</td>
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</tr>
<tr>
<td>T₃</td>
<td>1065</td>
</tr>
<tr>
<td>T₄</td>
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</tr>
<tr>
<td>T₈</td>
<td>1202</td>
</tr>
<tr>
<td>T₉</td>
<td>1002</td>
</tr>
</tbody>
</table>

S.E./mean = 113.8 lb./ac.

Crop: Maize (Kharif).
Site: Bot. Sub-Stn., Pusa.
Object: To study the effects of N, P and K fertilizers on Maize.

Ref: I.A.R.I. 57(24).
Type: 'M'.

1. BASAL CONDITIONS:
(i) Very poor. (ii) Nil. (iii) N.A.
(iv) 1 ploughing with Empire plough and 5 desi ploughings. (b) to (e) N.A. (f) N.A. (g) N.A. (h) N.A. (i) 26.9.1957.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 56(20) on page 369.

4. GENERAL:
(i) Very poor. (ii) Nil. (iii) Grain yield. (iv) 1930—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 737 lb./ac. (ii) 238.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀</td>
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</tr>
<tr>
<td>T₁</td>
<td>1334</td>
</tr>
<tr>
<td>T₂</td>
<td>1065</td>
</tr>
<tr>
<td>T₃</td>
<td>794</td>
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<tr>
<td>T₄</td>
<td>413</td>
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<tr>
<td>T₅</td>
<td>668</td>
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<tr>
<td>T₆</td>
<td>435</td>
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<tr>
<td>T₇</td>
<td>907</td>
</tr>
<tr>
<td>T₈</td>
<td>807</td>
</tr>
<tr>
<td>T₉</td>
<td>566</td>
</tr>
</tbody>
</table>

S.E./mean = 75.3 lb./ac.

Crop: Maize (Kharif).
Site: Bot. Sub-Stn., Pusa.
Object: To study the effects of N, P and K fertilizers on Maize.

Ref: I.A.R.I. 58(27).
Type: 'M'.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 26.6.1958. (iv) 5 ploughings, 1 beamng and harrowing. (b) to (e) N.A. (f) to (vii) N.A. (viii) 2 weedings, 2 hoeings with horse hoe and 1 earthing up. (ix) N.A. (x) 8.10.1958.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 56(20) on page 369.
4. GENERAL:
   (i) Good. (ii) Stem borer in young stage. (iii) Grain yield. (iv) (a) 1930—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Due to continuous heavy rain followed by strong wind the crop suffered heavily. (vii) Nil.

5. RESULTS:
   (i) 560 lb./ac. (ii) 249.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ | T₆ | T₇ | T₈ | T₉
   Av. yield  | 413| 955| 884| 512| 455| 474| 319| 545| 594| 413
   S.E./mean  = 79.0 lb./ac.

Crop := Maize (Kharif).
Object := To study the effect of N, P and K fertilizers on Maize.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 15.6.1959. (iv) (a) 1 ploughing with Empire plough, 2 dest ploughings and harrowing with spring hoe. (b) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 2 earthings, 1 harrowing and 1 thinning. (ix) N.A. (x) 25.9.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 56(20) on page 369.

4. GENERAL:
   (i) Good. (ii) The crop in its early stage was attacked by stem borer. (iii) Grain yield. (iv) (a) 1930—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Scarcity of rains affected the crop very much. (viii) Nil.

5. RESULTS:
   (i) 989 lb./ac. (ii) 301.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ | T₆ | T₇ | T₈ | T₉
   Av. yield  | 668| 1197| 1716| 984| 652| 764| 551| 952| 1192| 874
   S.E./mean  = 95.4 lb./ac.

Crop := Maize (Kharif).
Object := To study the effect of phosphobacterin inoculation of Maize seed and its effect on P₂O₅ availability.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 9.8.1957. (iv) (a) Tractor discing twice. (b) to (e) N.A. (v) to (vii) N.A. (viii) 1 bullock hoe, 1 thinning, spreading and hoeing twice. (ix) N.A. (x) 13 to 15.11.1957.

2. TREATMENTS:
   All combinations of (1) and (2) + 2 extra treatments
   (1) 5 sources of P₂O₅ at 60 lb./ac.; S₀ = Control (No P₂O₅), S₁ = B.M., S₂ = Rock Phos., S₃ = Super and S₄ = F.Y.M.
   (2) 2 applications of Fosfo. 24: F₀ = No Fosfo. 24 and F₁ = Fosfo. 24.
   Extra treatments: E₁ = Indian culture and E₂ = Phosphobacterin.
3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 31' x 29'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 1760 lb./ac. (ii) 298.3 lb./ac. (iii) Main effect of V is significant. (iv) Ave. yield of grain in lb./ac.
   F₁ = 1665 lb./ac. and F₂ = 1929 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
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</thead>
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<td>F₀</td>
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<td>1544</td>
<td>1536</td>
<td>1600</td>
<td>1804</td>
<td>1625</td>
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<tr>
<td>F₁</td>
<td>1851</td>
<td>2019</td>
<td>1977</td>
<td>1674</td>
<td>1394</td>
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<tr>
<td>Mean</td>
<td>1746</td>
<td>1777</td>
<td>1756</td>
<td>1637</td>
<td>1844</td>
<td>1752</td>
</tr>
</tbody>
</table>

S.E. of F marginal mean = 54.5 lb./ac.
S.E. of S marginal mean = 86.1 lb./ac.
S.E. of body of table or E mean = 121.8 lb./ac.

Crop = Maize (Kharif).

Ref: I.A.R.I. 59(15).
Object: To study the effect of different levels and different stages of application of N on different varieties of Maize.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 12 to 14.7.1959. (iv) (a) 1 ploughing, 1 grubbing and levelling. (b) to (e) N.A. (v) to (vii) N.A. (viii) 1 weeding, 2 hoeings and 1 earthing up. (ix) N.A. (x) 15.10.1959.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 2 varieties: V₁ = K.T.-41 and V₂ = A.E.S.-805.
   (2) 2 levels of N: N₁ = 60 and N₂ = 180 lb./ac.
   (3) 3 times of application: T₁ = At seeding, T₂ = Half at seeding + half after 30 days and T₃ = At seeding + 1 after 30 days + 1 prior to peak flowering.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 29' x 15'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Attack of powdery mildew. Spraying of fungicide. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1377 lb./ac. (ii) 226.0 lb./ac. (iii) Main effect of V is highly significant and effect of T is significant.
   (iv) Ave. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
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</tr>
<tr>
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<td>1404</td>
<td>1527</td>
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<td></td>
</tr>
<tr>
<td>N₂</td>
<td>1317</td>
<td>1398</td>
<td>1406</td>
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<td></td>
</tr>
</tbody>
</table>
Crop: Maize (Kharif).
Type: 'MV'.

Object: To study the effect of different doses of N and P on different varieties of Maize.

1. BASAL CONDITIONS:
   (i) and (ii) N.A.  (iii) 18.4.51.  (iv) 1 ploughing with Victory plough and 1 ploughing with desi plough.
   (b) to (e) N.A.  (v) Nil.  (vi) As per treatments.  (vii) Irrigated.  (viii) Hoeing.  (ix) N.A.  (x) 6 to 8.7.1954.

2. TREATMENTS:
   All combinations of (1), (2) and (3):
   (1) 2 varieties: V₁ = Pusa N.P.-13 and V₂ = Kanpur-251.
   (2) 3 levels of N as AS: N₀=0, N₁=20 and N₂=40 lb./ac.
   (3) 3 levels of P₂O₅ as Super: P₀=0, P₁=30 and P₂=60 lb./ac.

3. DESIGN:
   (i) 3x3x2 confd.  (ii) 6.  (b) N.A.  (iii) 4.  (iv) As per treatments.  (v) Yes.

4. GENERAL:
   (i) N.A.  (ii) Nil.  (iii) Yield of grain.  (iv) As per treatments.  (v) Yes.  (vi) Nil.

5. RESULTS:
   (i) 622 lb./ac.  (ii) 101.9 lb./ac.  (iii) None of the effects is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>P₀</th>
<th>P₁</th>
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<td>596</td>
<td>668</td>
<td>622</td>
<td>582</td>
<td>625</td>
<td>652</td>
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<tr>
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<td>661</td>
<td>622</td>
<td>559</td>
<td>621</td>
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<td>609</td>
<td>642</td>
<td>689</td>
<td></td>
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</tr>
</tbody>
</table>

S.E. of N or P marginal mean = 20.8 lb./ac.
S.E. of V marginal mean = 17.0 lb./ac.
S.E. of body of V or N or V X P marginal mean = 29.4 lb./ac.
S.E. of body of N X P table = 36.0 lb./ac.

Crop: Maize (Kharif).
Type: 'CV'.

Object: To study the effect of piercing the plant stalks before or during reproductive stage on different varieties of Maize.
1. BASAL CONDITIONS:
   (i) and (ii) N.A.  (iii) 21.7.1959.  (iv) (a) Ploughing and levelling.  (b) to (e) N.A.  (vi) 60 lb/ac. of N.
   (vii) 30.10.1959.
2. TREATMENTS:
   All combinations of (i) and (ii)
   (1) 2 varieties of Maize: V1 = K.T.-41 and V2 = A.E.S. - 805.
   (2) 2 levels of piercing the stalk: P0 = No piercing and P1 = Piercing during tasseling.
3. DESIGN:
   (i) Fact. in R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 3.  (iv) (a) and (b) 15' x 66',  (v) Nil.  (vi) Yes.
4. GENERAL:
   (i) Good.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1959 - N.A.  (b) N.A.  (c) N.A.  (d) Nil.  (v) and (vi) Nil.  (vii) Raw-
   data as well as two-way tables for average yield: N.A.
5. RESULTS:
   (i) 1599 lb/ac.  (ii) 143.7 lb/ac.  (iii) P effect alone is highly significant.  (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>V1</th>
<th>V2</th>
<th>P0</th>
<th>P1</th>
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<tr>
<td>Av. yield</td>
<td>1560</td>
<td>1638</td>
<td>1374</td>
<td>1822</td>
</tr>
</tbody>
</table>

S.E. of V or P marginal mean = 58.7 lb/ac.

Crop :- Maize (Kharif).


Ref :- I.A.R.I. 54(25).

Type :- 'CM'.

Object :- To study the effect of N and depth of cultivation on the yield of Maize.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Heavy soil.  (b) N.A.  (iii) to (x) N.A.
2. TREATMENTS:
   Main-plot treatments:
   4 methods of ploughing: M1= Tractor ploughing 10" deep followed by tractor grubber, M2= Bullock
   soil inverting plough 5" to 6" deep followed by country plough, M3= 4" to
   5" deep by country plough and M4= 3" to 4" deep by tractor disc.

Sub-plot treatments:
4 levels of N as F.Y.M.: N0=0, N1=40, N2=80 and N3=120 lb/ac.
3. DESIGN:
   (i) Split-plat.  (ii) (a) 4 main-plots/block; 4 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 40' x 27',  (b)
   38' x 25',  (v) 1 x 1',  (vi) Yes.
4. GENERAL:
   (i) and (ii) N.A.  (iii) Yield of grain.  (iv) (a) 1950-1954.  (b) Yes.  (c) NIl.  (v) to (vii) Nil.
5. RESULT:
   (i) 1101 lb/ac.  (ii) (a) 198.7 lb/ac.  (b) 249.9 lb/ac.  (iii) None of the effects is significant.  (iv) Av. yield
   of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
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<td>1181</td>
<td>1209</td>
<td>1307</td>
<td>1171</td>
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<tr>
<td>M2</td>
<td>1046</td>
<td>1072</td>
<td>1227</td>
<td>1198</td>
<td>1136</td>
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<td>M4</td>
<td>949</td>
<td>1232</td>
<td>1037</td>
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<tr>
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<td>992</td>
<td>1338</td>
<td>1106</td>
<td>1169</td>
<td>1131</td>
</tr>
</tbody>
</table>
Crop: Maize.

Object: To study the effect of pre and post emergence application of 2, 4-D and A/N alone and in combination with hoeings in controlling weeds in Maize crop.

Ref: L.A.R.I. 56(21).
Type: ‘CM’.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Berseem. (c) N.A. (ii) (a) Medium loam. (b) N.A. (iii) 17.7.1956. (iv) (a) to (d) N.A. 
   (v) 60 lb/ac. of P₂O₅ as Super and 30 lb/ac. of K₂O as Pok Sol. The fertilizers were applied in side bands at 
   the time of planting. (vi) N.A. (vii) Irrigated. (viii) As per treatments. (ix) 16.69". (x) 25.10.1956.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 3 levels of hoeing : H₀ = 0, H₁ = 1 and H₂ = 2 hoeings.
   (2) 3 levels of 2, 4-D : D₀ = 0, D₁ = 8 ozs./ac. and D₂ = 16 ozs./ac.
   (3) 3 levels of N as A/N : N₀ = 0, N₁ = 40 and N₂ = 80 lb/ac.
   Sub-plot treatments:
   2 stages of application of fertilizers : T₁ = Pre-emergence and T₂ = Post-emergence.

3. DESIGN:
   (i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block and 2 sub-plots/main-plot. (b) N.A. 
   (iii) 2. (iv) (a) 28.5' X 15.5'. (b) 24.5' X 10.0'. (v) 1.0' X 1.75'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Powdery mildew affected the crop. Bordeaux mixture was sprayed as a control measure. 
   (iii) Height of the crop, number of cobs per plant, number of grains per cob, test weight and yield of grain 
   and straw. (iv) (a) 1956–contd. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Two way tables : N.A.

5. RESULTS:
   (i) 2740 lb./ac. (ii) (a) 508.5 lb./ac. (b) 404.8 lb./ac. (iii) None of the effects is significant. (iv) Av. 
   yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>H₀</th>
<th>H₁</th>
<th>H₂</th>
<th>D₀</th>
<th>D₁</th>
<th>D₂</th>
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<th>N₁</th>
<th>N₂</th>
<th>T₁</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
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<td>2608</td>
<td>2822</td>
<td>2600</td>
<td>2839</td>
<td>2781</td>
<td>2411</td>
<td>2905</td>
<td>2905</td>
<td>2715</td>
<td>2765</td>
</tr>
</tbody>
</table>

S.E. of T marginal mean = 84.7 lb./ac. 
S.E. of T marginal mean = 55.0 lb./ac.

Crop : Maize (Chard).
Object : To study the effect of pre and post-emergence application of 2, 4-D and A/N alone and in 
combination with hoeings in controlling weeds in Maize crop.

Ref : I.A.R.I. 57(25), Type : ‘CM’. 

1. BASAL CONDITIONS:
   (i) to (vii) N.A. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 3 levels of hoeing : H₀ = 0, H₁ = 1 and H₂ = 2 hoeings with cultivator.
   (2) 3 levels of 2, 4-D : D₀ = 0, D₁ = 8 ozs./ac. and D₂ = 16 ozs./ac.
   (3) 3 levels of N as A/N : N₀ = 0, N₁ = 40 and N₂ = 80 lb/ac.
   Sub-plot treatments:
   2 times of application : T₁ = Pre-emergence and T₂ = Post-emergence.

3. DESIGN:
   (i) Split-plot confd. (ii) (a) 3 blocks/replication ; 9 main-plots/block and 2 sub-plots/main-plot. (l) N.A. 
   (iii) 2. (iv) (a) 28.5' X 15.5'. (b) 24.5' X 10.0'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1978 lb./ac. (ii) (a) 455.6 lb./ac. (b) 237.8 lb./ac. (iii) Main effects of N and H are highly significant. 
   (iv) Av. yield of grain in lb./ac.
Crop :- Maize (Kharif).


Type :- 'CM'.

Object :- To study the effect of Hubam clover as a mixed crop in Wheat and its green manuring effect on Maize in Wheat—Maize rotation.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 30.7.1957. (iv) (a) 1 discing by bullock and 2 double discings with tractor. (b) N.A. (c) 10 srs./ac. (d) and (e) N.A. (vi) N.A. (vi) Yellow no. 2. (vii) Unirrigated. (viii) 1 weeding and 1 hoeing with a hand hoe. (ix) N.A. (x) 2.11.1957.

2. TREATMENTS:
   12 crop rotations with manuring: T1 = Fallow—Wheat, T2 = Wheat with 40 lb./ac. of N—Maize, T3 = Wheat—Maize with 40 lb./ac. of N, T4 = Wheat with 40 lb./ac. of N and Hubam clover for fodder—Maize, T5 = Wheat with 40 lb./ac. of N to maize, T6 = Wheat with 80 lb./ac. of P2O5 to Hubam clover, T7 = Wheat—Hubam clover for G.M.—Maize, T8 = Wheat—Hubam clover for G.M.—Maize and T9 = Sainhemp for G.M.—Wheat.

   N applied as A/S and P2O5 as Super.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12 (effective treatments 10 for maize crop), (b) N.A. (iii) 3. (iv) (a) 65' x 131'. (b) 65' x 111'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2179 lb./ac. (ii) 374.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment: T1  T2  T3  T4  T5  T6  T7  T8  T9  T10 T11 T12
   Av. yield: 1578 2119 2362 1827 2222 1754 2296 2662 2244 2724

   S.E./mean = 187.3 lb./ac.

---

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>N6</th>
<th>N7</th>
<th>N8</th>
<th>T1</th>
<th>T2</th>
<th>Mean</th>
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<tbody>
<tr>
<td>H1</td>
<td>1444</td>
<td>1842</td>
<td>1925</td>
<td>1430</td>
<td>1791</td>
<td>1990</td>
<td>1746</td>
<td>1727</td>
<td>1737</td>
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<tr>
<td>H2</td>
<td>2062</td>
<td>2184</td>
<td>2068</td>
<td>1873</td>
<td>2211</td>
<td>2524</td>
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<td>2055</td>
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<td>1856</td>
<td>2041</td>
<td>2036</td>
<td>1707</td>
<td>2107</td>
<td>2119</td>
<td>1977</td>
<td>1978</td>
<td>1978</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. H, D or N marginal means = 107.3 lb./ac.
2. T marginal means = 51.5 lb./ac.
3. T means at the same level of H, D or N = 89.3 lb./ac.
4. H, D or N means at the same level of T = 124.6 lb./ac.
5. S.E. of body of HxD or HxN or DxN table = 131.5 lb./ac.
Crop :- Maize (Kharif).

Object :- To study the effect of Hubam clover as a mixed crop in Wheat and its green manuring effect on Maize in Wheat-Maize rotation.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 7.7.1958. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) N.A. (x) 14.10.1958.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 57(25) on page 377.

4. GENERAL:
   (i) Good. (ii) Stem borers attack. (iii) Yield of grain. (iv) (a) 1955—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) The crop was damaged by continuous rains. (vii) Nil.

5. RESULTS:
   (i) 399 lb./ac. (ii) 85.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
<th>T12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>381</td>
<td>316</td>
<td>403</td>
<td>424</td>
<td>306</td>
<td>415</td>
<td>425</td>
<td>370</td>
<td>444</td>
<td>504</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>42.7 lb./ac</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

Crop :- Maize (Kharif).

Object :- To study the effect of Hubam clover as a mixed crop in Wheat and its green manuring effect on Maize in Wheat-Maize rotation.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 14.7.1959. (iv) (a) 1 bullock discing, 3 tractor discings and 1 levelling. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 taming, 2 weedings and 1 hoeing. (ix) N.A. (x) 19.10.1959.

2. TREATMENTS:
   Same as in exp. no. 57(26) on page 377.

3. DESIGN:
   (i) R.B.D. (ii) (a) 11 (effective treatments 10 for maize crop). (b) N.A. (iii) 4. (iv) (a) 63' x 11.5'. (b) 59' x 8'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1955—contd. (b) Yes. (c) Nil. (v) to (vi) Nil.

5. RESULTS:
   (i) 1606 lb./ac. (ii) 360.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>T10</th>
<th>T11</th>
<th>T12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1455</td>
<td>1813</td>
<td>1533</td>
<td>1543</td>
<td>1766</td>
<td>1550</td>
<td>1766</td>
<td>1655</td>
<td>1492</td>
<td>1688</td>
<td></td>
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</tr>
<tr>
<td>S.E./mean</td>
<td>180.0 lb./ac</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
Crop : Maize (Kharif).

Object : To study the residual effect of different levels of P and number of cuttings of vicia satina on the succeeding Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Vicia satina—Maize. (b) Vicia satina. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 21.7.1954.
   (iv) (a) 3 desi ploughings. (b) to (e) N.A. (v) Nil. (vi) Yellow No 2. (vii) Irrigated. (viii) 1 hoeing with horse hoe, 2 thinnings and 2 weedings. (ix) N.A. (x) 29 and 30.10.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of P₂O₅ to vicia satina : P₀ = 0, P₁ = 40, P₂ = 80 and P₃ = 120 lb./ac.
   (2) 2 levels of cuttings of vicia satina : C₁ = 1 and C₂ = 2.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Attack of stem borer. (iii) Yield of grain. (iv) (a) 1953—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1429 lb./ac. (ii) 345.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>Mean</th>
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<tr>
<td>C₁</td>
<td>1</td>
<td>50</td>
<td>1528</td>
<td>1430</td>
<td>1190</td>
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<tr>
<td>C₂</td>
<td>1376</td>
<td>1476</td>
<td>1652</td>
<td>1452</td>
<td>1214</td>
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<tr>
<td>Mean</td>
<td>1538</td>
<td>1502</td>
<td>1531</td>
<td>1321</td>
<td>1429</td>
</tr>
</tbody>
</table>

S.E. of P marginal mean = 122.1 lb./ac.
S.E. of C marginal mean = 86.4 lb./ac.
S.E. of body of table = 172.7 lb./ac.

Crop : Maize (Kharif).

Object : To study the effect of different spacings keeping a definite population with different levels of N on different varieties of Maize.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 17.7.1959. (iv) (a) 1 ploughing with tractor, 2 disking with tractor and levelling. (b) to (e) N.A. (vi) 80 lb./ac. of P₂O₅ + 80 lb./ac. of K₂O. (vii) to (ix) N.A. (x) 21.10.1959.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (2) 3 spacings between rows : S₁ = 24", S₂ = 30" and S₃ = 36".
   (3) 3 levels of N as A/S : N₁ = 40, N₂ = 80 and N₃ = 120 lb./ac.

3. DESIGN:
   (i) 3² confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (v) to (vi) N.A. (v) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—N.A. (b) N.A. (c) Nil. (v) to (vi) Nil.
5. RESULTS:

(i) 1947 lb./ac.  (ii) 40.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>Mean</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
</tr>
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<td>1900</td>
<td>1834</td>
<td>1964</td>
<td>1899</td>
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<td>1960</td>
<td>1960</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>1946</td>
<td>2045</td>
<td>1980</td>
<td>1900</td>
<td>2194</td>
<td>1975</td>
<td>1903</td>
</tr>
<tr>
<td>( S_3 )</td>
<td>2010</td>
<td>1876</td>
<td>1971</td>
<td>1952</td>
<td>2037</td>
<td>1948</td>
<td>1873</td>
</tr>
<tr>
<td>Mean</td>
<td>1952</td>
<td>1918</td>
<td>1972</td>
<td>1947</td>
<td>2036</td>
<td>1961</td>
<td>1945</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>2009</td>
<td>2001</td>
<td>2098</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( N_2 )</td>
<td>2004</td>
<td>1916</td>
<td>1962</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( N_3 )</td>
<td>1842</td>
<td>1838</td>
<td>1855</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 66.8 lb./ac.
S.E. of body of any table = 115.6 lb./ac.

Crop :- Oats (Rabi).

Site :- Bot. Sub-Sta., Pusa.

Object :—To study the effect of N, P and K on Oats.

1. BASAL CONDITIONS:

(i) and (ii) N.A.  (iii) 14 and 15.1.1956. (iv) (a) 2 deep ploughings, harrowing and harrowing. (b) to (e) N.A. (v) Nil.  (vi) M.P. — I.  (vii) N.A. (viii) 1 weeding. (ix) N.A.  (x) 1 and 2.4.1957.

2. TREATMENTS:

10 manurial treatments: \( M_0 \) = Control (no manure). \( M_1 \) = 8000 lb./ac. of FYM, \( M_2 \) = 40 lb./ac. of N as Rape cake, \( M_3 \) = 40 lb./ac. of N as AJS, \( M_4 \) = 50 lb./ac. of \( \text{P}_{2}\text{O}_5 \) as Super, \( M_4 = M_3 + M_5 \), \( M_5 = M_3 + M_4 \), \( M_6 = M_4 + M_5 \) and \( M_7 = M_6 + M_7 \).

3. DESIGN:

(i) R.B.D. (ii) (a) 10. (b) N.A.  (iii) 10. (iv) (a) N.A.  (b) 42' \times 21'. (v) N.A.  (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1930 — contd. (b) Yes.  (c) N.A.  (v) to (vii) N.A.

5. RESULTS:

(i) 1209 lb./ac. (ii) 252.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>( M_4 )</th>
<th>( M_5 )</th>
<th>( M_6 )</th>
<th>( M_7 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>877</td>
<td>1739</td>
<td>1018</td>
<td>1387</td>
<td>787</td>
<td>1042</td>
<td>882</td>
<td>1565</td>
</tr>
</tbody>
</table>

S.E./mean = 79.8 lb./ac.

Crop :- Bajra (Kharif).


Ref :- I.A.R.I. 57(28).

Object :—To study the effect of different cultivation practices on the yield of Bajra.

Type :- "C'.

Ref :- I.A.R.I. 56(22).
BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 28.7.1957. (iv) (a) As per treatments. (b) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) and (ix) N.A. (x) 21.10.1957 to 5.11.1957.

2. TREATMENTS:
All combinations of (1) and (2).
(1) 3 methods of preparatory cultivation; C<sub>1</sub>= Tractor ploughing at 9° to 10° depth followed by grubbing and disking, C<sub>2</sub>= Bullock soil inverting ploughing at 5° to 6° depth followed by country plough and C<sub>3</sub>= Surface cultivation by harrow.
(2) 3 post sowing cultural operations: I<sub>0</sub>= Control, I<sub>1</sub>= Interculture with bullock hoe and I<sub>2</sub>= Weeding with kharpi.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 75'X14'. (b) 73'X12'. (v) 1'X1'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 670 lb./ac. (ii) 87.3 lb./ac. (iii) Main effect of I is highly significant and that of C is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C&lt;sub&gt;1&lt;/sub&gt;</th>
<th>C&lt;sub&gt;2&lt;/sub&gt;</th>
<th>C&lt;sub&gt;3&lt;/sub&gt;</th>
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<tr>
<td>I&lt;sub&gt;0&lt;/sub&gt;</td>
<td>668</td>
<td>606</td>
<td>611</td>
<td>628</td>
</tr>
<tr>
<td>I&lt;sub&gt;1&lt;/sub&gt;</td>
<td>738</td>
<td>621</td>
<td>567</td>
<td>642</td>
</tr>
<tr>
<td>I&lt;sub&gt;2&lt;/sub&gt;</td>
<td>792</td>
<td>698</td>
<td>731</td>
<td>740</td>
</tr>
</tbody>
</table>

Mean: 733 642 636 670
S.E. of any marginal mean = 25.2 lb./ac.
S.E. of body of table = 43.7 lb./ac.

Crop: Bajra (Kharif).
Object: To find out the effect of different cultivation practices on Bajra.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 23.7.1958. (iv) (a) As per treatments. (b) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) As per treatments. (ix) N.A. (x) 19.10.1958 to 16.11.1958.

2. TREATMENTS to 4. GENERAL:
Same as in exp't no. 57(28) on page 380.

5. RESULTS:
(i) 308 lb./ac. (ii) 131.2 lb./ac. (iii) Main effect of I alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>I&lt;sub&gt;0&lt;/sub&gt;</th>
<th>I&lt;sub&gt;1&lt;/sub&gt;</th>
<th>I&lt;sub&gt;2&lt;/sub&gt;</th>
<th>Mean</th>
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<tr>
<td>C&lt;sub&gt;1&lt;/sub&gt;</td>
<td>243</td>
<td>453</td>
<td>482</td>
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<tr>
<td>C&lt;sub&gt;3&lt;/sub&gt;</td>
<td>190</td>
<td>208</td>
<td>364</td>
<td>254</td>
</tr>
</tbody>
</table>

Mean: 215 325 383 368

Type: 'C'.
Crop: Bajra (Kharif).
Type: 'CM'.

Object:—To study the effect of different levels of F.Y.M., A/S and different crop rotations on Bajra.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) N.A. (iii) 28 and 29.7.1954. (iv) (a) 4 to 6 ploughings. (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) 11 to 26.10.1954.

2. TREATMENTS:
   Main-plot treatments:
   3 crop rotations: R₁ = Bajra—Wheat, R₂ = Fallow—Wheat and R₃ = Bajra—Fallow.
   Sub-plot treatments:
   5 levels of F.Y.M.: F₀ = 0, F₁ = 2.5, F₂ = 5, F₃ = 10 and F₄ = 20 tons/ac.
   Sub-sub-plot treatments:
   3 levels of N as A/S: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 5 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) . (iv) (a) and (b) 58'×12'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Locusts damaged the crop. (iii) Yield of grain. (iv) (a) 1952—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 104 lb./ac. (ii) (a) 126.2 lb./ac. (b) 114.2 lb./ac. (c) 66.1 lb./ac. (iii) Main effect of R is significant. Main effects of F and N are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>F₃</th>
<th>F₄</th>
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<th>N₁</th>
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<td>1023</td>
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<tr>
<td>R₂</td>
<td>1072</td>
<td>1049</td>
<td>1065</td>
<td>1167</td>
<td>1273</td>
<td>1016</td>
<td>1107</td>
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<tr>
<td>Mean</td>
<td>960</td>
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<td>1008</td>
<td>1059</td>
<td>1199</td>
<td>1041</td>
<td>955</td>
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<td>937</td>
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<tr>
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<td>1041</td>
<td>955</td>
<td>1119</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. R marginal means = 26.6 lb./ac. 6. N means at the same level of R = 24.1 lb./ac.
2. F marginal means = 38.1 lb./ac. 7. R means at the same level of N = 24.5 lb./ac.
3. N marginal means = 17.1 lb./ac. 8. N means at the same level of F = 38.1 lb./ac.
4. F means at the same level of R = 53.8 lb./ac. 9. F means at the same level of N = 49.2 lb./ac.
5. R means at the same level of F = 55.0 lb./ac.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 5.7.1955. (iv) (a) to (e) N.A. (v) Nil. (vi) and (vii) N.A. (viii) Weeding. (ix) N.A. (x) 7.10.1955.

2. TREATMENTS:
All combinations of (i), (2) and (3)
(1) 3 levels of N as A/S: N1 = 20, N2 = 40 and N3 = 60 lb./ac.
(2) 3 times of application of N: T1 = Full dose at sowing, T2 = at tillering stage and T3 = at earing stage.
(3) 3 spacings between rows: S1 = 9', S2 = 12' and S3 = 15'.

3. DESIGN:
(i) 3 conf. (ii) Nil. (iii) 2. (iv) (a) 62.2'X14'. (b) 60'X12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1953—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1035 lb./ac. (ii) 146.8 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>Mean</th>
<th>S1</th>
<th>S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>939</td>
<td>893</td>
<td>823</td>
<td>885</td>
<td>850</td>
</tr>
<tr>
<td>N2</td>
<td>1066</td>
<td>1127</td>
<td>970</td>
<td>1054</td>
<td>1023</td>
</tr>
<tr>
<td>N3</td>
<td>1050</td>
<td>1228</td>
<td>1096</td>
<td>1135</td>
<td>1154</td>
</tr>
<tr>
<td>Mean</td>
<td>1028</td>
<td>1083</td>
<td>963</td>
<td>1025</td>
<td>1036</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 34.6 lb./ac.
S.E. of body of any table = 59.9 lb./ac.

Crop :- Bajra (Kharif).
Ref :- L.A.R.I. 57(29).
Type :- 'D'.
Object :- To study the effectiveness of 2, 4-D in combinations with local method of weeding on growth and yield of Bajra crop.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 28.7.1957. (iv) to (vi) N.A. (vii) Unirrigated. (viii) As per treatments. (ix) N.A. (x) 4.11.1957.

2. TREATMENTS:
10 weedicidal treatments: T0 = No weeding (control), T1 = Weeding only, T2 = Local method of weeding, T3 = Pre-emergence application of 2, 4-D at 1 lb./ac, T4 = Post-emergence application of 2, 4-D at 1 lb./ac, T5 = Post-emergence application of 2, 4-D at 2 lb./ac, T6 = Combination of pre and post-emergence spraying, T7 = Pre-emergence spraying+cultural method of weeding, T8 = Post-emergence spraying+cultural method of weeding and T9 = Pre-emergence+post emergence spraying+cultural method of weeding.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) and (b) 33'X22'. (v) Nil. (vi) Yes.
4. GENERAL:
(i) Poor. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 406 lb./ac. (ii) 131.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>411</td>
<td>527</td>
<td>444</td>
<td>379</td>
<td>469</td>
<td>461</td>
<td>428</td>
<td>444</td>
<td>453</td>
<td>444</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 28.7 lb./ac.

---

Crop: Bajra (Kharif).

Object: To study the effectiveness of 2, 4-D in combination with local method of weeding on growth and yield of Bajra.

1. BASAL CONDITIONS:
(i) to (vii) N.A. (viii) Unirrigated. (xii) As per treatments. (xiii) and (xiv) N.A.

2. TREATMENTS:
Same as in expt. no. 57(29) on page 383.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (i) 4. (iv) (a) 33' x 14'. (b) 31' x 11'. (v) 1' x 9'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) 1957—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(ii) 446 lb./ac. (ii) 57.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>411</td>
<td>527</td>
<td>444</td>
<td>379</td>
<td>469</td>
<td>461</td>
<td>428</td>
<td>444</td>
<td>453</td>
<td>444</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 28.7 lb./ac.

---

Crop: Bajra (Kharif).

Object: To study the effect of some herbicides and cultural treatments for the eradication of baru plants in Bajra yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Baru. (c) N.A. (ii) (a) and (b) N.A. (iii) N.A. (iv) (a) As per treatments. (b) to (e) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 types of ploughings: C₁=Country plough, C₂=Victory plough and C₃=Digging with spades.
(2) 3 seasons of ploughings: T₁=Summer, T₂=Rainy season and T₃=After rainy season.
(3) 3 herbicidal treatments: H₀=Control, H₁=TCA at 40 lb./ac. and H₂=CMV at 20 lb./ac.

3. DESIGN:
(i) 3² confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) I. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A.  (iii) Yield of grain and stalk.  (iv) (a) 1954—N.A.  (b) N.A.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
(i) 3425 lb./ac.  (ii) 508.0 lb./ac.  (iii) Only T effect is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>Mean</th>
<th>H1</th>
<th>H2</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>2693</td>
<td>3760</td>
<td>2800</td>
<td>3084</td>
<td>2693</td>
<td>3280</td>
</tr>
<tr>
<td>C2</td>
<td>3760</td>
<td>3800</td>
<td>3493</td>
<td>3644</td>
<td>4053</td>
<td>3653</td>
</tr>
<tr>
<td>C3</td>
<td>2960</td>
<td>4427</td>
<td>3253</td>
<td>3547</td>
<td>3307</td>
<td>4107</td>
</tr>
<tr>
<td>Mean</td>
<td>3138</td>
<td>3956</td>
<td>3182</td>
<td>3425</td>
<td>3351</td>
<td>3680</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 293.3 lb./ac.
S.E. of body of any table = 169.3 lb./ac.

Crop:- Peas (Rabi).
Ref:- I.A.R.I. 55(15).
Type:- 'M'.

Object:- To test the effect of intensive and heavy manuring on soil fertility as judged from the yield of Peas.

1. BASAL CONDITIONS:
(i) (a) Maize—Pea.  (b) Maize.  (c) As per treatments.  (ii) (a) and (b) N.A.  (iii) 4.11.1955.  (iv) (a) 3 ploughings and discing with tractor.  (b) to (e) N.A.  (v) Nil.  (vi) N.P.—29.  (vii) Irrigated.  (viii) 3 weedings and 3 hoeings with hand hoe.  (ix) N.A.  (x) 30.3.1956.

2. TREATMENTS:
5 manurial treatments:  M1=Control,  M2=60 lb./ac. of N as A/S+100 lb./ac. of P2O5 as super,  M3=M2+100 lb./ac. of K2O as Pot. Sui.,  M4=60 lb./ac. of F.Y.M.+100 lb./ac. of P2O5 as Super+100 lb./ac. of K2O as Pot. Sui. and  M5=60 lb./ac. of N as Castor cake+100 lb./ac. of P2O5 as Super+100 lb./ac. of K2O as Pot. Sui.
Fertilizers applied on 4.11.1955.

3. DESIGN:
(i) R.B.D.  (ii) (a) 5.  (b) N.A.  (iii) 6.  (iv) (a) 38°×25°.  (b) 36°×27°.  (v) 1°×1°.  (vi) Yes.

4. GENERAL:
(i) Good.  (ii) Nil.  (iii) Yield of Peas.  (iv) (a) 1952—contd.  (b) Yes.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
(i) 2614 lb./ac.  (ii) 232.2 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of peas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2201</td>
<td>2558</td>
<td>2636</td>
<td>2918</td>
<td>2756</td>
</tr>
</tbody>
</table>

S.E./mean = 94.8 lb./ac.
Crop: Peas (Rabi).

Object: To test the effect of intensive and heavy manuring on soil fertility as judged from the yield of Peas.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 19.11.1957. (iv) 2 tractor discings and 2 grubbings. (v) Irrigated. (vi) 1.4.1958.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 55(15) on page 385.

Organic manures applied in full in kharif and artificial manures were applied half in kharif and half in rabi.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of peas. (iv) 1952—contd. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 1452 lb./ac. (ii) 45.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of peas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>M_4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1024</td>
<td>1710</td>
<td>1540</td>
<td>1726</td>
<td>1461</td>
</tr>
</tbody>
</table>

S.E./mean = 18.6 lb./ac.

---

Crop: Peas (Rabi).

Object: To test the effect on soil fertility of organic manures and inorganic fertilizers as judged from the yield of Peas.

1. BASAL CONDITIONS:

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 55(15) on page 385.

Organic manures applied full in kharif and fertilizers half in kharif and half in rabi.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of peas. (iv) 1955—contd. (b) No. (c) Nit. (v) to (vii) N.A.

5. RESULTS:
(i) 1731 lb./ac. (ii) 191.6 lb./ac. (iii) Treatment differences are highly significant. (v) Av. yield of peas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>M_4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1259</td>
<td>1795</td>
<td>2046</td>
<td>1809</td>
<td>1757</td>
</tr>
</tbody>
</table>

S.E./mean = 78.2 lb./ac.

---

Crop: Peas (Rabi).

Object: To study the comparative efficiency of soil and spray applications of P and micro-nutrients on Peas.
1. **BASAL CONDITIONS:**
   (i) to (iv) N.A. (v) Nil. (vi) to (x) N.A.

2. **TREATMENTS:**
   12 manurial treatments: 
   - T₀ = Control, T₁ = 40 lb./ac. of P₂O₅ as Super as soil application, T₂ = 1 lb./ac. of Mo as soil application, T₃ = 5 lb./ac. of Cu as soil application, T₄ = 5 lb./ac. of Mn as soil application, T₅ = 5 lb./ac. of P₂O₅ as triple Super 0.3% solution as spray, T₆ = 1 lb./ac. of Mo as spray, T₇ = 1 lb./ac. of Cu as spray and T₈ = 1 lb./ac. of Mn as spray.
   - 40 lb./ac. of P₂O₅ as Super was applied in T₂ to T₅ as soil application and 40 lb./ac. of P₂O₅ as triple Super 0.3% solution in spray was applied in T₇ to T₁₁.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 10. (iv) (a) 36' × 18'. (b) 34' × 12'. (v) 1' × 3'. (vi) Yes.

4. **GENERAL:**
   (i) Good. (ii) N.A. (iii) Yield of peas. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**
   (i) 1968 lb./ac. (ii) 203.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of peas in lb./ac.
   - Treatment | Av. yield | S.E./mean
   - T₀ | 483 | 101.9 lb./ac.
   - T₁ | 1909 | 1909
   - T₂ | 1905 | 1905
   - T₃ | 1894 | 1894
   - T₄ | 2051 | 2051
   - T₅ | 2058 | 2058
   - T₆ | 2068 | 2068
   - T₇ | 1694 | 1694
   - T₈ | 2024 | 2024
   - T₉ | 1680 | 1680
   - T₁₀ | 2175 | 2175
   - T₁₁ | 401

---

**Crop:** Peas (Rabi)
**Site:** Bot. Sub-Stn., Pusa

Object: To study the effect of N, P and K on Peas.

1. **BASAL CONDITIONS:**
   (i) and (ii) N.A. (iii) 19 and 20.10.1957. (iv) (a) 2 ploughings 1 harrowing and 4 beamings. (b) to (e) N.A. (v) N.A. (vi) N.P.-29. (vii) Unirrigated. (viii) 1 weeding and 1 horing. (ix) N.A. (x) 5/2.1958, 20.2.1958 and 4.3.1958.

2. **TREATMENTS:**
   10 manurial treatments: T₀ = Control, T₁ = 8000 lb./ac. of F.Y.M., T₂ = 40 lb./ac. of N as rape seed cake, T₃ = 40 lb./ac. of N as A/S, T₄ = 50 lb./ac. of K₂O as Pot. Sul., T₅ = 50 lb./ac. of P₂O₅ as Super, T₆ = 40 lb./ac. of N as A/S+50 lb./ac. of K₂O as Pot. Sul+40 lb./ac. of P₂O₅ as Super, T₇ = 40 lb./ac. of N as A/S+50 lb./ac. of K₂O as Pot. Sul.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 10. (iv) (a) N.A. (b) 42' × 22'. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Good. (ii) N.A. (iii) Yield of peas. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**
   (i) 199 lb./ac. (ii) 502 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   - Treatment | Av. yield | S.E./mean
   - T₀ | 483 | 62.9 lb./ac.
   - T₁ | 948 | 62.9 lb./ac.
   - T₂ | 639 | 62.9 lb./ac.
   - T₃ | 427 | 62.9 lb./ac.
   - T₄ | 450 | 62.9 lb./ac.
   - T₅ | 566 | 62.9 lb./ac.
   - T₆ | 387 | 62.9 lb./ac.
   - T₇ | 394 | 62.9 lb./ac.
   - T₈ | 321 | 62.9 lb./ac.
   - T₉ | 401 | 62.9 lb./ac.

---

**Crop:** Peas (Rabi)
**Site:** Bot. Sub-Stn., Pusa

Object: To study the effect of N, P and K on Peas.
Crop: Peas (Rabi).

Object: To study the relative response of different varieties of Peas to different levels of N and P under rainfed conditions.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Lobia. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 9.11.1955. (iv) (a) 2 tractor discings and once tripalli. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 3 hoeings. (ix) 5.59". (x) March-April, 1957.

2. TREATMENTS:
   All combinations of (1), (2) and (3).
   (1) 3 levels of N as A/S: N1 = 0, N2 = 10 and N3 = 20 lb./ac.
   (2) 3 levels of P2O5 as Super: P1 = 0, P2 = 30 and P3 = 60 lb./ac.
   (3) 3 varieties: V1 = N.P.-29, V2 = Early hedger and V3 = Bonaville.

3. DESIGN:
   (i) 3³ partially confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 18’ X 17’. (b) 15’ X 15’. (v) 11’ X 1’. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of peas. (iv) (a) 1956 - 1958. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Raw-data and two-way tables: N.A.

5. RESULTS:
   (i) 2564 lb./ac. (ii) 195.6 lb./ac. (iii) Main effects of N, P and V are highly significant. (iv) Av. yield of peas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2681</td>
<td>2737</td>
<td>2274</td>
<td>2190</td>
<td>2554</td>
<td>2948</td>
<td>2223</td>
<td>1665</td>
<td>2555</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>46.1 lb./ac</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Peas (Rabi).

Object: To study the response of different varieties of Peas under rainfed conditions to N and P.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (iii) (a) and (b) N.A. (iii) 31.10.1958. (iv) (a) 1 ploughing with desi plough. (b) Sowing by kera. (c) 48 lb./ac. (d) and (e) N.A. (v) NIL. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedicings and 2 hoeings. (ix) N.A. (x) 10.3.1959 and 21 to 26.3.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in expnt. no. 56(23) above.

4. GENERAL:
   (i) Satisfactory. (ii) Attack of powdery mildew. (iii) Yield of peas. (iv) (a) 1956 - 1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1808 lb./ac. (ii) 219.9 lb./ac. (iii) V effect is highly significant, while N and P effects are significant. (iv) Av. yield of peas in lb./ac.
Crop :- Peas (Rabi).

Object :- To study the effect of Azatobacterin alone and in combination with manures and fertilizers on Peas.

1. BASAL CONDITIONS:
(ii) to (x) N.A.

2. TREATMENTS:
9 treatments : T₀=Control, T₁=F.Y.M. at 5 tons/ac., T₂=Azatobacterin seed culture, T₃=Azatobacterin+cellulose decomposing organism, T₄=F.Y.M.+Azatobacterin seed culture, T₅=F.Y.M.+Azatobacterin+cellulose decomposing organism, T₆=Super, T₇=Super+Azatobacterin culture and T₈=Super+Azatobacterin culture+cellulose decomposing organism.

Levels of F.Y.M. and Super is N.A.

3. DESIGN:
(ii) R.B.D. (ii) (a) and (b) N.A. (iii) 4. (iv) (a) 27.3'x20.0', (b) 25.3'x18.0'. (v) 1'x1'. (vi) N.A.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of peas. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1497 lb./ac. (ii) 429.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of peas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀</td>
<td>1142</td>
<td>214.8 lb./ac.</td>
</tr>
<tr>
<td>T₁</td>
<td>1280</td>
<td></td>
</tr>
<tr>
<td>T₂</td>
<td>1443</td>
<td></td>
</tr>
<tr>
<td>T₃</td>
<td>1485</td>
<td></td>
</tr>
<tr>
<td>T₄</td>
<td>1083</td>
<td></td>
</tr>
<tr>
<td>T₅</td>
<td>2119</td>
<td></td>
</tr>
<tr>
<td>T₆</td>
<td>1729</td>
<td></td>
</tr>
<tr>
<td>T₇</td>
<td>1322</td>
<td></td>
</tr>
<tr>
<td>T₈</td>
<td>1505</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 51.8 lb./ac.
S.E. of body of any table = 89.8 lb./ac.

Crop :- Peas.

Object :- To study the relative effectiveness of different weedicides applied as pre and post-emergence sprays in controlling weeds in Peas.

1. BASAL CONDITIONS:
(i) to (c) N.A. (ii) (a) Medium loam. (b) N.A. (iii) 9.11.1955. (iv) (a) to (e) N.A. (v) Nil. (vi) N.P. 29. (vii) Irrigated. (viii) N.A. (ix) 3.6", (x) 12.4.1957.

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>P₉</th>
<th>Mean</th>
<th>V₁</th>
<th>V₂</th>
<th>V₉</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
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<td>1743</td>
<td>1823</td>
<td>1774</td>
<td>2175</td>
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<tr>
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<td>1922</td>
<td>1810</td>
<td>1849</td>
<td>1880</td>
<td>2108</td>
<td>862</td>
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<tr>
<td>N₉</td>
<td>1756</td>
<td>1897</td>
<td>1720</td>
<td>1791</td>
<td>2134</td>
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<td>Mean</td>
<td>1811</td>
<td>1817</td>
<td>1797</td>
<td>1808</td>
<td>2139</td>
<td>785</td>
</tr>
</tbody>
</table>

Ref :- I.A.R.I. 56(24).
Type :- 'DC'.

Ref :- I.A.R.I. 59(21).
Type :- 'CM'.
2. TREATMENTS:

All combinations of (1) and (2)+3 extra treatments
(1) 2 stages of application of weedicides: T₁ = Pre-emergence and T₂ = Post-emergence.
(2) 4 different weedicides: W₁ = 2, 4-D, W₂ = 2, 4-D-8, W₃ = M.C.P.A. and W₄ = M.C.P.B.
3 extra treatments: E₀ = Control, E₁ = Cultivation by bullocks and E₂ = Hand weeding.

Weedicides were applied at 12 oz./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 23' × 13'. (b) 28' × 7.5'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Damaged by hailstorm. (ii) Nil. (iii) No. of nodules and wt. of shoots per plant, and yield of peas.
(iv) (a) 1956—1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2335 lb./ac. (ii) 409.9 lb./ac. (iii) Interaction W × T alone is significant. (iv) Av. yield of peas in lb./ac.

\[ E₀ = 2205 \text{ lb./ac.}, E₁ = 2584 \text{ lb./ac. and } E₂ = 2674 \text{ lb./ac.} \]

<table>
<thead>
<tr>
<th></th>
<th>W₁</th>
<th>W₂</th>
<th>W₃</th>
<th>W₄</th>
<th>Mean</th>
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<tbody>
<tr>
<td>T₁</td>
<td>2263</td>
<td>2444</td>
<td>2188</td>
<td>2288</td>
<td>2321</td>
</tr>
<tr>
<td>T₂</td>
<td>2526</td>
<td>1596</td>
<td>2304</td>
<td>2518</td>
<td>2236</td>
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<tr>
<td>Mean</td>
<td>2394</td>
<td>2020</td>
<td>2296</td>
<td>2403</td>
<td>2278</td>
</tr>
</tbody>
</table>

S.E. of T marginal mean = 102.4 lb./ac.
S.E. of W marginal mean = 144.9 lb./ac.
S.E. of body of table or E mean = 204.9 lb./ac.

Crop : Peas (Rabi).
Type : DC.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 26.10.1957 (iv) (a) 1 tractor ploughing, followed by 2 grubings and 2 discings. (b) to (e) N.A. (v) 40 lb./ac. of P₂O₅ and 20 lb./ac. of K₂O. (vi) N.A. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 31.3.1958 and 1.4.1958.

2. TREATMENTS:
Same as in exp. no. 56(24) on page 389.

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 12.5' × 28'. (b) 8'0" × 28'. (v) 2'3" × 2'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of peas. (iv) (a) 1956—1958. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1914 lb./ac. (ii) 272.2 lb./ac. (iii) Main effect of W, interaction W × T and 'E vs. others' are highly significant. (iv) Av. yield of peas in lb./ac.
Crop: Peas (Rabi).  
Ref: I.A.R.I. 58(32).  
Type: ‘DC’.

Object: To study the relative effectiveness of different weedicides when applied at pre and post-emergence stage in controlling the weeds in Peas.

1. BASAL CONDITIONS:
(i) to (vi) Nil. (vii) Irrigated. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS:
Same as in expt. no. 56(24) on page 389.

3. DESIGN:
(i) R.B.D. (ii) a) 11. (b) N.A. (iii) 4. (iv) a) N.A. (b) 24’×7.5’. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Peas yield. (iv) a) 1956–1958. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1598 lb./ac. (ii) 245.8 lb./ac. (iii) Interaction T×W is highly significant. Main effect of W and ‘extra others’ are significant. (iv) Av. yield of Pea in lb./ac.

\[ E_0 = 1555 \text{ lb./ac., } E_1 = 1744 \text{ lb./ac. and } E_2 = 1901 \text{ lb./ac.} \]

\[
\begin{array}{cccc|c}
 \text{T}_1 & W_1 & W_2 & W_3 & W_4 & \text{Mean} \\
1514 & 1679 & 2432 & 1531 & 1539 \\
1621 & 1144 & 1465 & 1591 & 1555 \\
\text{Mean} & 1567 & 1411 & 1448 & 1761 & 1547 \\
\end{array}
\]

S.E. of W marginal mean = 36.4 lb./ac.
S.E. of T marginal mean = 86.9 lb./ac.
S.E. of body of table or E mean = 122.9 lb./ac.

Crop: Peas.  
Ref: I.A.R.I. 56(25).  
Type: ‘DCM’.

Object: To study the effect of weedicide, A/S and cultivation in controlling weeds in Peas.
1. **BASAL CONDITIONS**:
   (i) (a) N.A.  (b) *Mucuna chinensis*.  (c) N.A.  (ii) (a) Medium loam.  (b) N.A.  (iii) 9.11.1956.  (iv) (a) to (vi) N.A.  (v) Nil.  (vi) N.P. 29.  (vii) Irrigated.  (viii) As per treatments.  (ix) 5.5.5'. (x) 15.4.1957.

2. **TREATMENTS**:
   All combinations of (1), (2) and (3)
   (1) 3 levels of weedicide (Tropotox 40% MCPB): M₀=0, M₁=8 and M₂=16 oz/ac.
   (2) 3 levels of N as A/S: N₀=0, N₁=20 and N₂=40 lb/ac.
   (3) 3 cultivation treatments: C₀=No cultivation, C₁=1 and C₂=2 cultivations.
Weedicide used is 2 methyl, 4 chlorophenoxy butyric acid.

3. **DESIGN**:
   (i) 28 partially confd.  (ii) (a) 9 plots/block ; 3 blocks/replication.  (b) N.A.  (iii) 2.  (iv) (a) 28' × 16'.  (b) 24' × 11'.  (v) 2' × 2'.  (vi) Yes.

4. **GENERAL**:
   (i) N.A.  (ii) Nil.  (iii) Yield of peas.  (iv) (a) 1956—contd.  (b) Yes.  (c) Nil.  (v) and (vi) Nil.  (vii) Raw data and M × C and N × C two-way tables: N.A.

5. **RESULTS**:
   (i) 1783 lb/ac.  (ii) 253.8 lb/ac.  (iii) Main effects of M, C and interaction M × N are significant.  (iv) Av. yield of peas in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1481</td>
<td>2049</td>
<td>1975</td>
<td>1835</td>
</tr>
<tr>
<td>N₁</td>
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</tr>
<tr>
<td>Mean</td>
<td>1528</td>
<td>1852</td>
<td>1969</td>
<td>1783</td>
</tr>
</tbody>
</table>

S.E. of N, M or C marginal mean = 59.8 lb/ac.
S.E. of body of table = 103.6 lb/ac.

---

**Crop**: Peas *(Rabi)*.  
**Site**: Indian Agric. Res. Instt., New Delhi.  
**Ref**: I.A.R.I. 57(33).  
**Type**: ‘DCM’.

Object:—To study the effect of weedicide, A/S and cultivation in controlling weeds in Peas.

1. **BASAL CONDITIONS**:
   (i) to (vi) N.A.  (vii) Irrigated.  (viii) As per treatments.  (ix) and (x) N.A.

2. **TREATMENTS** and 3. **DESIGN**:
   Same as in exp. no. 56(25) on page 391.

4. **GENERAL**:
   (i) and (ii) N.A.  (iii) Yield of peas.  (iv) (a) 1956—N.A.  (b) Yes.  (c) Nil.  (v) and (vi) Nil.  (vii) Raw data and two-way tables : N.A.

5. **RESULTS**:
   (i) 2145 lb/ac.  (ii) 127.7 lb/ac.  (iii) Main effects of M, N and C are significant.  (iv) Av. yield of peas in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>C₀</th>
<th>C₁</th>
<th>C₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1382</td>
<td>2345</td>
<td>2707</td>
<td>2197</td>
<td>2115</td>
<td>2123</td>
<td>2049</td>
<td>2135</td>
<td>2230</td>
</tr>
</tbody>
</table>

S.E./m.e.a = 5.5 lb/ac.
Crop: Peas (Rabi).


Object: To study the effect of weedicide, A/Sand cultivation in controlling weeds in Peas.

1. BASAL CONDITIONS:
   (i) to (vi) N.A. (vii) Irrigated. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS and DESIGN:
   Same as in exp. no. 56(25) on page 391.

3. GENERAL:
   (i) Good. (ii) Nil. (iii) Peas yield. (iv) (a) 1956—N.A (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1631 lb./ac. (ii) 315.7 lb./ac. (iii) Main effect of M, N, C and interaction M x N are highly significant. Interaction M x C is significant. (iv) Av. yield of peas in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>C₀</th>
<th>C₁</th>
<th>C₂</th>
</tr>
</thead>
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<td>M₀</td>
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<td>1406</td>
<td>1458</td>
<td>1420</td>
<td>973</td>
<td>1638</td>
</tr>
<tr>
<td>M₁</td>
<td>1869</td>
<td>1923</td>
<td>1108</td>
<td>1634</td>
<td>1611</td>
<td>1672</td>
</tr>
<tr>
<td>M₂</td>
<td>2364</td>
<td>1955</td>
<td>1197</td>
<td>1839</td>
<td>1716</td>
<td>1748</td>
</tr>
<tr>
<td>Mean</td>
<td>1873</td>
<td>1762</td>
<td>1258</td>
<td>1631</td>
<td>1433</td>
<td>1686</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 74.4 lb./ac.
S.E. of body of any table = 128.9 lb./ac.

Crop: Potato (Rabi).


Object: To study the response of Potato to N, P and K fertilizers.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 24.I0.1957. (iv) (a) 2 ploughings, double disting and double grubbing. (b) to (e) N.A. (f) and (g) N.A. (vii) Irrigated. (viii) 1 hoing and 2 earthingg. (ix) N.A. (x) 13 to 15.2.1958.

2. TREATMENTS:
   All combinations of (1), (2) and (3) + control (3 plots)
   (1) 3 levels of N : N₀ - 80, N₁ - 120 and N₂ - 160 lb./ac.
   (2) 3 levels of P₀ : P₀ = 0, P₁ = 40 and P₂ = 80 lb./ac.
   (3) 3 levels of K₀ : K₀ = 0, K₁ = 40 and K₂ = 80 lb./ac.
   One control plot was taken in each block.

3. DESIGN:
   (i) 3² confd. (ii) a) 10 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 40' x 14', (b) 39' x 8', (v) 1' x 3', (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of tuber. (iv) (a) 1957—1958. (b) N.A. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 6.88 tons/ac.  (ii) 0.71 tons/ac.  (iii) Main effect of P is significant and 'control vs other' is highly significant.  (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
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<td>7.16</td>
<td>7.21</td>
<td>6.91</td>
<td>6.56</td>
<td>7.57</td>
<td>6.62</td>
</tr>
<tr>
<td>N₂</td>
<td>7.12</td>
<td>6.91</td>
<td>7.74</td>
<td>7.28</td>
<td>6.93</td>
<td>7.38</td>
<td>7.46</td>
</tr>
<tr>
<td>Mean</td>
<td>6.71</td>
<td>6.85</td>
<td>7.36</td>
<td>6.58</td>
<td>6.79</td>
<td>7.12</td>
<td>7.02</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.17 tons/ac.
S.E. of body of any table or control mean = 0.29 tons/ac.

Crop - Potato (Rabi).
Object - To study the response of Potato to N, P and K fertilizers.

1. BASAL CONDITIONS:
(i) (a) Nil, (b) and (c) N.A.  (ii) (a) and (b) N.A.  (iii) 23.10.1958.  (iv) (a) Crosswise ploughing, crosswise grubbing and crosswise beaming.  (b) to (e) N.A.  (v) Sanehamp as G.M.  (vi) N.A.  (vii) 2 hoeings and 1 earthing.  (ix) N.A.  (x) 26 to 28.2.1959 and 2.3.1959.

2. TREATMENTS:
Same as in exp't no. 57(34) on page 393.

3. DESIGN:
(i) 3² confd.  (ii) 10 plots/block; 3 blocks/replication.  (b) N.A.  (iii) 2.  (iv) (a) 40'x14', (b) 38'x12', (v) 1'x1'.  (vi) Yes.

4. GENERAL:
(i) Normal.  (ii) Nil.  (iii) Yield of tuber.  (iv) (a) 1957-1958.  (b) Yes.  (c) Nil.  (v) (a) and (b) Nil.  (vi) Slight frost attack.  (vii) Nil.

5. RESULTS:
(i) 3.95 tons/ac.  (ii) 0.48 tons/ac.  (iii) Only main effect of K and 'control vs others' are highly significant.  (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4.03</td>
<td>4.05</td>
<td>4.07</td>
<td>3.71</td>
<td>4.01</td>
<td>4.48</td>
</tr>
<tr>
<td>N₁</td>
<td>3.85</td>
<td>4.02</td>
<td>4.39</td>
<td>4.09</td>
<td>3.80</td>
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<td>4.13</td>
<td>3.93</td>
<td>3.67</td>
<td>3.89</td>
<td>4.23</td>
</tr>
<tr>
<td>Mean</td>
<td>3.90</td>
<td>3.99</td>
<td>4.19</td>
<td>4.03</td>
<td>3.73</td>
<td>4.01</td>
<td>4.35</td>
</tr>
</tbody>
</table>

| K₀      | 3.57| 3.68| 3.93 |
| K₁      | 4.03| 4.06| 3.95 |
| K₂      | 4.10| 4.25| 4.69 |
Crop :- Potato.

Object :- To study the effect of different levels and methods of placement of P on the yield of Potato.

1. BASAL CONDITIONS :
   (i) and (ii) N.A.  (iii) 7 and 8.11.1958.  (iv) (a) 1 ploughing by tripha.  (b) to (c) N.A.  (v) 100 lb. (ac. of N at planting + 1 at earthing) and 80 lb. (ac. of K 2 O.  (vi) N.A.  (vii) Irrigated.  (viii) 1 weeding.  (ix) and (x) N.A.

2. TREATMENTS :

   Treatments in one direction :
   4 levels of P 2 O 5 : P 0 = 0, P 1 = 30, P 2 = 60 and P 3 = 90 lb./ac.

   Treatments in orthogonal direction :
   6 methods of placement : M 1 = Broadcast, M 2 = Double band 2" to the sides in level of seed, M 3 = Double band 1" to the side 2" below seed, M 4 = Single band in the level of seed, M 5 = Single band 2" below the seed and M 6 = Broadcasting in open furrows followed by splitting back the ridges.

3. DESIGN :
   (i) Strip-plot.  (ii) 4 plots in one direction and 6 plots in orthogonal direction.  (b) N.A.  (iii) 5.  (iv) (a) and (b) 14' x 15'.  (v) Nil.  (vi) Yes.

4. GENERAL :
   (i) Satisfactory.  (ii) N.A.  (iii) Tubar yield.  (iv) (a) 1958—contd.  (b) N.A.  (c) Nil.  (v) (a) and (b) N.A.  (vi) Frost attack.  (vii) Nil.

5. RESULTS :
   (i) 2.19 tons/ac.  (ii) (a) 0.23 tons/ac. for P.  (b) 0.44 tons/ac. for M.  (c) 0.23 tons/ac. for P x M.  (iii) Main effect of P is highly significant and main effect of M is significant.  (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>M 1</th>
<th>M 2</th>
<th>M 3</th>
<th>M 4</th>
<th>M 5</th>
<th>M 6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1.66</td>
<td>1.61</td>
<td>1.82</td>
<td>1.59</td>
<td>1.58</td>
<td>1.74</td>
<td>1.67</td>
</tr>
<tr>
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<td>1.81</td>
<td>2.16</td>
<td>2.43</td>
<td>2.03</td>
<td>2.14</td>
<td>2.45</td>
<td>2.17</td>
</tr>
<tr>
<td>P 2</td>
<td>2.01</td>
<td>2.13</td>
<td>2.61</td>
<td>2.40</td>
<td>2.56</td>
<td>2.65</td>
<td>2.43</td>
</tr>
<tr>
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<td>2.45</td>
<td>2.87</td>
<td>2.36</td>
<td>2.34</td>
<td>2.69</td>
<td>2.48</td>
</tr>
<tr>
<td>Mean</td>
<td>1.92</td>
<td>2.14</td>
<td>2.43</td>
<td>2.09</td>
<td>2.15</td>
<td>2.38</td>
<td>2.19</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means = 0.08 tons/ac.
2. P marginal means = 0.11 tons/ac.
3. P means at the same level of M = 0.17 tons/ac.
4. M means at the same level of P = 0.15 tons/ac.
I. BASAL CONDITIONS:
(i) to (iv) N.A. (v) 100 lb./ac. of N+80 lb./ac. of K2O. (vi) to (x) N.A.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 58(35) on page 395.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Tuber yield. (iv) 1958—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2.45 tons/ac. (ii) (a) 0.45 tons/ac. for M. (b) 0.30 tons/ac. for P. (c) 0.57 tons/ac. for MxP. (iii) Main effect of P is highly significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>2.06</td>
<td>2.17</td>
<td>2.01</td>
<td>1.87</td>
<td>2.10</td>
<td>1.97</td>
</tr>
<tr>
<td>P1</td>
<td>2.29</td>
<td>2.60</td>
<td>2.73</td>
<td>2.70</td>
<td>2.52</td>
<td>2.52</td>
</tr>
<tr>
<td>P2</td>
<td>2.32</td>
<td>2.74</td>
<td>2.71</td>
<td>2.79</td>
<td>2.94</td>
<td>2.65</td>
</tr>
<tr>
<td>P3</td>
<td>2.74</td>
<td>2.86</td>
<td>2.88</td>
<td>2.69</td>
<td>2.62</td>
<td>2.67</td>
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<tr>
<td>Mean</td>
<td>2.35</td>
<td>2.59</td>
<td>2.59</td>
<td>2.51</td>
<td>2.55</td>
<td>2.45</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>S.E. of difference of two</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. M marginal means       = 0.14 tons/ac.</td>
</tr>
<tr>
<td>2. P marginal means       = 0.08 tons/ac.</td>
</tr>
<tr>
<td>3. P means at the same level of M = 0.34 tons/ac.</td>
</tr>
<tr>
<td>4. M means at the same level of P = 0.34 tons/ac.</td>
</tr>
</tbody>
</table>

Crop :- Potato (Rabi).
Ref :- I.A.R.I. 54(31).
Type :- 'CM'.

Object :- To study the effect of depth of cultivation with different fertilizers mixtures and their method of placement on the yield of Potato.

1. BASAL CONDITIONS:
(ii) Nil. (b) N.A. (c) Nil (ii) (a) and (b) N.A. (iii) 19 and 20.10.1954. (iv) (a) As per treatments. (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 earthing. (ix) N.A. (x) 6 to 22.3.1955.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2).
(1) 3 methods of cultivation : C0=Tractor ploughing 9" to 10" deep followed by tractor disc, C1=Victory plough 5" to 6" deep followed by country plough and C2=Country plough 4" to 5" deep.
(2) 2 methods of application : B1=Placement in 3 bands (plough hole+2 bands on side) and B2=Broadcast.

Sub-plot treatments:
4 manurial treatments : M1=120 lb./ac. of N, M2=80 lb./ac. of N+80 lb./ac. of P2O5+40 lb./ac. of K2O, M3=120 lb./ac. of N+80 lb./ac. of P2O5+40 lb./ac. of K2O and M4=160 lb./ac. of N+80 lb./ac. of P2O5+40 lb./ac. of K2O.
N, P and K were applied in the from of A/S, Super and Pot. Sul, respectively.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 38.5'x12.5'. (b) 38.5'x9'. (c) 21' on either side. (v) Yes.
4. GENERAL:

(i) Normal. (ii) Attack of frost. (iii) Yield of tuber. (iv) (a) 1952-1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th></th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
<th>Mean</th>
<th>$B_1$</th>
<th>$B_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_1$</td>
<td>9.34</td>
<td>9.81</td>
<td>10.67</td>
<td>10.60</td>
<td>10.11</td>
<td>10.34</td>
<td>9.88</td>
</tr>
<tr>
<td>$C_2$</td>
<td>9.66</td>
<td>10.70</td>
<td>10.54</td>
<td>11.67</td>
<td>10.65</td>
<td>11.12</td>
<td>10.18</td>
</tr>
<tr>
<td>Mean</td>
<td>9.49</td>
<td>10.29</td>
<td>10.61</td>
<td>10.84</td>
<td>10.31</td>
<td>10.65</td>
<td>9.98</td>
</tr>
</tbody>
</table>

C means at the same level of $C$. B means at the same level of $B$.

Crop :- Potato (Rabi).


Type :- 'CM'.

Object :- To study the effect of depth of cultivation with different fertilizer mixtures and their method of application on the yield of Potato.

1. BASAL CONDITIONS:

(ii) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 20 and 21.10.1955. (iv) (a) As per treatments. (b) to (e) N.A. (v) G. M. with samp Kemp. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 1 earthing. (ix) N.A. (x) 31.3.1956 to 8.4.1956.

2. TREATMENTS and 3. DESIGN:

Same as in exp. no. 54(31) on page 396.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of tuber. (iv) (a) 1952-1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th></th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
<th>Mean</th>
<th>$B_1$</th>
<th>$B_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C_1$</td>
<td>9.79</td>
<td>10.76</td>
<td>10.26</td>
<td>11.61</td>
<td>10.60</td>
<td>9.05</td>
<td>12.15</td>
</tr>
<tr>
<td>$C_2$</td>
<td>12.02</td>
<td>12.59</td>
<td>13.41</td>
<td>14.50</td>
<td>13.23</td>
<td>12.80</td>
<td>13.66</td>
</tr>
<tr>
<td>$C_3$</td>
<td>10.84</td>
<td>11.55</td>
<td>12.51</td>
<td>11.92</td>
<td>11.70</td>
<td>11.79</td>
<td>11.62</td>
</tr>
<tr>
<td>Mean</td>
<td>10.88</td>
<td>11.77</td>
<td>12.06</td>
<td>12.68</td>
<td>11.84</td>
<td>11.21</td>
<td>12.48</td>
</tr>
</tbody>
</table>

B means at the same level of $B$.
S.E. of difference of two
1. C marginal means = 0.60 tons/ac.  5. C means at the same level of M = 0.85 tons/ac.
2. B marginal means = 0.49 tons/ac.  6. M means at the same level of B = 0.56 tons/ac.
3. M marginal means = 0.40 tons/ac.  7. B means at the same level of M = 0.69 tons/ac.
4. M means at the same level of C = 0.69 tons/ac.  S.E. of body of C X B table = 0.84 tons/ac.

Crop = Potato.
Ref = I.A.R.I. 56(26).
Type = ‘CM’.

Object = To study the effect of depth of cultivation with different fertilizers mixtures and their method of application on the yield of Potato.

1. BASAL CONDITIONS:

(i) (a) N.A.  (b) Sunn hemp.  (c) N.A.  (ii) (a) Sandy loam.  (b) N.A.  (iii) 22 and 23.10.1956.  (iv) (a) Tractor ploughing, discing, grubbing, victory and country ploughing.  (b) to (e) N.A.  (v) G.M. by sunn hemp.  (vi) D.R.R. (median).  (vii) Irrigated.  (viii) Weeding, hoeing and earthing.  (ix) 5.59’. (x) 14.3.1957 to 5.4.1957.

2. TREATMENTS to 4. GENERAL:

Same as in exp. no. 54(31) on page 396.

5. RESULTS:

(i) 10.24 tons/ac.  (ii) (a) 1.53 tons/ac.  (b) 1.22 tons/ac.  (iii) M effect alone is highly significant.  (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>B1</th>
<th>B2</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>10.47</td>
<td>10.03</td>
<td>10.23</td>
<td>10.16</td>
<td>10.33</td>
<td>8.77</td>
<td>9.97</td>
<td>10.79</td>
<td>11.44</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.27 tons/ac.</td>
<td>0.22 tons/ac.</td>
<td>0.23 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop = Potato.
Ref = I.A.R.I. 58(36).
Type = ‘CM’.

Object = To study the effect of MCPA, early and late earthing up and different methods of fertilizer application on weeds and crop.

1. BASAL CONDITIONS:

(i) to (x) N.A.

2. TREATMENTS:

Main-plot treatments:

All combinations of (1) and (2)

(1) 4 applications of MCPA : M1 = Control, M2 = Pre-sowing application at 1 lb./ac., M3 = Pre-emergence application at 8 ozs./ac. and M4 = M1 + M2.

(2) 4 cultural treatments : C1 = Flat sowing with a late earthing up, C2 = Earthing up immediately after planting with no late earthing up, C3 = Planting on ridges with a late earthing up and C4 = Earthing up immediately after planting with a late earthing up.

Sub-plot treatments:

2 methods of application of fertilizer: F1 = Broadcast and F2 = Placement.

Fertilizer : 80 lb./ac. of N+60 lb./ac. of P2O5 + 40 lb./ac. of K2O.

3. DESIGN:

(i) Split-plot.  (ii) (a) 16 main-plots/replication ; 2 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 15’ x 15’.  (b) 15’ x 12’.  (v) 3’ x 3’.  (vi) Yes.
4. **GENERAL:**

(i) Normal. (ii) Nil. (iii) Tuber yield. (iv) (a) 1958—N.A. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) Nil. (vii) Other two-way tables N.A.

5. **RESULTS:**

(ii) 9.35 tons/ac. (iii) (a) 0.79 tons/ac. (b) 0.48 tons/ac. (iii) C effect is highly significant and interaction C X M is significant. (iv) Av. yield of tuber in tons/ac.

\[
F_1 = 9.53 \text{ tons/ac} \quad \text{and} \quad F_2 = 9.18 \text{ tons/ac}
\]

<table>
<thead>
<tr>
<th></th>
<th>M (_1)</th>
<th>M (_2)</th>
<th>M (_3)</th>
<th>M (_4)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(C_1)</td>
<td>8.73</td>
<td>9.70</td>
<td>6.98</td>
<td>8.52</td>
<td>8.48</td>
</tr>
<tr>
<td>(C_2)</td>
<td>10.69</td>
<td>8.95</td>
<td>7.44</td>
<td>8.88</td>
<td>9.00</td>
</tr>
<tr>
<td>(C_3)</td>
<td>9.81</td>
<td>11.08</td>
<td>10.72</td>
<td>10.72</td>
<td>10.58</td>
</tr>
</tbody>
</table>

Mean = 9.69, 9.76, 8.78, 9.18, 9.35

S.E. of M or C marginal mean = 0.14 tons/ac.
S.E. of F marginal mean = 0.06 tons/ac.
S.E. of body of M X C table = 0.28 tons/ac.

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**Crop:** Potato (Rabi).  
**Site:** Indian Agric. Res. Inst., New Delhi.  
**Ref:** L.A.R.I. 58(37).  
**Type:** 'IM'.

Object: —To find out the optimum irrigation interval based on soil moisture tension at different stages of plant development and further to study the inter-relation of soil moisture and fertilizer treatment.

1. **BASAL CONDITIONS:**

(i) and (ii) N.A. (iii) 27 to 29.10.1958. (iv) (a) to (g) N.A. (v) 10 tons/ac. of compost. (vi) N.A. (vii) Irrigated. (viii) 1 weeding, 1 earthing and spraying of copper fungicides. (ix) N.A. (x) 21 to 28.2.1959.

2. **TREATMENTS:**

**Main-plot treatments:**
All combinations of (1), (2) and (3):
(i) 3 levels of N as N\(_2\) : N\(_0\)=50, N\(_1\)=100 and N\(_2\)=150 lb/ac.
(ii) 3 levels of P\(_2\)O\(_5\) as Super : P\(_0\)=0, P\(_1\)=50 and P\(_2\)=100 lb/ac.
(iii) 3 levels of K\(_2\)O as Pot. Sul. : K\(_0\)=0, K\(_1\)=75 and K\(_2\)=150 lb/ac.

**Sub-plot treatments:**
3 levels of soil moisture tension for irrigation (atmosphere): \(I_0=0.25\) to 0.3, \(I_1=0.5\) to 0.6 and \(I_2=0.75\) to 0.9.

3. **DESIGN:**

(i) Split-plots, confd. (ii) (a) 3 blocks/replication, 9 main-plots/block and 3 sub-plots/main-plots. (b) N.A. (iii) 1 (iv) (a) 12' x 40'. (b) 9' x 29'. (v) 11' x 31'. (vi) Restricted randomization of sub-plot treatments.

4. **GENERAL:**

(i) Very good. (ii) Nil. (iii) Yield of tuber. (iv) (a) and (b) No. (e) Nil. (v) (a) and (b) No. (vi) and (vii) No.

5. **RESULTS:**

(i) 9.03 tons/ac. (ii) (a) 1.04 tons/ac. (b) 0.74 tons/ac. (iii) Main effect of I is highly significant and main effect of K and interactions N X I X P and N X K X I are significant. (iv) Av. yield of tuber in tons/ac.
Crop: Potato.
Ref: I.A.R.I. 56(27).
Type: 'IM'.

Object: To study the relationship of delta of irrigation, depth of irrigation and nitrogen levels on Potato.

1. BASAL CONDITIONS:
   (i) (a) Potato—Cotton—Sugarcane—Wheat. (b) Wheat—N.P.—7.18. (c) 20, 40 and 60 lb./ac. of N+20 lb./ac. of P2O5.
   (ii) (a) Coarse sand 0.88%, fine sand 67.09%, silt 14.12% and clay 13.01%. (b) N.A. (iii) 23.10.1956. (iv) (a) Victory ploughing followed by desi ploughing. (b) to (e) N.A. (v) 10 tons/ac. of F.Y.M.+40 lb./ac. of P2O5. (vi) Up-to-date (early). (vii) As per treatments. (viii) Earthing up and weeding. (ix) 20.11.1956. (x) 13.2.1957.

2. TREATMENTS:
   All combinations of (1), (2) and (3) (1) 3 deltas of irrigation: $I_1=17.5''$, $I_2=23.5''$ and $I_3=29.5''$. (2) 3 depths of irrigation: $D_1=2''$, $D_2=3''$ and $D_3=4''$. (3) 3 levels of N: $N_1=80$, $N_2=120$ and $N_3=160$ lb./ac.

3. DESIGN:
   (i) 3 partial confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 17.5''x40'. (b) 1/80.6. (v) Two rows in each plot. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Occurrence of bight in the month of January 1957. Copper Shell fungicide was used. (iii) Tuber yield. (iv) (a) 1955-1957. (b) No. (c) Yes. (v) (a) and (b) No. (vi) Nil. (vii) Two-way tables N.A.

5. RESULTS:
   (i) 7.09 tons/ac. (ii) 0.93 tons/ac. (iii) D effect is significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$I_1$</th>
<th>$I_2$</th>
<th>$I_3$</th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>$D_3$</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$N_3$</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_I$</td>
<td>8.83</td>
<td>9.31</td>
<td>8.70</td>
<td>9.46</td>
<td>8.78</td>
<td>8.60</td>
<td>9.04</td>
<td>9.10</td>
<td>8.70</td>
<td>9.95</td>
</tr>
<tr>
<td>$P_I$</td>
<td>8.24</td>
<td>9.14</td>
<td>8.96</td>
<td>9.43</td>
<td>8.97</td>
<td>7.95</td>
<td>8.34</td>
<td>8.81</td>
<td>9.20</td>
<td>8.78</td>
</tr>
<tr>
<td>Mean</td>
<td>8.82</td>
<td>9.28</td>
<td>8.90</td>
<td>9.46</td>
<td>9.15</td>
<td>8.49</td>
<td>8.50</td>
<td>9.30</td>
<td>9.29</td>
<td>9.03</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.22 tons/ac.
Object: To study the optimum water requirements in relation to depth of irrigation and nitrogen levels on Potato.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 30.10.1957 and 1.11.1957. (iv) (a) 4 desi ploughings, double discing and grubbing. (b) to (e) N.A. (vi) Nil. (vii) Up-to-date. (viii) Irrigated. (ix) 1 weeding, earthing before and after irrigation. (x) N.A. (x) 20.2.1958 to 12.3.1958.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A/S: N1=80, N2=120 and N3=160 tons/ac.
   (2) 3 levels of depth of irrigation: D1=2", D2=3" and D3=4".
   (3) 3 levels of irrigation: I1=20", I2=28" and I3=36" per ac.

3. DESIGN:
   (i) 3° confd. partially. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 40′×18′. (b) 33′×9′. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Attack of frost and blight. (iii) Yield of tuber. (iv) to (vi) N.A. (vii) Potassium deficiency was observed in early January.

5. RESULTS:
   (i) 11.28 tons/ac. (ii) 0.79 tons/ac. (iii) Only main effect of I is significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>I1</td>
<td>11.25</td>
<td>10.46</td>
<td>10.69</td>
<td>10.80</td>
</tr>
<tr>
<td>I2</td>
<td>11.07</td>
<td>11.59</td>
<td>10.43</td>
<td>11.03</td>
</tr>
<tr>
<td>I3</td>
<td>12.01</td>
<td>12.77</td>
<td>11.21</td>
<td>12.00</td>
</tr>
<tr>
<td>Mean</td>
<td>11.44</td>
<td>11.61</td>
<td>10.78</td>
<td>11.28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
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<td>N2</td>
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<td>10.27</td>
</tr>
<tr>
<td>N3</td>
<td>11.36</td>
<td>11.83</td>
<td>11.36</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.19 tons/ac.
S.E. of body of any table = 0.32 tons/ac.

Object: To study the relative efficacy of 2, 4-D M.C.P.A. and methods of planting on the weeds and yield of Potato.

1. BASAL CONDITIONS:
   (i) to (iii) N.A. (iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (vi) to (vii) N.A. (viii) As per treatments. (x) and (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of 2, 4-D: D0=0, D1=6 and D2=12 ozs/ac.
   (2) 3 levels of M.C.P.A.: M0=0, M1=6 and M2=12 ozs/ac.
   (3) 3 cultural treatments: C1=Sowing on flat and earthing late, C2=Early ridging but no earthing and C3=Early ridging and earthing late.
3. DESIGN:
(i) 3 partially confd. confounding DMC² and DM²C. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A.
(ii) 2. (iv) (a) N.A. (b) 20' x 16'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Tuber yield (iv) (a) 1957—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 9.60 tons/ac. (ii) 0.67 tons/ac. (iii) Main effect of M and interaction DMC² are highly significant. Main effect of C and interaction D x M, D x C and M x C are significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>Mean</th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>10.02</td>
<td>9.44</td>
<td>9.80</td>
<td>9.75</td>
<td>8.90</td>
<td>10.47</td>
</tr>
<tr>
<td>D₂</td>
<td>10.58</td>
<td>8.72</td>
<td>8.64</td>
<td>9.31</td>
<td>8.79</td>
<td>9.69</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.16 tons/ac.
S.E. of body of any table = 0.27 tons/ac.

**Crop:** Potato (Rabi).
**Site:** Indian Agri. Res. Instt., New Delhi.
**Ref.:** I.A.R.I. 58(38).
**Type:** ‘CD’.

Object:—To study the relative efficacy of 2, 4—D, M.C.P.A. and methods of planting on weeds and yield of Potato.

1. BASAL CONDITIONS to 4. GENERAL:
Same as in expt. no. 57(36) on page 401.

5. RESULTS:
(i) 8.07 tons/ac. (ii) 0.62 tons/ac. (iii) Main effects of M, C and interaction D x M are highly significant. Main effect of D and interactions M x C and D x M x C are significant. (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>Mean</th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₀</td>
<td>7.98</td>
<td>8.43</td>
<td>8.11</td>
<td>8.17</td>
<td>7.62</td>
<td>8.83</td>
</tr>
<tr>
<td>D₁</td>
<td>9.31</td>
<td>7.73</td>
<td>7.83</td>
<td>8.29</td>
<td>7.29</td>
<td>8.94</td>
</tr>
<tr>
<td>D₂</td>
<td>8.47</td>
<td>7.70</td>
<td>7.08</td>
<td>7.75</td>
<td>6.95</td>
<td>8.20</td>
</tr>
<tr>
<td>Mean</td>
<td>8.59</td>
<td>7.95</td>
<td>7.67</td>
<td>8.07</td>
<td>7.29</td>
<td>8.66</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.15 tons/ac.
S.E. of body of any table = 0.25 tons/ac.
Crop :- Potato.


Object :-To study the relative effectiveness of 2, 4-D, methods of planting and earthing up on the weeds control and yield of Potato.

1. BASAL CONDITIONS:
   (i) to (iii) N.A. (iv) (a) N.A. (b) As per treatments. (v) to (vii) N.A. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2):
   (1) 3 methods of planting: M₁ = Flat, M₂ = Early ridge and M₃ = Sowing on ridge.
   (2) 2 earthing treatments: E₁ = No earthing and E₂ = Earthing.
   (3) 2 applications of 2, 4-D: D₁ = No application and D₂ = 2, 4-D application.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 20' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Tubber yield. (iv) a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 9.03 tons/ac. (ii) 0.21 tons/ac. (iii) All effects are highly significant. (iv) Av. yield of tubber in tons/ac.

<table>
<thead>
<tr>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>Mean</th>
<th>E₁</th>
<th>E₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>7.48</td>
<td>8.44</td>
<td>9.39</td>
<td>8.44</td>
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<td>8.37</td>
<td>9.64</td>
<td>10.85</td>
<td>9.62</td>
<td>9.15</td>
</tr>
<tr>
<td>Mean</td>
<td>7.92</td>
<td>9.04</td>
<td>10.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E₁</td>
<td>6.73</td>
<td>8.10</td>
<td>9.35</td>
<td>9.03</td>
<td>8.06</td>
</tr>
<tr>
<td>E₂</td>
<td>9.12</td>
<td>9.98</td>
<td>10.89</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   S.E. of D or E marginal mean = 0.04 tons/ac.
   S.E. of M marginal mean = 0.07 tons/ac.
   S.E. of body of D x E table = 0.06 tons/ac.
   S.E. of body of M x D or M x E table = 0.07 tons/ac.

---

Crop :- Potato.


Object :-To study the effect of cultural and chemical methods for control of weeds in Potato.

1. BASAL CONDITIONS:
   (i) to (iii) N.A. (iv) (a) N.A. (b) As per treatments. (v) to (vii) N.A. (viii) As per treatments. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2):
   (1) 4 weedicidal treatments: M₁ = Control, M₂ = 1 lb./ac. of 2, 4-D at pre-sowing stage, M₃ = 8 ozs./ac. of 2, 4-D at pre-emergence stage and M₄ = Pre-sowing + pre-emergence.
   (2) 4 cultural treatments: C₁ = Flat sowing + earthing late, C₂ = Flat sowing + early earthing, C₃ = Sowing on ridges and earthing late and C₄ = Sowing on ridges + earthing late.

Sub-plot treatments:
   2 methods of sowing: B₁ = Placement and B₂ = Broadcast.
3. DESIGN:
(i) Split-plot. (ii) (a) 16 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 20' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Tuber yield. (iv) (a) N.A. (b) 20' X 12'. (v) N.A. (vi) Yes. (vii) Nil. (viii) to (xii) Nil.

5. RESULTS:
(i) 8.35 tons/acre. (ii) (a) 1.01 tons/acre. (b) 0.80 tons/acre. (iii) Main effects of C and B are highly significant. (iv) Avg. yield of tuber in tons/acre.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>Mean</th>
<th>B₁</th>
<th>B₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>C₁</td>
<td>8.09</td>
<td>8.72</td>
<td>8.00</td>
<td>8.69¹</td>
<td>8.25</td>
<td>8.32</td>
<td>8.18</td>
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<tr>
<td>C₂</td>
<td>7.91</td>
<td>8.68</td>
<td>8.59</td>
<td>8.27</td>
<td>8.21</td>
<td>8.54</td>
<td>7.89</td>
</tr>
<tr>
<td>C₃</td>
<td>9.36</td>
<td>8.06</td>
<td>8.96</td>
<td>9.37</td>
<td>8.93</td>
<td>9.39</td>
<td>8.48</td>
</tr>
<tr>
<td>C₄</td>
<td>7.89</td>
<td>7.74</td>
<td>8.46</td>
<td>8.00</td>
<td>8.02</td>
<td>8.32</td>
<td>7.73</td>
</tr>
<tr>
<td>Mean</td>
<td>8.31</td>
<td>8.02</td>
<td>8.50</td>
<td>8.00</td>
<td>8.35</td>
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<td>8.44</td>
<td>8.31</td>
<td>8.78</td>
<td>9.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B₂</td>
<td>8.19</td>
<td>7.75</td>
<td>8.23</td>
<td>8.11</td>
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<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M or C marginal means = 0.25 tons/acre.
2. B marginal means = 0.14 tons/acre.
3. B means at the same level of M or C = 0.28 tons/acre.
4. M or C means at the same level of B = 0.64 tons/acre.
S.E. of M × C table = 0.30 tons/acre.

Crop = Potato.
Site = Indian Agric. Res. Instt., New Delhi.
Type = DCM.

Object: To study the effect of M.C.P.B., A/S and cultural practices on weeds and yield of Potato.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Cowpea. (c) Nil. (ii) (a) Medium loam. (b) N.A. (iii) 21.10.1956. (iv) (a) to (c) N.A. (v) 30 lb./ac. of P₂O₅ as Super-20 lb./ac. of K₂O as Pot. Sol. broadcasted before planting. (vi) D.R.R. (medium). (vii) Irrigated. (viii) N.A. (ix) 5.59". (x) 27.3.1957.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 4 methods of application of 80 lb./ac. of N as A/S: M₀=Control, M₁=As solid, M₂=As liquid and M₃=½ as solid+½ as liquid.
(2) 2 levels of M.C.P.B.: L₀=0 and L₁=8 oz./ac.
(3) 2 cultural treatments: C₁=Potato tuber planted on flat and earthed up after 6 weeks and C₂=Potato earthed up immediately after planting.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 26' x 22'. (b) 20' x 16'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Prebenox was sprayed as a preventive measure against early blight. (iii) Tuber yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 9.92 tons/acre. (ii) 1.00 tons/acre. (iii) Main effect of M and interaction M × C are highly significant. Main effects of C, L and interaction M × L and C × L are significant. (iv) Avg. yield of tuber in tons/acre.
Crop: Potato.


Ref: I.A.R.I. 56(29).

Type: DCM'.

Object: To study the relative effectiveness of 2, 4-D, M.C.P.A. and methods of planting on weeds and yield of Potato crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cowpeas. (c) Nil. (ii) (a) Medium loam. (b) N.A. (iii) 20.10.1956. (iv) (a) to (e) N.A. (v) 80 lb./ac. of N as A:S 1 applied at planting and 1 at earthing up. 30 lb./ac. of P_2O_5 as Super applied at planting and 20 lb./ac. of K_2O as Pot. Sul. applied broadcast before planting. (vi) D.R.R. (medium). (vii) Irrigated. (viii) N.A. (ix) 5.59". (x) 26.3 1957.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of 2, 4-D: D_0 = 0, D_1 = 6 and D_2 = 12 ozs./ac.
   (2) 3 levels of M.C.P.A.: M_0 = 0, M_1 = 6 and M_2 = 12 ozs./ac.
   (3) 3 cultural treatments: C_1 = Customary method of sowing (sowing on flat and then ridged up after 6 weeks), C_2 = Sown on flat, then ridged up immediately after planting and left undisturbed till harvest and C_3 = RIdged immediately after planting and again ridged up at 6 weeks.

3. DESIGN:
   (i) 3 rep. (ii) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 26'×22'. (b) 20'×16'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Perenox was sprayed as a preventive measure against early blight. (iii) Weed count was taken at regular intervals. Tubber formation, number and weight of tubbers, length and weight of shoot were recorded at fortnightly intervals. (iv) (a) 1556—N.A. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) D×M table is N.A.

5. RESULTS:
   (i) 9.50 tons/acre. (ii) 1.15 tons/acre. (iii) N.A. (iv) Av. yield of tubbers in tons/acre.

<table>
<thead>
<tr>
<th></th>
<th>D_0</th>
<th>D_1</th>
<th>D_2</th>
<th>Mean</th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_1</td>
<td>8.76</td>
<td>8.31</td>
<td>7.71</td>
<td>8.06</td>
<td>8.05</td>
<td>9.51</td>
<td>6.63</td>
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<tr>
<td>C_2</td>
<td>9.35</td>
<td>10.34</td>
<td>9.73</td>
<td>9.81</td>
<td>10.02</td>
<td>10.30</td>
<td>9.11</td>
</tr>
<tr>
<td>C_3</td>
<td>10.52</td>
<td>11.22</td>
<td>10.12</td>
<td>10.62</td>
<td>10.64</td>
<td>11.51</td>
<td>9.71</td>
</tr>
<tr>
<td>Mean</td>
<td>9.54</td>
<td>9.96</td>
<td>8.99</td>
<td>9.50</td>
<td>9.57</td>
<td>10.44</td>
<td>8.48</td>
</tr>
</tbody>
</table>
Crop :- Carrot.


Object :- To study the effect of depth of cultivation with and without inversion and effect of different fertilizers and their method of application on the yield of Carrot.

1. BASAL CONDITIONS :
(i) and (ii) N.A. (iii) 21.10.1954. (iv) (a) As per treatments. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 31.1.1955 to 17.2.1955.

2. TREATMENTS :
Main-plot treatments :
All combinations of (1) and (2)
(1) 3 methods of cultivation: C1 = Tractor ploughing 9" to 10" deep followed by grubbing, C2 = Bullock victory plough 5" to 6" deep followed by country plough and C3 = Country plough 4" to 5" deep.
(2) 2 methods of application : T1 = Placement with plough hole and T2 = Broadcast.
Sub-plot treatments :
3 manurial treatments: N1 = 80 lb./ac. of N + 80 lb./ac. of P2O5 + 40 lb./ac. of K2O, N2 = 120 lb./ac. of N + 80 lb./ac. of P2O5 + 40 lb./ac. of K2O and N3 = 120 lb./ac. of N.

3. DESIGN :
(i) Split-plot. (ii) 6 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 52' X 13'. (v) N.A. (v) Yes.

4. GENERAL :
(i) N.A. (ii) Nil. (iii) Yield of Carrot. (iv) (a) 1952--1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) a and (vii) Nil.

5. RESULTS :
(i) 8.20 tons/ac. (ii) (a) 1.827 tons/ac. (b) 1.495 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of carrot in tons/ac.

<table>
<thead>
<tr>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>Mean</th>
<th>T1</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>7.81</td>
<td>9.18</td>
<td>7.18</td>
<td>8.06</td>
<td>8.02</td>
</tr>
<tr>
<td>N2</td>
<td>8.63</td>
<td>8.79</td>
<td>8.78</td>
<td>8.73</td>
<td>8.73</td>
</tr>
<tr>
<td>N3</td>
<td>7.80</td>
<td>7.95</td>
<td>7.66</td>
<td>7.80</td>
<td>8.13</td>
</tr>
<tr>
<td>Mean</td>
<td>8.08</td>
<td>8.64</td>
<td>7.87</td>
<td>8.20</td>
<td>8.29</td>
</tr>
<tr>
<td>T1</td>
<td>8.84</td>
<td>8.45</td>
<td>7.59</td>
<td>8.20</td>
<td>8.29</td>
</tr>
<tr>
<td>T2</td>
<td>7.32</td>
<td>8.83</td>
<td>8.15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. C marginal means 0.327 tons/ac. 5. C means at the same level of N 0.807 tons/ac.
2. T marginal means 0.431 tons/ac. 6. N means at the same level of T 0.610 tons/ac.
3. N marginal means 0.132 tons/ac. 7. T means at the same level of C 0.658 tons/ac.
4. N means at the same level of C 0.748 tons/ac. S.E. of body of C x T table 0.527 tons/ac.
Crop: Carrot (Rabi).


Ref: I.A.R.I. 55(17).

Type: 'CM'.

Object: To study the effect of depth of cultivation with and without inversion and effect of different fertilizers and their method of application on the yield of Carrot.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 27.10.1955 and 29.10.1915. (iv) (a) As per treatments. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings and thinnings. (ix) N.A. (x) 27th Feb. to 9 March, 1955.

2. TREATMENTS:
   Same as in exp. no. 54(32) on page 406.

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 52' x 13', (b) 50' x 11'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of carrot. (iv) (a) 1932--1916. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 8.14 tons/ac. (ii) (a) 1.330 tons/ac. (b) 1.06 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of carrot in tons/ac.

\[
\begin{array}{ccc|ccc|ccc}
 & C_1 & C_2 & C_3 & \text{Mean} & T_1 & T_2 \\
N_1 & 7.74 & 8.20 & 8.77 & 8.27 & 8.09 & 8.44 \\
N_2 & 8.22 & 8.21 & 7.60 & 8.01 & 8.11 & 7.91 \\
N_3 & 8.52 & 8.25 & 7.70 & 8.16 & 8.40 & 7.92 \\
\text{Mean} & 8.16 & 8.25 & 8.02 & 8.14 & 8.20 & 8.09 \\
T_1 & 8.51 & 8.59 & 7.49 & 5. & 5. & 5. \\
T_2 & 7.81 & 7.91 & 8.55 & 5. & 5. & 5. \\
\end{array}
\]

S.E. of difference of two
1. C marginal means
2. T marginal means
3. N marginal means
4. N means at the same level of C

Crop: Carrot.


Ref: I.A.R.I. 56(30).

Type: 'CM'.

Object: To study the effect of depth of cultivation with and without inversion and effect of different fertilizers and their method of application on the yield of Carrot.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Maize for fodder. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 26.10.1956. (iv) (a) As per treatments. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Sandy half-hill. (viii) Irrigated. (ix) Weeding. (x) 9.2.1957 to 9.4.1957.

2. TREATMENTS:
   Same as in exp. no. 54(12) on page 406.

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 52' x 13', (b) 50' x 11'. (v) 1' x 1'. (vi) Yes.
4. GENERAL:
(i) Good. (ii) N.A. (iii) Yield of carrot. (iv) (a) 1952–1956. (b) Nil. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 17.85 tons/ac. (ii) (a) 3.80 tons/ac. (b) 1.80 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of carrot in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>T1</th>
<th>T2</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>17.45</td>
<td>18.35</td>
<td>17.74</td>
<td>18.00</td>
<td>17.70</td>
<td>18.47</td>
<td>17.36</td>
<td>17.72</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.776 tons/ac.</td>
<td>0.633 tons/ac.</td>
<td>0.368 tons/ac.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Crop: Cauliflower.  
Type: 'M'.

Object: To study the effect of application of different levels of N, P and molybdenum on Cauliflower.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 30.10.1955 and 2.12.1955. (iv) (a) Ploughing by victory plough discing and ploughing by tractor and ploughing by desi plough. (b) Planting. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 3 intercultures, earthing and weeding. (ix) N.A. (x) 27.2.1956 to 17.3.1956.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(i) 3 levels of N as A/S: N0=0, N1=60 and N2=120 lb./ac.
(ii) 3 levels of P2O5 as Super: P0=0, P1=40 and P2=80 lb./ac.
(iii) 3 levels of molybdenum as acid molybdenum: M0=0, M1=1 and M2=2 lb./ac.

3. DESIGN:
(i) 3 conf. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 18"×18". (v) N.A. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Merry aphid attack. (iii) Yield of cauliflower. (iv) (a) 1955–1957. (b) N.A. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 2.63 tons/ac. (ii) 1.06 tons/ac. (iii) Main effect of P is highly significant and interaction N X P is significant. (iv) Av. yield of cauliflower in tons/ac.

<table>
<thead>
<tr>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>Mean</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>2.21</td>
<td>2.46</td>
<td>2.45</td>
<td>2.37</td>
<td>2.74</td>
<td>2.00</td>
</tr>
<tr>
<td>N1</td>
<td>1.16</td>
<td>3.01</td>
<td>3.70</td>
<td>2.62</td>
<td>2.34</td>
<td>2.48</td>
</tr>
<tr>
<td>N2</td>
<td>2.18</td>
<td>2.51</td>
<td>4.01</td>
<td>2.90</td>
<td>2.87</td>
<td>3.09</td>
</tr>
<tr>
<td>Mean</td>
<td>1.85</td>
<td>2.66</td>
<td>3.39</td>
<td>2.63</td>
<td>2.65</td>
<td>2.52</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M0</th>
<th>M1</th>
<th>M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>M0</td>
<td>2.10</td>
<td>2.93</td>
</tr>
<tr>
<td>M1</td>
<td>1.38</td>
<td>2.35</td>
</tr>
<tr>
<td>M2</td>
<td>2.08</td>
<td>2.71</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.31 tons/ac.  
S.E. of body of any table = 0.45 tons/ac.
Crop: Cauliflower.  
Type: 'M'.

Object: To study the effect of application of different levels of N, P and Molybdenum on Cauliflower.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Lobia. (c) Nil. (ii) (a) and (b) N.A. (iii) 30.10.1956. (iv) (a) 3 ploughings with country plough after inversion with Victory plough. (b) Transplanting. (c) to (e) N.A. (vi) Nil. (vii) Irrigated. (viii) 20 tons/ac. of F.Y. M. one month prior to transplanting. (ix) Sultan's snowball. (x) Yes.

2. TREATMENTS:
   Same as in expt. no. 55(18) on page 408.

3. DESIGN:
   (i) 3' partially confd. confounding NPM² and NPM components of 3 factor interaction. (ii) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 20'×18'. (b) 18'×16'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Light attack of aphids. (iii) Yield of cauliflower. (iv) (a) 1955-1957. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Two-way tables are not available.

---

<table>
<thead>
<tr>
<th>P&lt;sub&gt;N&lt;/sub&gt;</th>
<th>P&lt;sub&gt;P&lt;/sub&gt;</th>
<th>P&lt;sub&gt;M&lt;/sub&gt;</th>
<th>Mean</th>
<th>M&lt;sub&gt;1&lt;/sub&gt;</th>
<th>M&lt;sub&gt;2&lt;/sub&gt;</th>
<th>M&lt;sub&gt;3&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>N&lt;sub&gt;1&lt;/sub&gt;</td>
<td>4.20</td>
<td>5.98</td>
<td>5.57</td>
<td>5.25</td>
<td>5.68</td>
<td>5.21</td>
</tr>
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<td>N&lt;sub&gt;2&lt;/sub&gt;</td>
<td>4.10</td>
<td>6.55</td>
<td>6.51</td>
<td>5.72</td>
<td>5.34</td>
<td>6.68</td>
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<tr>
<td>N&lt;sub&gt;3&lt;/sub&gt;</td>
<td>5.04</td>
<td>6.10</td>
<td>7.91</td>
<td>6.25</td>
<td>6.25</td>
<td>6.85</td>
</tr>
<tr>
<td>Mean</td>
<td>4.45</td>
<td>6.21</td>
<td>6.66</td>
<td>5.77</td>
<td>5.42</td>
<td>5.95</td>
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</table>

S.E. of any marginal mean = 0.44 tons/ac.  
S.E. of body of any table = 0.75 tons/ac.  

---

Crop: Cauliflower.  
Ref: I.A.R.I. 56(31).  
Type: 'M'.

Object: To study the effect of application of different levels of N, P and Molybdenum on Cauliflower.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Lobia. (c) Nil. (ii) (a) and (b) N.A. (iii) 30.10.1956. (iv) (a) 3 ploughings with country plough after inversion with Victory plough. (b) Transplanting. (c) to (e) N.A. (vi) 20 tons/ac. of F.Y. M. one month prior to transplanting. (vii) Sultan's snowball. (viii) Irrigated. (ix) Yes—February—March, 1957.

2. TREATMENTS:
   Same as in expt. no. 55(18) on page 408.

3. DESIGN:
   (i) 3' partially confd. confounding NPM² and NPM components of 3 factor interaction. (ii) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 20'×18'. (b) 18'×16'. (v) 1'×1'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Light attack of aphids. (iii) Yield of cauliflower. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Two-way tables are not available.
5. RESULTS:
(i) 3.47 tons/ac.  (ii) 1.01 tons/ac.  (iii) N and P effects are highly significant.  (iv) Av. yield of cauliflower in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N</th>
<th>N</th>
<th>N</th>
<th>P</th>
<th>P</th>
<th>P</th>
<th>M</th>
<th>M</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2.79</td>
<td>3.74</td>
<td>3.87</td>
<td>2.67</td>
<td>3.87</td>
<td>3.87</td>
<td>3.38</td>
<td>3.69</td>
<td>3.34</td>
</tr>
<tr>
<td>S.E. (mean)</td>
<td>= 0.24 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Cauliflower.  
Type: ‘M’.

Object: To test the response of Cauliflower to different levels of N, P fertilizers and Molybdenum on Cauliflower.

1. BASAL CONDITIONS:
(i) and (ii) N.A.  (iii) 14.11.1957.  (iv) (a) 4 discings with tractor and 2 beamings. (b) Transplanting. (c) N.A. (d) 2’x2’. (e) N.A. (f) and (g) N.A. (h) Irrigated. (v) 2 weedings. (ix) N.A. (x) 2 to 19.7.1958.

2. TREATMENTS and D. DESIGN:
Same as in exp. no. 55(13) on page 400.

4. GENERAL:
(i) Fair.  (ii) Attack of aphids.  (iii) Yield of cauliflower.  (iv) (a) 1955—1957.  (b) No.  (c) Nil.  (d) No.  (e) and (f) Nil.

5. RESULTS:
(i) 5.95 tons/ac.  (ii) 1.26 tons/ac.  (iii) Main effect of N and P are highly significant.  (iv) Av. yield of cauliflower in tons/ac.

<table>
<thead>
<tr>
<th>P_0</th>
<th>P_1</th>
<th>P_2</th>
<th>Mean</th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>N_0</td>
<td>3.92</td>
<td>4.16</td>
<td>4.23</td>
<td>4.10</td>
<td>4.43</td>
<td>3.84</td>
</tr>
<tr>
<td>N_1</td>
<td>4.30</td>
<td>3.00</td>
<td>7.46</td>
<td>6.25</td>
<td>6.20</td>
<td>6.54</td>
</tr>
<tr>
<td>N_2</td>
<td>6.23</td>
<td>8.04</td>
<td>8.21</td>
<td>7.50</td>
<td>7.71</td>
<td>7.15</td>
</tr>
<tr>
<td>Mean</td>
<td>4.82</td>
<td>6.40</td>
<td>6.63</td>
<td>5.95</td>
<td>6.11</td>
<td>5.84</td>
</tr>
<tr>
<td>M_3</td>
<td>4.50</td>
<td>7.06</td>
<td>6.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M_4</td>
<td>4.27</td>
<td>6.36</td>
<td>6.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M_5</td>
<td>5.70</td>
<td>5.78</td>
<td>6.22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.36 tons/ac.  
S.E. of body of any table = 0.51 tons/ac.  

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Crop: Tomato (Rabi).  
Ref: I.A.R.I. 55(21).  
Type: ‘M’.

Object: To study the effect of different levels of N, P and different times of application of N on Tomato.

1. BASAL CONDITIONS:
(i) and (ii) N.A.  (iii) 20.11.1955.  (iv) (a) Ploughings by soil inversion plough, desi plough and tripal followed by submer. (b) Floating. (c) to (e) N.A.  (f) Nil.  (g) to (i) N.A.  (iv) Hoeing and weeding.  (ix) N.A.  (x) March, April and May, 1956.
2. TREATMENTS:

All combinations of (1), (2), and (3) + control (one plot in each block)
(1) 3 levels of N as A/S: N1 = 30, N2 = 60 and N3 = 90 lb/ac.
(2) 3 levels of P2O5 as Super: P1 = 20, P2 = 40 and P3 = 60 lb/ac.
(3) 3 times of application: T1 = Full dose at planting, T2 = at planting + after 6 weeks of planting and T3 = at planting + after 6 weeks of planting + at flowering.

3. DESIGN:

(i) 3 rep. (ii) 10 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 20' x 18' 4". (b) 18' x 16' 4". (v) 1' on each side. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Mild attack of virus and earworm. (iii) Yield of vegetables. (iv) (a) 1955 - N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 6.63 tons/ac. (ii) 0.85 tons/ac. (iii) Main effect of N, P and 'control vs. others' are highly significant. (iv) Av. yield of tomato in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>Mean</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>5.17</td>
<td>5.54</td>
<td>6.27</td>
<td>5.66</td>
<td>5.78</td>
<td>5.59</td>
<td>5.62</td>
</tr>
<tr>
<td>N2</td>
<td>5.68</td>
<td>6.66</td>
<td>7.82</td>
<td>6.72</td>
<td>6.31</td>
<td>6.28</td>
<td>7.57</td>
</tr>
<tr>
<td>N3</td>
<td>6.49</td>
<td>7.51</td>
<td>8.52</td>
<td>7.51</td>
<td>7.24</td>
<td>7.67</td>
<td>7.61</td>
</tr>
<tr>
<td>Mean</td>
<td>5.78</td>
<td>6.37</td>
<td>7.54</td>
<td>6.63</td>
<td>6.44</td>
<td>6.52</td>
<td>6.93</td>
</tr>
<tr>
<td>T1</td>
<td>5.45</td>
<td>6.42</td>
<td>7.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>5.52</td>
<td>6.57</td>
<td>7.46</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T3</td>
<td>6.36</td>
<td>6.73</td>
<td>7.71</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.29 tons/ac.
S.E. of body of any table or control mean = 0.33 tons/ac.

Crop: Tomato ('Rahi').
Type: 'M'.

Ref: I.A.R.I. 55(21).

Objec: To study the effect of different levels of N, P and different times of application of N on Tomato.

1. BASAL CONDITIONS:

(i) N.A. (ii) 204.1955, (iv) (a) 2 ploughings by desi plough, 1 ploughing by Victory plough and discing. (b) Planting. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 hoeings, 5 weedings and 2 earthings. (ix) N.A. (x) February to April, 1956.

2. TREATMENTS:

Same as in exp. no. 55(21) on page 410.

3. DESIGN:

(i) 3 rep. (ii) (a) 10 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 1/120 ac. (b) 1/150 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Fruit borer, ashid and ear worm attack. (iii) Yield of tomato. (iv) (a) 1955. (b) N.A. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 8.69 tons/ac. (ii) 0.77 tons/ac. (iii) Main effect of N is highly significant. Interaction P x T and 'control vs. others' are significant. (iv) Av. yield of tomato in tons/ac.
Crop : Tomato (Rabi).


Ref : I.A.R.I. 57(38).

Type : 'M'.

Object : To study the effect of N and P as spray and soil application on Tomato.

1. BASAL CONDITIONS:
(i) to (x) N.A.

2. TREATMENTS:
22 manural treatments: $M_0 =$Control, $M_4 = 30$ lb./ac. of N as soil application, $M_8 = 2 M_4$, $M_9 = 4 M_4$, $M_{16} = 20$ lb./ac. of P2O5 applied to soil, $M_3 = 2 M_8$, $M_5 = 2 M_9$, $M_6 = M_3 + M_4$, $M_7 = M_5 + M_4$, $M_11 = M_3 + M_9$, $M_{12} = 20$ lb./ac. of N in 2% spray applied in 4 instalments, $M_{13} = 2 M_4$, $M_4 = 30$ lb./ac. of N as 4% spray applied in 4 instalments, $M_{14} = 2 M_4$, $M_{15} = 20$ lb./ac. of P2O5 in 2% spray applied in 4 instalments, $M_{14} = 2 M_4$, $M_{15} = 30$ lb./ac. of N as 4% spray applied in 4 instalments, $M_{16} = 2 M_4$, $M_{17} = 30$ lb./ac. of P2O5 in 4% spray applied in 4 instalments, $M_{18} = 30$ lb./ac. of N in 4% spray applied in 4 instalments, $M_{19} = 60$ lb./ac. of P2O5 in 4% spray applied in 4 instalments and $M_{20} = 60$ lb./ac. of P2O5 in 4% spray applied in 4 instalments.

N applied as urea and P2O5 as triple Super.

3. DESIGN:
(i) R.B.D. (ii) (a) 22. (b) N.A. (iii) 3. (iv) (a) 50'x12.5'. (b) 48'x7.5'. (v) 1'x2.5'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) No. (iii) Yield of tomato. (iv) (a) 1957—N.A. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS:
(i) 10.74 tons/ac. (ii) 2.41 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tomato in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_4$</th>
<th>$M_8$</th>
<th>$M_9$</th>
<th>$M_{10}$</th>
<th>$M_{12}$</th>
<th>$M_{14}$</th>
<th>$M_{16}$</th>
<th>$M_{18}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>6.15</td>
<td>9.45</td>
<td>12.52</td>
<td>14.20</td>
<td>8.31</td>
<td>7.61</td>
<td>8.62</td>
<td>7.70</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_{11}$</th>
<th>$M_{15}$</th>
<th>$M_{17}$</th>
<th>$M_{19}$</th>
<th>$M_{20}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>15.19</td>
<td>11.70</td>
<td>9.24</td>
<td>11.36</td>
<td>12.77</td>
</tr>
</tbody>
</table>

S.E./mean = 1.40 tons/ac.
Crop :- Tomato.


Object :- To study the effect of N and P as spray and soil application on Tomato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 28 and 30.1.1959. (iv) 1 double discing with tractor, 1 ploughing with Victory plough, 1 ploughing with desi plough and triphal. (b) Transplanting. (c) to (e) N.A. (vi) 10 tons/ac. of F.Y.M. (vii) N.A. (viii) Irrigated. (ix) N.A. (x) 17 pickings from 30.4.1959 to 20.6.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 57(38) on page 412.

4. GENERAL:
   (i) Poor. (ii) Nil. (iii) Yield of tomato. (iv) (a) 1957—N.A. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS:
   (i) 9.10 tons/acre. (ii) N.A. (iii) Treatment differences are significant. (iv) Av. yield of tuber in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mn</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>6.23</td>
<td>9.35</td>
<td>10.43</td>
<td>9.75</td>
<td>8.60</td>
<td>8.24</td>
<td>8.62</td>
<td>8.31</td>
<td>8.78</td>
<td>11.13</td>
<td>10.45</td>
</tr>
<tr>
<td>Treatment</td>
<td>Mn1</td>
<td>M11</td>
<td>M12</td>
<td>M13</td>
<td>M14</td>
<td>M15</td>
<td>M16</td>
<td>M17</td>
<td>M18</td>
<td>M19</td>
<td>M20</td>
</tr>
<tr>
<td>Av. yield</td>
<td>13.20</td>
<td>9.61</td>
<td>7.75</td>
<td>8.74</td>
<td>5.44</td>
<td>10.74</td>
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<td>10.22</td>
<td>11.70</td>
<td>7.46</td>
<td>7.05</td>
</tr>
<tr>
<td>S.E./mean = N.A.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Crop :- Tomato.


Object :- To study the effect of N and P as spray and soil application on Tomato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 11.11.1959/16.1.1960 to 26.1.1960. (iv) 1 Victory ploughing and 1 double discing with tractor. (b) Transplanting. (c) to (e) N.A. (vi) N.A. (vii) Irrig. (viii) 2 hand weedings. (ix) N.A. (x) 26.4.1960 to 14.6.1960.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 57(38) on page 412.

4. GENERAL:
   (i) Poor. (ii) Nil. (iii) Yield of tomato. (iv) (a) 1957—N.A. (b) and (c) No. (v) and (vi) Nil. (vii) Crop was poor due to late planting. Some scorching was observed in 4% foliar spray plots specially in N and P combinations.

5. RESULTS:
   (i) 9.68 tons/acre. (ii) 1.64 tons/acre. (iii) Treatment differences are highly significant. (iv) Av. yield of tomato in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mn</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Mn1</td>
<td>M11</td>
<td>M12</td>
<td>M13</td>
<td>M14</td>
<td>M15</td>
<td>M16</td>
<td>M17</td>
<td>M18</td>
<td>M19</td>
<td>M20</td>
</tr>
</tbody>
</table>
| S.E./mean = 0.95 tons/acre.
Crop : Tomato.  
Ref : I.A.R.I. 59(29).  
Type : 'M'.

Object :- To find out the optimum levels of fertilizers for Tomato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) and (b) N.A.  (iii) 15.1.1959.  (iv) (a) 2 cross discings with tractor.  (b) Transplanting.  (c) to (e) N.A.  (v) 10 tons/ac. of F.Y.M.  (vi) N.A.  (vii) Irrigated.  (viii) 2 weedicings. 1 hoeing by Sharma hoe and earthing.  (ix) N.A.  (x) 25.4.1959 to 4.7.1959.

2 TREATMENTS:
   Main-plot treatments:
   All combinations of (1), (2) and (3) + control (3 plots)
   (1) 3 levels of N as A/S: N₁ = 40, N₂ = 80 and N₃ = 120 lb./ac.
   (2) 3 levels of P₂O₅ as Super: P₁ = 20, P₂ = 40 and P₃ = 60 lb./ac.
   (3) 3 levels of K₂O as Pot. Sul.: K₁ = 20, K₂ = 40 and K₃ = 60 lb./ac.

Sub-plot treatments:
   2 cultural treatments: F₁ = Flat beds and F₂ = Ridge.s.

3. DESIGN:
   (i) (3²+3) x 2 split-plot confd.  (ii) (a) 10 main-plots/block; 2 sub-plots/main-plot and 3 blocks/replication.  
   (b) N.A.  (iii) 2.  
   (iv) (a) 20' x 13.5'.  
   (b) 18' x 12'.  
   (v) 1' x 7.5'.  
   (vi) Yes.

4. GENERAL:
   (i) Good.  
   (ii) Nil.  
   (iii) Yield of tomato.  
   (iv) (a) 1959—N.A.  
   (b) and (c) No.  
   (v) to (vii) Nil.

5. RESULTS:
   (i) 5.71 tons/ac.  
   (ii) (a) 1.47 tons/ac.  
   (b) 1.10 tons/ac.  
   (iii) Only main effects of N, P and 'control vs. others' are highly significant.  
   (iv) Av. yield of tomato in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>F₁</th>
<th>F₂</th>
<th>F₃</th>
<th>K₁</th>
<th>K₂</th>
<th>K₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
<td>4.58</td>
<td>4.75</td>
<td>5.43</td>
<td>4.41</td>
<td>4.52</td>
<td>5.83</td>
<td></td>
</tr>
<tr>
<td>N₂</td>
<td>5.27</td>
<td>5.54</td>
<td>7.63</td>
<td>6.08</td>
<td>6.59</td>
<td>6.77</td>
<td></td>
</tr>
<tr>
<td>N₃</td>
<td>5.33</td>
<td>6.74</td>
<td>6.92</td>
<td>6.30</td>
<td>6.53</td>
<td>6.16</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>5.06</td>
<td>6.01</td>
<td>6.66</td>
<td>5.60</td>
<td>5.88</td>
<td>6.25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F₁</td>
<td>F₂</td>
<td>F₃</td>
<td>K₁</td>
<td>K₂</td>
<td>K₃</td>
<td>Mean</td>
</tr>
<tr>
<td>F₁</td>
<td>5.08</td>
<td>6.36</td>
<td>6.52</td>
<td>5.61</td>
<td>5.98</td>
<td>6.37</td>
<td></td>
</tr>
<tr>
<td>F₂</td>
<td>5.04</td>
<td>5.66</td>
<td>6.80</td>
<td>5.59</td>
<td>5.78</td>
<td>6.13</td>
<td></td>
</tr>
<tr>
<td>K₁</td>
<td>4.91</td>
<td>5.42</td>
<td>6.46</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>K₂</td>
<td>5.22</td>
<td>6.02</td>
<td>6.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K₃</td>
<td>5.01</td>
<td>6.19</td>
<td>7.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N, P or K marginal means = 0.35 tons/ac.
2. F marginal means = 0.21 tons/ac.
3. F means at the same level of N, P or K = 0.37 tons/ac.
4. N, P or K means at the same level of F = 0.43 tons/ac.
S.E. of body of N x P, N x K or P x K table = 0.43 tons/ac.

Crop : Tomato.  
Ref : I.A.R.I. 59(30).  
Type : 'M'.

Object :- To study the optimum moisture range and nitrogen levels under conditions of Shallow water table on Tomato.
1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 20.11.1959. (iv) (a) 1 ploughing by tractor, 1 discing and levelling.
   (b) to (e) N.A. (v) 60 lb./ac. of $P_2O_5$. (vi) N.A. (vii) As per treatments. (viii) 4 weedicides and 4 intercultures. (ix) N.A. (x) 9.4.1959 to 18.5.1959.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of moisture: $M_1$ = Moisture above 70% of the available moisture, $M_2$ = Moisture above 60% of the available moisture and $M_3$ = Moisture above 50% of the available moisture.
   (2) 3 levels of N: $N_1$ = 40, $N_2$ = 80 and $N_3$ = 120 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 9, (b) N.A. (iii) 4. (iv) (a) $33' \times 16'$. (b) $30' \times 12'$. (v) $1.5' \times 2'$. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Attack of virus disease and fruit borer. (iii) Yield of tomato. (iv) (a) 1959. (b) N.A. (c) No. (v) to (vii) Nil.

5. RESULTS:
   (i) 26.99 tons/ac. (ii) 2.60 tons/ac. (iii) Main effects of M and N are significant. (iv) Av. yield of tomato in tons/ac.

<table>
<thead>
<tr>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$N_3$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$M_1$</td>
<td>21.74</td>
<td>25.68</td>
<td>27.03</td>
</tr>
<tr>
<td>$M_2$</td>
<td>24.83</td>
<td>27.76</td>
<td>28.99</td>
</tr>
<tr>
<td>$M_3$</td>
<td>27.40</td>
<td>28.24</td>
<td>30.08</td>
</tr>
</tbody>
</table>

Mean 25.32 27.23 28.43 26.99

S.E. of any marginal mean = 0.75 tons/ac.
S.E. of body of table = 1.30 tons/ac.

---

Crop: Tomato (Rabi).
Object: To find out the optimum moisture range for maximum yield in Tomato, in relation to nitrogen levels.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 17 and 18.2.1959. (iv) (a) 3 ploughings and levelling twice. (b) Transplanting. (c) to (e) N.A. (v) 10 tons/ac. of F.Y.M. + 60 lb./ac. of $P_2O_5$ as Super + 60 lb/ac. of $K_2O$.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: $N_1$ = 40, $N_2$ = 80 and $N_3$ = 120 lb./ac.
   (2) 3 levels of irrigation: $I_1$ = 500, $I_2$ = 1,000 and $I_3$ = 50,000 ohms.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 9, (b) N.A. (iii) 3. (iv) (a) and (b) $22' \times 15'$. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal though the crop was considerably patchy. (ii) Nil. (iii) Yield of tomato. (iv) 1959: N.A.
   (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 9.82 tons/ac. (ii) 1.57 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of tomato in tons/ac.
Crop :- Gram.
Site :- Botanical Sub-Stat., Pusa.

Object :- To study the effect of N, P and K on Gram.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 24.10.1955. (iv) (a) Ploughing with E. plough, discing, harrowing, ploughing with des. plough, beaming and special fine harrowing and beaming. (b) to (e) N.A. (vi) Nil. (vii) N.P.—S
(viii) Unirrigated. (ix) Liver harrowing and 2 weedings. (x) N.A. (x) 5 to 7.4.1956.

2. TREATMENTS:
10 manured treatments : M 0 =Control, M 1 =8000 lb./ac. of P.Y.M., M 2 =40 lb./ac. of N as Rape cake, M 3 =40 lb./ac. of N as Amm. M 4 =20 lb./ac. of K 2 O as Pot. Sol., M 5 =80 lb./ac. of P 2 O 5 as Super, M 6 =M 3 +M 5 , M 7 =M 4 +M 6 , M 8 =M 6 +M 8 and M 9 =M 3 +M 8 .

3. DESIGN:
(i) R.B.D. (ii) 10. (b) N.A. (iii) 10. (iv) (a) and (b) 44' X 24'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Lodging was observed in thickly growth plots. (ii) Wilt attack, no control measure was taken. (iii) Yield of gram. (iv) (a) 1959—cond. (b) Yes. (c) N.A. (v) and (vi) Nil. (vii) The thick growth plant had very poor pod formation and the pods were eaten by insects.

5. RESULTS:
(i) 112.4 lb./ac. (ii) 195.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of gram in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M 0</th>
<th>M 1</th>
<th>M 2</th>
<th>M 3</th>
<th>M 4</th>
<th>M 5</th>
<th>M 6</th>
<th>M 7</th>
<th>M 8</th>
<th>M 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1110</td>
<td>1332</td>
<td>1089</td>
<td>1106</td>
<td>569</td>
<td>1266</td>
<td>1146</td>
<td>1077</td>
<td>1068</td>
<td>1008</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>61.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
3. DESIGN:
(i) R.B.D. (ii) 10. (b) N.A. (iii) 10. (iv) 36'X18'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Light attack of wilt. (iii) Yield of gram. (iv) (a) 1930—cond. (b) and (c) Nil. (v) and (vi) Nil. (vii) The year was dry in the early stage of rabi and it rained when the crop ripened. The west wind affected the crop much at the time of pod formation. The crop was dried and grains could not fully developed.

5. RESULTS:
(i) 161.3 lb./ac. (ii) Treatment differences are highly significant. (iv) Av. yield of gram in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₂</th>
<th>M₁</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>233</td>
<td>616</td>
<td>295</td>
<td>172</td>
<td>156</td>
<td>420</td>
<td>207</td>
<td>325</td>
</tr>
</tbody>
</table>

S.E./mean = 51.0 lb./ac.

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Crop = Gram (Rabi).
Object = To study the comparative efficiency of foliar and soil application of P and micronutrients on Gram yield.

1. BASAL CONDITIONS:
(i) to (v) N.A. (vi) N.P.—58. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
12 manurial treatments : M₅=Control, M₁=40 lb./ac. of P₂O₅ as soil application, M₂=1 lb./ac. of Mo as soil application, M₃=2 lb./ac. of B as soil application, M₄=5 lb./ac. of Cu as soil application, M₅=5 lb./ac. of Mo as soil application, M₆=3% solution of 40 lb./ac. of P₂O₅ in 3 sprays, M₇=3% solution of 1 lb./ac. of Mo in 3 sprays, M₈=3% solution of 1 lb./ac. of B in 3 sprays, M₉=3% solution of 1 lb./ac. of Cu in 3 sprays, M₁₀=3% solution of 1 lb./ac. of Mn in 3 sprays and M₁₁=3% solution of 1 lb./ac. of Mo+1 lb./ac. of B in 3 sprays. 40 lb./ac. of P₂O₅ as soil application was applied from M₄ to M₆ and 3% solution of 40 lb./ac. of P₂O₅ in 3 sprays was applied from M₇ to M₁₁.

3. DESIGN:
(i) R.B.D. (ii) 12. (b) N.A. (iii) 4. (iv) (a) 36'X18'. (b) 32'X12'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1938—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1141 lb./ac. (ii) 141.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₂</th>
<th>M₁</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
<th>M₁₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1123</td>
<td>1214</td>
<td>1171</td>
<td>904</td>
<td>1164</td>
<td>1242</td>
<td>1148</td>
<td>1229</td>
<td>1187</td>
<td>1064</td>
<td>1058</td>
</tr>
</tbody>
</table>

S.E./mean = 70.8 lb./ac.

---

Crop = Arhar.
Object = To study the effect of different spacings on different varieties of Arhar.
1. BASAL CONDITIONS:
(i) (a) No. (b) Wheat. (c) 20 and 40 lb/ac. of N as A/S. (ii) (a) Sandy loam. (b) N.A. (iii) 24.7.1956, and 25.7.1956. (iv) (a) Ploughings (b) to (c) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Weeding and hoeing with bullock. (ix) 22.28. (x) 24.5.1957 and 25.5.1957.

2. TREATMENTS:
Main-plot treatments:

Sub-plot treatments:
3 spacings between rows: S1 = 24', S2 = 34' and S3 = 44'.

3. DESIGN:
(i) Split-plot. (ii) 8 main-plots replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 25' x 7'. (b) 23' x 15'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Height, no. of branches, weight of 1000 grain. (iv) (a) 1956 contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Other two-way tables are N.A.

5. RESULTS:
(i) 56 lb/ac. (ii) (a) 347.0 lb/ac. (b) 83.7 lb/ac. (iii) Main effect of V is highly significant. (iv) Av. yield of arhar in lb/ac.

Crop: Arhar (Rabi).
Ref: I.A.R.I. 57(37).
Type: CMV.

Object: To study the effect of different spacings and different manures on different varieties of Arhar.
Crop :- Arhar (Kharif).
Object :- To study the effect of different spacings and different levels of manures on different varieties on Arhar.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 24 and 25.7.1958. (iv) (a) 1 Victory ploughing and 3 discings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings and 3 hoeings. (ix) N.A. (x) 9 and 10.4.1959.

2. TREATMENTS:
   Same as in expt. no. 57(37) on page 418.

3. DESIGN:
   (i) Split-plot. (ii) (a) 5 main-plots/replication; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 21'x14'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (j) N.A. (iii) Grain yield. (iv) (a) 1957—N.A. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 388 lb./ac. (ii) (a) 318.0 lb./ac. (b) 199.4 lb./ac. (c) 142.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>Mean</th>
<th>M6</th>
<th>M1</th>
<th>M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>455</td>
<td>457</td>
<td>457</td>
<td>457</td>
<td>388</td>
<td>388</td>
<td>381</td>
<td>395</td>
</tr>
</tbody>
</table>

   Mean yield of grain in lb./ac.

   S.E. of difference of two:
   1. V marginal means = 75.0 lb./ac. 6. S means at the same level of V = 58.2 lb./ac.
   2. M marginal means = 26.4 lb./ac. 7. V means at the same level of S = 85.7 lb./ac.
   3. S marginal means = 26.0 lb./ac. 8. S means at the same level of M = 45.0 lb./ac.
   4. M means at the same level of V = 81.4 lb./ac. 9. M means at the same level of S = 51.8 lb./ac.
   5. V means at the same level of M = 100.2 lb./ac.

Crop :- Sugarcane.
Object :- To study the effect of N, P and K on Sugarcane.

Ref :- I.A.R.I. 58(00).
Type :- 'CMV'.

Ref :- I.A.R.I. 59(02).
Type :- 'M'.
1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 31.3.1959 to 1.4.1959. (iv) (a) 1 Victory ploughing followed by desi ploughing. (b) to (e) N.A. (v) CO.—1104. (vi) Irrigated. (vii) 5 hoeings, 3 weedings and 1 earthing. (ix) N.A. (x) 25.2.1960 to 20.3.1960.

2. TREATMENTS:
All combinations of (1) and (2) + control
(1) 3 methods of application of manures: M1 = Soil application, M2 = Soil application + spray and M3 = Foliar application.
(2) 5 levels of manures: F1 = 40 lb/ac. of N, F2 = 80 lb/ac. of N, F3 = 120 lb/ac. of N + 40 lb/ac. of P2O5, F4 = 80 lb/ac. of N + 40 lb/ac. of P2O5 + 40 lb/ac. of K2O.

3. DESIGN:
(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 29.5'x23.0'. (b) 22.5'x21.5'. (v) 3.5':<0.75'. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Attack of top shoot borer. (iii) Cane yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Heavy rain during the period of spraying. (vii) There was scorching after spraying.

The plant population was not uniform and the stand was poor.

5. RESULTS:
(i) 25.70 tons/ac. (ii) 3.74 tons/ac. (iii) Control vs. others alone is significant. (iv) Ave. yield of cane in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>24.10</td>
<td>27.66</td>
<td>31.41</td>
<td>28.13</td>
<td>25.57</td>
<td>27.37</td>
</tr>
<tr>
<td>M4</td>
<td>23.39</td>
<td>26.25</td>
<td>27.92</td>
<td>23.47</td>
<td>25.67</td>
<td>25.34</td>
</tr>
<tr>
<td>M5</td>
<td>24.47</td>
<td>25.43</td>
<td>26.41</td>
<td>25.64</td>
<td>24.82</td>
<td>25.26</td>
</tr>
<tr>
<td>Mean</td>
<td>23.99</td>
<td>26.45</td>
<td>28.46</td>
<td>25.75</td>
<td>25.35</td>
<td>26.00</td>
</tr>
</tbody>
</table>

S.E. of M marginal mean = 8.4 tons/ac.
S.E. of F marginal mean = 10.8 tons/ac.
S.E. of body of table or control mean = 18.7 tons/ac.

Crop — Sugarcane.
Ref. — I.A.R.I. 54(33).
Type — 'MV'.

Object — To study the relative performance of some promising Sugarcane varieties in relation with different levels of N.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 10 and 12.3.1954. (iv) (a) 2 tractor ploughings, 1 desi ploughing, 4 beamings, dicing and planking. (b) to (e) N.A. (v) The field was green manured with sunhemp and additional F.Y.M. at 10 tons/ac. +80 lb/ac. of P2O5 as Super were added. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings and 1 earthing. (ix) N.A. (x) March, April 1955.

2. TREATMENTS:
Main-plot treatments:
Sub-plot treatments:
4 levels of N as A/S: N0 = 0, N1 = 40, N2 = 80 and N3 = 120 lb/ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 52.5'x20'. (b) 21.5'. (v) Yes.
4. GENERAL:

(i) Normal. (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1950—contd. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 28.83 tons/ac. (ii) (a) 5.99 tons/ac. (b) 2.07 tons/ac. (iii) Main effect of N and V are significant. (iv) Av. yield of sugarcane in tons/ac:

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
<th>V₆</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>25.96</td>
<td>21.60</td>
<td>28.11</td>
<td>24.90</td>
<td>26.68</td>
<td>27.54</td>
<td>27.47</td>
</tr>
<tr>
<td>N₁</td>
<td>26.95</td>
<td>35.36</td>
<td>27.95</td>
<td>25.17</td>
<td>31.39</td>
<td>27.44</td>
<td>29.04</td>
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<tr>
<td>N₂</td>
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<td>29.11</td>
<td>24.60</td>
<td>32.79</td>
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<td>28.59</td>
<td>23.90</td>
<td>31.77</td>
<td>30.93</td>
<td>28.97</td>
</tr>
<tr>
<td>Mean</td>
<td>26.36</td>
<td>33.77</td>
<td>28.44</td>
<td>26.64</td>
<td>30.66</td>
<td>29.11</td>
<td>28.83</td>
</tr>
</tbody>
</table>

S.E. of difference of two:

1. V marginal means = 2.46 tons/ac.
2. N marginal means = 0.69 tons/ac.
3. N means at the same level of V = 1.68 tons/ac.
4. V means at the same level of N = 2.85 tons/ac.

Crop :- Sugarcane.
Ref :- I.A.R.I. 56(33).
Type :- 'MV'.

Object :— To study the effect of N on different varieties of Sugarcane.

1. BASAL CONDITIONS:

(i) (a) N A. (b) Sannhemp. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 2 and 3.3.1956. (iv) (a) Tractor discing, grubbing and country ploughing. (b) to (e) N.A. (v) G.M. with sannhemp. (vi) As per treatments. (vii) Irrigated. (viii) Hoeing and earthing. (ix) 22.28". (x) 17.2.1957 to 3.4.1957.

2. TREATMENTS:

Same as in expl. no. 54(33) on page 420.

3. DESIGN:

(i) Split-plot. (ii) (a) 6 main-plots/blo ck and 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 60' x 17.5'. (b) 60' x 12.5'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Growth, no. of clumps, weight of clump, juice analysis for sucrose. (iv) (a) 1950—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Tables of means are N.A.

5. RESULTS:

(i) 26.78 tons/ac. (ii) (a) 3.28 tons/ac. (b) 1.91 tons/ac. (iii) Main effects of V and N are highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
<th>V₆</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>23.61</td>
<td>30.77</td>
<td>27.37</td>
<td>24.90</td>
<td>28.68</td>
<td>25.34</td>
<td>23.80</td>
<td>26.34</td>
<td>27.80</td>
<td>29.18</td>
</tr>
</tbody>
</table>

S.E. of V marginal mean = 0.95 tons/ac.
S.E. of N marginal mean = 0.45 tons/ac.
Crop :- Sugarcane.  
Object :- To study the response of different varieties of Sugarcane to Nitrogen.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 10 and 11.2.1958. (iv) (a) 1 double discing, 2 double grubbing and beamng with sohaga. (b) Planting of 3 budded setts. (c) to (e) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 3 weedings and 3 hoeings. (ix) N.A. (x) 19.1.1959 to mid. February, 1959.

2. TREATMENTS:
Same as in expt. no. 57(39) above.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/coplication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 40' X 15', (b) 36' X 10'. (v) 1' X 2.5'. (vi) Yes.
4. GENERAL:
(i) Normal. Lodging from 21 to 29.9.1958 due to strong gales of wind whose velocity was 64 to 66 m.p.h.
(ii) Slight attack of shoot borer was controlled by spraying BHC 5%. (iii) Cane yield. (iv) (a) to (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 27.52 tons/ac. (ii) (a) 5.16 tons/ac. (b) 2.59 tons/ac. (iii) Main effect of V and N alone are highly significant. (iv) Av. yield of stripped cane in tons/ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>27.41</td>
<td>28.15</td>
<td>27.11</td>
<td>31.61</td>
<td>25.72</td>
<td>22.85</td>
</tr>
<tr>
<td>N2</td>
<td>28.47</td>
<td>29.95</td>
<td>28.19</td>
<td>32.85</td>
<td>25.73</td>
<td>25.99</td>
</tr>
<tr>
<td>N3</td>
<td>29.64</td>
<td>30.03</td>
<td>29.79</td>
<td>33.15</td>
<td>26.94</td>
<td>25.86</td>
</tr>
<tr>
<td>Mean</td>
<td>28.16</td>
<td>29.36</td>
<td>27.40</td>
<td>32.26</td>
<td>25.95</td>
<td>23.95</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. V marginal means = 1.52 tons/ac.
2. N marginal means = 0.86 tons/ac.
3. N means at the same level of V = 2.11 tons/ac.
4. V means at the same level of N = 2.81 tons/ac.

Crop: Sugarcane.
Type: MV.

Ref: I.A.R.I. 59(33).

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 18 and 19.2.1959. (iv) (a) 2 double discings, 1 double grubbing, levelling and beam ng. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Hoeings, 2 weedings and 1 earthing. (ix) N.A. (x) 25.12.1959 to 11.1.1960.

2. TREATMENTS:
Same as in exp. no. 57(39) on page 422.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/replication 4 sub-plots/min-plot. (b) N.A. (iii) f. (iv) (a) 40' x 15', (b) 38' x 10', (v) 1.0' x 2.5'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Cane yield. (iv) (a) 1957-1959. (b) Nil. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 22.76 tons/ac. (ii) (a) 3.02 tons/ac. (b) 1.79 tons/ac. (iii) Main effects of N and V are highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>19.67</td>
<td>23.39</td>
<td>25.72</td>
<td>23.77</td>
<td>21.61</td>
<td>18.40</td>
</tr>
<tr>
<td>N2</td>
<td>19.50</td>
<td>25.39</td>
<td>25.59</td>
<td>26.22</td>
<td>23.77</td>
<td>19.85</td>
</tr>
<tr>
<td>N3</td>
<td>22.74</td>
<td>26.26</td>
<td>29.17</td>
<td>27.44</td>
<td>27.32</td>
<td>21.34</td>
</tr>
<tr>
<td>Mean</td>
<td>19.68</td>
<td>23.81</td>
<td>25.78</td>
<td>25.39</td>
<td>23.09</td>
<td>18.83</td>
</tr>
</tbody>
</table>
Object:—To study the relative performance of Sugarcane varieties at different levels of N.

1. BASAL CONDITIONS :
(i) and (ii) N.A. (iii) Victory plough, 3 desi plough and 2 beamings. (b) In furrows 2½ apart. (c) 50 mds./ac. (d) and (e) N.A. (v) As per treatments. (vi) Irrigated. (vii) 2 weedings and 1 earthing. (ix) Nil. (x) April 1959.

2. TREATMENTS :
Main-plot treatments:
6 varieties: V₁ = C0.-1104, V₂ = C0.-1116, V₃ = C0.-1124, V₄ = C0.-1136, V₅ = C0.-1142 and V₆ = C0.-997.
Sub-plot treatments:
2 levels of N as A/S: N₁ = 60 and N₂ = 120 lb./ac.

3. DESIGN :
(i) Split-plot. (ii) 6 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 22' X 7.5'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Yield of sugarcane. (iv) and (v) No. (vi) and (vii) Nil.

5. RESULTS :
(i) 25.39 tons/ac. (ii) (a) 7.85 tons/ac. (b) 2.47 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
<th>V₆</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₂</td>
<td>28.93</td>
<td>23.31</td>
<td>21.80</td>
<td>26.90</td>
<td>29.19</td>
<td>25.28</td>
<td>26.00</td>
</tr>
<tr>
<td>Mean</td>
<td>27.92</td>
<td>22.61</td>
<td>21.63</td>
<td>25.58</td>
<td>29.01</td>
<td>26.60</td>
<td>25.39</td>
</tr>
</tbody>
</table>

S.E. of difference of two
2. N marginal means = 0.71 tons/ac.
3. N marginal means at the same level of V = 1.75 tons/ac.
4. V marginal means at the same level of N = 4.11 tons/ac.

Object:—To study the effect of variation in the depth of cultivation, levels of N and irrigation intervals on the yield and quality of Sugarcane.
1. **BASAL CONDITIONS:**
   (i) and (ii) N.A. (iii) 12 to 14.1.1955. (iv) to (ix) As per treatments. (b) to (e) N.A. (v) Nil. (vi) CO.—647. (vii) Irrigated. (viii) Weedng. (ix) 3 to 29.3.1956.

2. **TREATMENTS:**
   
   **Main-plot treatments:**
   - 3 cultural treatments: 
     - C_3 = Ploughing with desi plough (non-inversion)
     - C_1 = Ploughing with desi plough + tractor plough (inversion) 6' deep + discing + grubbing
     - C_2 = Ploughing with tractor (inversion) 10' deep + discing + grubbing.
   
   **Sub-plot treatments:**
   All combinations of (1) and (2)
   - (1) 3 levels of N as A/S: N_1 = 80, N_2 = 120 and N_3 = 160 lb/ac.
   - (2) 3 intervals of irrigation: I_1 = 10, I_2 = 15 and I_3 = 20 days.

3. **DESIGN:**
   (i) Split-plot. (ii) 3 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 19' x 12 3'. (vi) Nil. (vi) Yes.

4. **GENERAL:**
   (i) Growth rate low. (ii) Attack of shoot borer in July and August. (iii) Yield of sugarcane. (iv) and (v) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 26.94 tons/ac. (ii) (a) 9.75 tons/ac. (b) 3.17 tons/ac. (iii) Only C X N interaction is highly significant. (iv) Av. yield of sugarcane in tons/ac:

<table>
<thead>
<tr>
<th>N_1</th>
<th>N_2</th>
<th>N_3</th>
<th>Mean</th>
<th>I_1</th>
<th>I_2</th>
<th>I_3</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_3</td>
<td>27.82</td>
<td>26.68</td>
<td>26.59</td>
<td>27.03</td>
<td>25.94</td>
<td>26.73</td>
</tr>
<tr>
<td>C_1</td>
<td>24.74</td>
<td>27.07</td>
<td>24.29</td>
<td>25.37</td>
<td>24.93</td>
<td>25.00</td>
</tr>
<tr>
<td>C_2</td>
<td>29.43</td>
<td>25.70</td>
<td>30.14</td>
<td>28.42</td>
<td>28.68</td>
<td>27.84</td>
</tr>
<tr>
<td>Mean</td>
<td>27.33</td>
<td>26.48</td>
<td>27.01</td>
<td>26.94</td>
<td>26.52</td>
<td>26.82</td>
</tr>
<tr>
<td>I_1</td>
<td>26.95</td>
<td>25.77</td>
<td>26.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I_2</td>
<td>26.77</td>
<td>27.03</td>
<td>26.66</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I_3</td>
<td>28.28</td>
<td>26.65</td>
<td>27.52</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

M.E. of difference of two

1. C marginal means = 2.30 tons/ac.
2. N or I marginal means = 0.75 tons/ac.
3. N or I means at the same level of C = 1.29 tons/ac.
4. C means at the same level of N or I = 2.53 tons/ac.

S.E. of body of N X I table = 0.92 tons/ac.

**Crop:** Sugarcane.  
**Site:** Indian Agri. Res. Instt., New Delhi.  
**Type:** 'ICM'.

Object:— To study the effect in the variation of depths of cultivation with nitrogen and irrigation levels on the yield of Sugarcane.

1. **BASAL CONDITIONS:**
   (i) (a) N.A. (b) Fallow. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 21 and 24.3.1956. (iv) (a) As per treatments. (b) to (e) N.A. (v) F.Y.M. at 110 tons/ac. (vi) CO.—647 (medium). (vii) Irrigated. (viii) Weedng, hoeing and earthing. (ix) 22.28'. (a) 11.12.1956 to 12.2.1957.

2. **TREATMENTS:**
   Same as in exp. no 55(33) on page 424.
3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 49' x 17.5'.
(b) 49' x 12.5'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1953—contd. (b) No. (c) Nil. (v) (a) and (b) N.A.
(vi) Nil. (vii) Two-way tables of N.A.

5. RESULTS:
(i) 26.79 tons/ac. (ii) (a) 1.86 tons/ac. (b) 1.57 tons/ac. (iii) None of the effects is significant. (iv) Av.
yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₀</th>
<th>C₁</th>
<th>C₂</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E. of C marginal mean</td>
<td>= 0.31 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E. of N or I marginal mean</td>
<td>= 0.26 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop:** Sugarcane.  
**Site:** Indian Agri. Res. Instt., New Delhi.  
**Type:** 'ICM'.

Object: To study the effect of variation in depths of cultivation with alternative tillage implements in combination with various levels of N and irrigation.

1. BASAL CONDITIONS:
(i) and (vi) N.A. (ii) 13 to 15.3.1957. (iii) 9 ploughings with desi plough, 2 tractor ploughings, planking,
dicing, harrowing and grubbing. (b) In furrows of seed by ridge plough. (c) 60 mds./ac. (d) and (e) N.A. (v) N.A. (vi) CO—647. (vii) Irrigated. (viii) Hoeings and 2 weedings. (ix) N.A. (x) 14.2.1958 to mid. of March, 1958.

2. TREATMENTS:
Main-plot treatments:
3 depths of cultivation: C₀ = 4" with desi plough (non-inversion), C₁ = 6" with tractor plough (inversion) and C₂ = 10" with tractor plough (inversion).

Sub-plot treatments:
All combinations of (1) and (2)
(1) 3 levels of N as A/S: N₁ = 80, N₂ = 120 and N₃ = 160 lb/ac.  
(2) 3 irrigation intervals: I₁ = 10, I₂ = 15 and I₃ = 20 days.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 45' x 17.5'.
(b) 44' x 12.5'. (v) 2.5' x 2.5'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of minor borer. (iii) Sugarcane yield. (iv) to (vii) N.A.

5. RESULTS:
(i) 26.42 tons/ac. (ii) (a) 2.10 tons/ac. (b) 2.16 tons/ac. (iii) Main effects of N and I are highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>C₀</th>
<th>C₁</th>
<th>C₂</th>
<th>Mean</th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
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<tbody>
<tr>
<td>N₂</td>
<td>26.59</td>
<td>27.12</td>
<td>27.63</td>
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<td>28.23</td>
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<td>N₃</td>
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<td>27.58</td>
<td>27.86</td>
<td>27.24</td>
<td>28.50</td>
<td>28.40</td>
</tr>
<tr>
<td>Mean</td>
<td>25.76</td>
<td>26.56</td>
<td>26.93</td>
<td>26.42</td>
<td>27.56</td>
<td>26.89</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.19</td>
<td>27.54</td>
<td>27.96</td>
</tr>
<tr>
<td>26.38</td>
<td>27.13</td>
<td>27.16</td>
</tr>
<tr>
<td>23.70</td>
<td>25.02</td>
<td>25.68</td>
</tr>
</tbody>
</table>
Crop : Sugarcane.


Object : To study the effect of irrigation levels, nitrogen levels and seed rates on Sugarcane.

1. BASAL CONDITIONS :
(i) and (ii) N.A. (iii) 19 and 20.3.1957. (iv) 6 desi ploughings and 3 tripilings. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) and (vi) N.A. (vi) Irrigated. (vii) Horse hoeing. (x) December, 1957.

2. TREATMENTS :
All combinations of (1) (2) and (3)
(1) 3 intensities of irrigation : 11 = 45°, 12 = 60° and 13 = 75° delta of irrigation.
(2) 3 levels of N as A/S : N1 = 60, N2 = 80 and N3 = 120 lb/ac.
(3) 3 seed rates : S1 = 4, S2 = 60 and S3 = 75 mds/ac.
28°, 38° and 48° water was given with 45°, 60° and 75° delta of irrigation.

3. DESIGN :
(i) 3° partial confd. (ii) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) N.A. 18'x40'. (vi) Nil. (vi) Yes.

4. GENERAL :
(i) Good. (ii) Attack of top borer. (iii) Sugarcane yield. (iv) (a) to (c) N.A. (v) (a) and (b) Nil. (vi) Hails storm at sowing time. (vii) Nil.

5. RESULTS :
(i) 16.39 tons/ac. (ii) 1.40 tons/ac. (iii) Interactions 1 x S and N x S are significant. (iv) Av. yield of Sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>I1</th>
<th>I2</th>
<th>I3</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>15.85</td>
<td>15.83</td>
<td>16.77</td>
<td>16.15</td>
<td>16.34</td>
<td>15.76</td>
</tr>
<tr>
<td>N2</td>
<td>15.49</td>
<td>16.89</td>
<td>17.63</td>
<td>16.67</td>
<td>17.13</td>
<td>17.04</td>
</tr>
<tr>
<td>N3</td>
<td>17.00</td>
<td>16.44</td>
<td>15.59</td>
<td>16.34</td>
<td>15.72</td>
<td>16.70</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.23 tons/ac.
S.E. of body of any table = 0.33 tons/ac.

Crop : Sugarcane.


Type : 'D'.

Object : To study the effect of 2, 4 - D alone and in combination with cultural practices in controlling weeds in Sugarcane.
1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 24.3.1956. (iv) (a) to (e) N.A. (v) F.Y.M. was broadcast at 12 tons/ha about 13 months before sowing and mixed thoroughly with soil. (vi) CO.—647. (vii) Irrigated. (viii) N.A. (ix) 22.29”. (x) 2.4.1957 to 16.4.1957.

2. **TREATMENTS**:
   9 weedidal treatments: \( W_0 = \text{Unweeded (control)} \), \( W_1 = \text{Local method of weeding (3 hoeings with cultivator)} \), \( W_2 = \text{Pre-emergence application of 2,4-D at 2 lb./ac.} \), \( W_3 = \text{Post emergence application of 2,4-D at 2 lb./ac. (twice)} \), \( W_4 = \text{Post emergence application of 2,4-D at 2 lb./ac. (once)} \), \( W_5 = W_1 + W_2 \), \( W_6 = W_1 + W_3 \), \( W_7 = W_1 + W_4 \), \( W_8 = W_1 + W_5 + W_6 \).

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 33’x20’. (b) 25’x16’. (v) 4.0’x2.0’. (vi) Yes.

4. **GENERAL**:
   (i) Normal. (ii) Crop was seriously damaged by top shoot borer in the early stages. Dead hearts were pulled by hand. (iii) Height of cane, no. of canes, juice analysis and total yield of cane. (iv) (a) 1956—1957. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS**:
   (i) 28.68 tons/ha. (ii) 2.64 tons/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ha.

### Treatment Values

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( W_0 )</th>
<th>( W_1 )</th>
<th>( W_2 )</th>
<th>( W_3 )</th>
<th>( W_4 )</th>
<th>( W_5 )</th>
<th>( W_6 )</th>
<th>( W_7 )</th>
<th>( W_8 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>23.33</td>
<td>30.38</td>
<td>27.11</td>
<td>27.29</td>
<td>26.89</td>
<td>28.47</td>
<td>32.03</td>
<td>30.05</td>
<td>32.55</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
<td>1.32</td>
</tr>
</tbody>
</table>

**Crop**: Sugarcane.  
**Site**: Indian Agri. Res. Instit., New Delhi.  
**Object**: To study the effect of 2,4-D alone and in conjunction with cultural practices in controlling weeds in Sugarcane.
Object: To study the effect of 2, 4-D alone and in combination with cultural practices in controlling weeds in Sugarcane.

1. BASAL CONDITIONS:
   (i) to (vii) N.A. (viii) Irrigated. (ix) to (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 58(53) on page 427.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9, (b) N.A. (iii) 4. (iv) (a) 15' x 35'. (b) 10' x 30'. (v) 24' x 24'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of cane. (iv) (a) N.A. (b) Yes. (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 30.86 tons/acre. (ii) 2.89 tons/acre. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W4</th>
<th>W5</th>
<th>W6</th>
<th>W7</th>
<th>W8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>21.16</td>
<td>33.58</td>
<td>26.13</td>
<td>30.14</td>
<td>29.96</td>
<td>30.42</td>
<td>34.55</td>
<td>32.53</td>
</tr>
</tbody>
</table>

   S.E./mean = 1.45 tons/acre
Crop - Sugarcane.


Ref - I.A.R.I. 57(43).

Type = 'D'.

Object - To study the effect of four formulations of weedicides in controlling weeds in Sugarcane.

1. BASAL CONDITIONS:
   (i) to (a) N.A.

2. TREATMENTS and 3. DESIGN:
   Same as in expil. no. 56(36) on page 429.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Cane yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 26.31 tons/ac. (ii) (a) 2.87 tons/ac. (b) 1.91 tons/ac. (iii) None]of the effects is significant. (iv) Av.
   yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>28.48</td>
<td>27.14</td>
<td>26.30</td>
<td>25.21</td>
<td>26.78</td>
</tr>
<tr>
<td>D2</td>
<td>25.45</td>
<td>24.95</td>
<td>26.62</td>
<td>26.66</td>
<td>25.92</td>
</tr>
<tr>
<td>D3</td>
<td>24.92</td>
<td>27.95</td>
<td>26.15</td>
<td>25.83</td>
<td>26.22</td>
</tr>
<tr>
<td>D4</td>
<td>26.89</td>
<td>26.37</td>
<td>26.03</td>
<td>25.96</td>
<td>26.31</td>
</tr>
<tr>
<td>Mean</td>
<td>26.44</td>
<td>26.60</td>
<td>26.27</td>
<td>25.92</td>
<td>26.31</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. W marginal means = 1.01 tons/ac.
2. D marginal means = 0.67 tons/ac.
3. D means at the same level of W = 1.35 tons/ac.
4. W means at the same level of D = 1.55 tons/ac.

Crop - Sugarcane.


Ref - I.A.R.I. 59(34).

Type = 'D'.

Object - To find out a suitable weed control programme in Sugarcane using chemicals and cultural methods.

1. BASAL CONDITIONS :
   (i) and (ii) N.A. (iii) 16.3.1959. (iv) (a) 1 desl ploughing. 1 Victory ploughing, 2 grubings and 2 discings
   by tractor. (b) to (e) N.A. (v) 120 lb./ac. of N+60 lb./ac. of P2O5. (vi) N.A. (vii) Irrigated. (viii) As
   per treatments. (ix) N.A. (x) 2nd week of March, 1960.

2. TREATMENTS:
   All combinations of (1) and (2)+(5 extra treatments
   (1) 4 weedicides at pre emergence stage: W4=Nit, W4=1 hand weeding, W4=10 lb. of TCA+1 lb. of
   2, 4—D, W4=Crag 1+1/2 lb. of 2, 4—D.
   (2) 4 weedicides at post emergence stage: X4=4 lb. of Crag 1+1/2 lb. of 2, 4—D, X4=4 lb. of TCA+
   1/2 lb. of 2, 4—D, X4=2 lb. of CMU+2 lb. of 2, 4—D, and
   X4=2 hoings.

Extra treatments: E0=Control, E1=Regular hand weeding, E2=3 hoings (local method), E3=3 hand
weedicides and E4=3 hand weedings+3 hoings.

3. DESIGN :
   (i) R.B.D. (ii) (a) 21. (b) N.A. (iii) 4. (iv) (a) 20'X30'. (b) 300 sq. ft. (v) N.A. (vi) Yes.
4. GENERAL:
(i) N.A. (ii) Attack of top-borer. (iii) Canolyield. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 21.50 tons/ac. (ii) 1.71 tons/ac. (iii) Main effects of W and X are highly significant. Interaction \( W \times X \) is significant. 'E v others' and E effects are highly significant. (iv) Av. yield of sugarcane in tons/ac.

\[
E_9 = 7.41, \quad E_3 = 36.24, \quad E_6 = 17.27, \quad E_a = 26.18 \quad \text{and} \quad E_x = 26.78 \quad \text{tons/ac.}
\]

<table>
<thead>
<tr>
<th>( X_1 )</th>
<th>( X_2 )</th>
<th>( X_3 )</th>
<th>( X_4 )</th>
<th>( \text{Mean} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( W_9 )</td>
<td>11.02</td>
<td>10.26</td>
<td>21.25</td>
<td>14.03</td>
</tr>
<tr>
<td>( W_x )</td>
<td>13.00</td>
<td>11.12</td>
<td>22.09</td>
<td>15.04</td>
</tr>
<tr>
<td>( W_6 )</td>
<td>24.53</td>
<td>25.49</td>
<td>29.46</td>
<td>26.13</td>
</tr>
<tr>
<td>( W_x )</td>
<td>26.45</td>
<td>25.36</td>
<td>32.40</td>
<td>29.30</td>
</tr>
</tbody>
</table>

Mean \( = 18.75 \), \( = 18.21 \), \( = 26.30 \), \( = 21.12 \), \( = 21.10 \)

S.E. of W or X marginal mean \( = 0.43 \) tons/ac.
S.E. of body of table or E mean \( = 0.86 \) tons/ac.

Crop: Sugarcane.
Ref: I.A.R.I. 54(34).
Type: 'DM'.

Object: To test the relative efficiency of different forms of N with some weed control measures.

I. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 11 and 12,3,1954. (iv) (a) 4 ploughings and 1 discing. (b) to (c) N.A. (v) 10 tons/ac. of F.Y.M.+80 lb./ac. of \( P_2O_5+N \) (dose N.A.). (vi) \( CO_2=312 \). (vii) Irrigated. (vi) 2 blind hoeings, 3 hoeing and 1 weeding. (ix) N.A. (x) 10.2.1955 to 6.4.1955.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 sources of N: \( S_1=A/S, S_2=C/N \) and \( S_3=\text{Cal. Nitrate.} \)
(2) 3 levels of N: \( N_1=40, N_2=80 \) and \( N_3=120 \) lb./ac.
(3) 3 methods of weed control: \( W_1=\text{Mechanical}, W_2=\text{Dicotox (2, 4-D) at 5 lb./ac. and } W_3=C/S \) at 15 lb./ac.

N applied on 31.3.1954.

3. DESIGN:
(i) 3³ confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/60.5 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of cane. (iv) (a) 1952—1954. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 20.18 tons/ac. (ii) 2.50 tons/ac. (iii) Main effect of W alone is highly significant. (iv) Av. yield of sugarcane in tons/ac.
Crop: Cotton (Kharif).

Object: To determine the optimum dose of N and P and the most efficient method of applying the same on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 2.5.1957. (iv) (a) Ploughing with Victory plough and 2 rollings. (b) N.A. (c) 20 lb./ac. (d) and (e) N.A. (y) and (vi) N.A. (vii) Irrigated. (viii) 2 weedings. (x) N.A. (x) 16 to 19.10.1957 and 15 to 18.12.1957.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 methods of application: M_1 = Broadcast, M_2 = Fertilizer placed 3" under seed and M_3 = Fertilizer placed 4" to either side of seed and 4" below seed level.
   (2) 3 levels of N as A/S: N_1 = 40, N_2 = 80 and N_3 = 120 lb./ac.
   (3) 3 levels of P_2O_5: P_0 = 0, P_1 = 40 and P_2 = 80 lb./ac.

3. DESIGN:
   (i) 3^3 partially confd. (MNP^2 and MN^2P are confd.) (ii) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 50' x 17'. (b) 40' x 12.5'. (v) 5' x 2.25'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Attack of jassids. (iii) Yield of kapas. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1282 lb./ac. (ii) 119.2 lb./ac. (iii) Interaction N x P alone is significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>N_1</th>
<th>N_2</th>
<th>N_3</th>
<th>Mean</th>
<th>W_1</th>
<th>W_2</th>
<th>W_3</th>
</tr>
</thead>
<tbody>
<tr>
<td>S_1</td>
<td>19.01</td>
<td>19.66</td>
<td>20.30</td>
<td>19.66</td>
<td>22.34</td>
<td>19.21</td>
</tr>
<tr>
<td>S_2</td>
<td>20.03</td>
<td>21.02</td>
<td>21.75</td>
<td>20.93</td>
<td>24.99</td>
<td>17.89</td>
</tr>
<tr>
<td>S_3</td>
<td>18.35</td>
<td>19.79</td>
<td>21.70</td>
<td>19.95</td>
<td>21.76</td>
<td>18.32</td>
</tr>
<tr>
<td>Mean</td>
<td>19.13</td>
<td>20.16</td>
<td>21.25</td>
<td>20.18</td>
<td>23.03</td>
<td>18.64</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.59 ton/ac.
S.E. of body of any table = 1.02 ton/ac.

\[
\text{Mean:N, N, Ns ~ 19.01 19.66 20.30} \\
\text{Mean:W, W, W ~ 19.95 21.76 18.32 19.26} \\
\text{Mean:W, W, W ~ 20.18 23.03 18.64 18.87} \\
\]

Ref: I.A.R.I. 57(44).
Type: 'M'.

Object: To determine the optimum dose of N and P and the most efficient method of applying the same on the yield of Cotton.
Object: To study the effect of different methods of application of N and P on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 18.5.1958. Resown on 25.5.1958. (iv) (a) 2 ploughings with Victory plough, 1 double discing and grubbing twice, *triphali* and double soling. (b) to (e) N.A. (v) F.—216. (vi) Irrigated. (vii) 2 weedings and 2 hoeings. (ix) N.A. (x) 18 to 20.10.1958, 3 to 9.11.1958 and 4 to 11.12.1958.

2. TREATMENTS:
   All combinations of (1), (2) and (3) + 3 extra treatments in each block.
   (1) 3 levels of N: N₁ = 20, N₂ = 40 and N₃ = 60 lb./ac.
   (2) 3 levels of P₂O₅: P₁ = 15, P₂ = 30 and P₃ = 45 lb./ac.
   (3) 3 methods of application: M₁ = Soil application, M₂ = Half applied to soil + half sprayed and M₃ = Spray application.
   Extra treatments: E₁ = Control, E₂ = 80 lb./ac. of N + 45 lb./ac. of P₂O₅ as soil application and E₃ = 100 lb./ac. of N + 45 lb./ac. of P₂O₅ as soil application.

3. DESIGN:
   (i) 33 confd with 3 extra treatments/block (NP₂M₁, NP₂M₂ and NP₁M₂ are confd.). (ii) (a) 12 plots/block and 3 blocks/repetition. (b) N.A. (iii) 2. (iv) (a) 27' x 24'3", (b) 25' x 17'6", (v) 1' x 3'41". (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of kapas. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 651 lb./ac. (ii) 166.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of kapas in lb./ac.
   \[ E₃ = \text{665 lb./ac.}, \quad E₁ = \text{781 lb./ac.} \quad \text{and} \quad E₂ = \text{639 lb./ac.} \]

<table>
<thead>
<tr>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₁</td>
<td>561</td>
<td>671</td>
<td>672</td>
<td>635</td>
<td>621</td>
<td>647</td>
</tr>
<tr>
<td>P₂</td>
<td>697</td>
<td>661</td>
<td>686</td>
<td>681</td>
<td>635</td>
<td>620</td>
</tr>
<tr>
<td>P₃</td>
<td>746</td>
<td>537</td>
<td>531</td>
<td>592</td>
<td>678</td>
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<tr>
<td>Mean</td>
<td>668</td>
<td>623</td>
<td>630</td>
<td>636</td>
<td>645</td>
<td>602</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 39.2 lb./ac.
S.E. of body of any table or E mean = 67.9 lb./ac.

Object: To compare the response of Cotton to the application of Urea and triple Superphosphate applied as solid fertilizer to soil, sprayed on foliage and the combination of the two.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 22 and 23.5.1959. (iv) (a) 1 Victory ploughing, 1 ploughing with *triphali* and plantings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 hand weeding, 1 weeding with *Krushi*, 1 horse hoeing and 1 thinning. (ix) N.A. (x) 25.9.1959 to 24.10.1959.
2. TREATMENTS:

All combinations (1), (2) and (3)+3 extra treatments in each block.
(1) 3 levels of N: N₁=20, N₂=40 and N₃=60 lb/ac.
(2) 3 levels of P₂O₅: P₁=15, P₂=30 and P₃=45 lb/ac.
(3) 3 methods of application: M₁=Full dose applied to the soil M₄=Half dose through soil and half sprayed on foliage and M₅=Full dose applied on foliage.

Extra treatments: E₀=Control, E₁=80 lb/ac. of N+40 lb/ac. of P₂O₅ applied through soil and E₂=100 lb/ac. of N+45 lb/ac. of P₂O₅ applied through soil.

N applied as Urea and P₂O₅ as triple Super.

3. DESIGN:

(i) 3 partially confd. with three extra treatments (NPM₂ and NP₂M are confd.).
(ii) 12 plots/block and 3 blocks/replication.

4. GENERAL:

(i) Good. (ii) Boll worm attack. Endrex was sprayed. (iii) Yield of kapas.

5. RESULTS:

E₀ = 1340 lb/ac., E₁ = 971 lb/ac. and E₂ = 830 lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
<th>M₁</th>
<th>M₄</th>
<th>M₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₁</td>
<td>1031</td>
<td>1026</td>
<td>931</td>
<td>936</td>
<td>919</td>
<td>1044</td>
<td>1026</td>
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<tr>
<td>P₂</td>
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<td>896</td>
<td>973</td>
<td>924</td>
<td>927</td>
<td>884</td>
<td>960</td>
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<td>P₃</td>
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<td>1018</td>
<td>944</td>
<td>983</td>
<td>899</td>
<td>971</td>
<td>1079</td>
</tr>
<tr>
<td>Mean</td>
<td>973</td>
<td>980</td>
<td>949</td>
<td>968</td>
<td>915</td>
<td>966</td>
<td>1022</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 48.3 lb/ac.
S.E. of body of any table or E mean = 83.6 lb/ac.

Crop :- Cotton (Kharif).


Object :- To determine the relative efficiency of methods of applying different levels of N alone and with P.

1. BASAL CONDITIONS:

(i) and (ii) N.A. (iii) 20.5.1958. Renown on 27.5.1958. (iv) (a) 1 tractor ploughing, 1 discing, 1 ploughing with Victory plough and 1 ploughing with desi plough (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 2 weedings and 1 interculture. (ix) N.A. (x) 16 to 22.10.1958 and 13 to 16.11.1958.

2. TREATMENTS:

Main-plot treatments:
4 doses of fertilizers: F₁=20 lb/ac. of N as A/S, F₂=40 lb/ac. of N as A/S, F₃=60 lb/ac. of N as A/S and F₄=F₂+F₃=60 lb/ac. of P₂O₅ as Super.

Sub-plot treatments:
3 methods of application: M₁=Broadcast, M₂=Placed 3" below seed and M₃=Placed 4" to either side of seed and 4" below the seed level.

Ref:- I.A.R.I. 58(45).

Type :- 'M'.
3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replcation and 3 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 50' x 14.5'. (b) 43.3' x 14'. (v) 33' x 33'. (vi) Yes.

4. GENERAL:
(i) First sown crop failed because of hot and gusty winds. The re-sown crop put on normal growth in early stages but was ruined later by pest and rain. (ii) Severe attack of jassid and chafer beetle. (iii) Yield of kapas. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 73 lb./ac. (ii) 93.0 lb./ac. (b) 101.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
<th></th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
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<td>350</td>
<td>384</td>
<td>390</td>
<td>373</td>
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</table>

S.E. of difference of two
1. F marginal means = 34.7 lb./ac.
2. M marginal means = 32.2 lb./ac.
3. M means at the same level of F = 64.4 lb./ac.
4. F means at the same level of M = 62.9 lb./ac.

Crop : Cotton.
Type : 'M'.

Object : To study the uptake of P by Cotton.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 26 to 29.4.1959. (iv) (a) Double grubbing and double discing. (b) to (e) N.A. (v) 60 lb./ac. of N + 40 lb./ac. of K2O. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) N.A.

2. TREATMENTS:
All combinations of (1), 2 and (3) + 3 extra treatments/block.
(i) 3 levels of P2O5: P1 = 20, P2 = 40 and P3 = 60 lb./ac.
(ii) 3 types of single band placement: H0 = 0', H1 = 3' and H2 = 5' below surface.
(iii) 3 types of double band placement: M0 = 0', M1 = 3' and M2 = 5' below surface.

Extra treatments: E1 = 60 lb./ac. of N + 40 lb./ac. of K2O, E2 = 40 lb./ac. of P2O5 in single band 3' below surface and E3 = 40 lb./ac. of P2O5 in double band 3' below surface.
P2O5 applied in the form of Super.

3. DESIGN:
(i) 3' partially confd. with 3 extra treatments per block. (PHM2 and PHM were confd 1. (ii) (a) 12 plots/block; 3 blocks/replcation. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 18' x 20'. (v) N.A. (v) Yes.

4. GENERAL:
(i) Good. (ii) Attack of jassids. (iii) Yield of kapas. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 961 lb./ac. (ii) 171.4 lb./ac. (iii) Interaction PHM alone is significant. (iv) Av. yield of kapas in lb./ac.
Object :- To study the effect in the variation of depths of cultivation with and without inversion on the yield of Cotton.

1. BASAL CONDITIONS :

2. TREATMENTS:
   Main plot treatments:
   3 types of ploughing: T 1 = Tractor ploughing 10" deep followed by grubbing and discing, T 2 = Victory ploughing followed by county plough, and T 3 = Country plough.

   Sub-plot treatments:
   2 methods of application: M 1 = Broadcast and M 2 = Placement.

   Sub-sub-plot treatments:
   4 manurial treatments: N 1 = 40 lb./ac. of N as A/S, N 2 = 40 lb./ac. of N as G.N.C., N 3 = 40 lb./ac. of N as A/S+80 lb./ac. of P 2 O 5 and N 4 = 40 lb./ac. of G.N.C.+80 lb./ac. of P 2 O 5.

3. DESIGN:
   (i) Split-plot. (ii) 3 main-plots/replication; 2 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) N.A. (iii) S. (iv) (a) 36"x15.5". (b) 36"x13.5". (v) Y x Y. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) N.A. (iii) Yield of kapas. (iv)(a) 1932—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (i) Nil. (vii) Two way tables: N.A.

5. RESULTS:
   (i) 367 lb./ac. (ii) 124.9 lb./ac. (b) 114.7 lb./ac. (c) 133.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T 1</th>
<th>T 2</th>
<th>T 3</th>
<th>M 1</th>
<th>N 1</th>
<th>N 2</th>
<th>N 3</th>
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<td>402</td>
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S.E. of T mean = 19.7 lb./ac.
S.E. of M mean = 14.8 lb./ac.
S.E. of N mean = 30.0 lb./ac.
Crop :- Cotton.

Object :- To study the effect of depths of cultivation, different forms of nitrogen in combination with phosphate and their method of application on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) and (b) N.A. (iii) 1.6.1954. (iv) (a) As per treatments. (b) Sown in lines. (c) to (e) N.A. (vi) Nil. (vii) to (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 types of ploughing : T1 = 9 to 10" deep ploughing by tractor followed by grabber, T2 = 6" deep ploughing by Victory plough followed by country plough and T3 = 4" to 5" deep ploughing by country plough.

   Sub-plot treatments:
   2 methods of application: M1 = Broadcast and M2 = Placement.

   Sub-sub-plot treatments:
   All combinations of (i) and (ii)

3. DESIGN:
   (i) Split-plot. (ii) 3 main-plots/replication; 2 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) N.A.
   (iii) 5. (iv) (a) 30" X 21". (b) 27" X 18". (v) 1.5" X 1.5". (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of kapas, (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 133.2 lb./ac. (ii) (a) 343.5 lb./ac. (b) 243.4 lb./ac. (c) 230.7 lb./ac. (iii) None of the effects is significant. (iv) Ave. yield of kapar in lb./ac.

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S.E. of difference of two
1. T marginal means = 77.9 lb./ac. 6. M means at the same level of P or S = 59.9 lb./ac.
2. M marginal means = 44.4 lb./ac. 7. P or S means at the same level of M = 57.0 lb./ac.
3. S or P marginal means = 40.5 lb./ac. 8. P or S means at the same level of T = 69.8 lb./ac.
4. M means at the same level of T = 77.0 lb./ac. 9. T means at the same level of P or S = 92.2 lb./ac.
5. T means at the same level of M = 95.0 lb./ac. S.E. of body of P x S table = 40.3 lb./ac.
1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 9 and 10.5.1957. (iv) (a) As per treatments. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 hoeing by bullock hoe, 1 hand hoeing with Sharma hoe and 1 weeding with khyari (ix) N.A. (x) 27.9.1957, 11.10.1957, 25.10.1957 and 12.11.1957.

2. TREATMENTS:
Main-plot treatments:
3 types of ploughing: T1 = Deep ploughing 9" to 10" by tractor followed by grubber and disc, T2 = 5" to 6" ploughing by bullock soil turning Victory plough followed by country plough and T3 = 4" to 5" deep ploughing by country plough.

Sub-plot treatments:
2 methods of application: M1 = Placement of manures at plough hole and M2 = Broadcast of manures.

Sub-sub-plot treatments:
4 manurial treatments: N1 = 40 lb./ac. of N as ANS, N2 = 40 lb./ac. of N as G.N.C., N3 = N1 + 80 lb./ac. of P2O5 as Super and N4 = N2 + 80 lb./ac. of P2O5 as Super.

3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/replication ; 2 sub-plots/main-plot and 4 sub-sub-plot/sub-plot. (b) N.A. (iii) 5. (iv) (a) 38' x 15.5'. (b) 35' x 10.0'. (v) 1'6" x 2' x 9". (vi) Yes.

4. GENERAL:
(i) Very good. (ii) Attack of jassids, wilt and boll rots. 5% DDT was dusted. (iii) Yield of kapas. (i) (a) and (b) N.A. (c) Nil. (iv) to (vii) Nil.

5. RESULTS:
(i) 1793 lb./ac. (ii) (a) 149.8 lb./ac. (b) 139.4 lb./ac. (c) 130.9 lb./ac. (iii) Main effect o'M and interaction T x M are significant. (iv) Av. yield of kapas in lb./ac.

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<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
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<td>1820</td>
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<td>1778</td>
<td>1730</td>
<td>1973</td>
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S.E. of difference of two
1. T marginal means = 55.8 lb./ac. 5. T means at the same level of M = 64.0 lb./ac.
2. M marginal means = 25.4 lb./ac. 6. T means at the same level of N = 75.4 lb./ac.
3. N marginal means = 33.8 lb./ac. 7. N means at the same level of T = 58.5 lb./ac.
4. M means at the same level of T = 44.8 lb./ac. 8. M means at the same level of N = 48.6 lb./ac.
9. N means at the same level of M = 47.8 lb./ac.

Site = Ind. Agri. Res. Inst., New Delhi. Type = 'ICM'.
Object = To study the relationship of Irrigation, nitrogen levels and sowing dates on the yield of Cotton.

1. BASAL CONDITIONS:
(b) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) As per treatments. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 depths of irrigation: I1 = 20", I2 = 30" and I3 = 40".
(2) 3 levels of N as ANS: N1 = 20, N2 = 40 and N3 = 80 lb./ac.
(3) 3 dates of sowing: D1 = 1st May, D2 = 20th May and D3 = 10th June.
3. DESIGN:
(i) 3 plot confd. (D1N12 is totally confd.) (ii) 9 plots/block ; 3 blocks/replication. (b) N.A. (c) 3. (iv) 16 × 47. (b) 1/82 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of kapas. (iv) (a) 1956 - contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1081 lb/ac. (ii) 214.3 lb/ac. (iii) Main effect of D alone is significant. (iv) Av. yield of kapas in lb/ac.

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<th>I_1</th>
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<th>I_3</th>
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<td>1081</td>
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<tr>
<td>S.E. of body of any table = 61.9 lb/ac.</td>
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Crop: Cotton (Kharif).
Ref: I.A.R.I. 58(46).

Type: \( \text{JCM}^3 \).

Object: To study the relationship of irrigation, nitrogen levels and sowing dates on the yield of Cotton.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) As per treatments. (iv) (a) 6 deep ploughings and 4 \text{irrigation} weeks to 6 N.A. (v) and (vi) N.A. (vii) As per treatments. (viii) Horse hoeing and weeding. (ix) 26.5\(^{\circ}\). (x) 112.19\(^{\circ}\) onwards.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 water regions: \( I_1 = 0.33, I_2 = 0.75 \) and \( I_3 = 1.40 \) in \text{irrigation}.
(2) 3 levels of N as C: N: N_1 = 20, N_2 = 40 and N_3 = 60 lb/ac.
(3) 3 dates of sowing: D_1 = 1.5.1958, D_2 = 20.5.1958 and D_3 = 1.6.1958.

3. DESIGN:
(i) 33 partial confd. (D1N12 and D1N1 are partially confd.) (ii) 9 plots/block ; 3 blocks/replication. (b) N.A. (c) (ii) N.A. (d) N.A. (e) N.A. (vi) to (vii) Nil.

4. GENERAL:
(i) Normal. (ii) Jassids, boll worms and grey bettle. (iii) Yield of kapas. (iv) (a) and (v) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 365 lb/ac. (ii) 82.7 lb/ac. (iii) Main effect of D alone is highly significant. (iv) Av. yield of kapas in lb/ac.
Crop :- Cotton.


Ref :- I.A.R.I. 56(33).

Type :- 'CD'.

Object :- To study the effect of T.C.A., P.C.P., 2, 4-D and cultural treatments in controlling weeds in Cotton.

1. BASAL CONDITIONS:

(b) (a) to (c) N.A. (ii) (a) Heavy loam. (b) N.A. (iii) 5.5.1956. (iv) (a) to (e) N.A. (v) 30 lb./ac. of N as A/S+30 lb./ac. of P₂O₅ as Super applied as broadcast before planting and mixed with the soil. (vi) F.=—116. (vii) Irrigated. (viii) As per treatments. (ix) 16.67". (x) 18 to 20.9.1956, 3 to 4.10.1956 and 5 to 8.11.1956.

2. TREATMENTS:

25 weed control treatments : C₀ = Control, C₁ = Weeding by hand, C₂ = Hoeing with cultivator, C₃ = Pre-emergence spray of T.C.A. at 3 lb./ac., C₄ = Pre-emergence spray of T.C.A. at 6 lb./ac., C₅ = Post-emergence spray of T.C.A. at 3 lb./ac., C₆ = Post-emergence spray of T.C.A. at 6 lb./ac., C₇ = Post-emergence spray of T.C.A. at 9 lb./ac., C₈ = C₉ + C₁₀, C₉ = C₃ + C₄, C₁₀ = Pre-emergence spray of P.C.P. at 3 lb./ac., C₁₁ = Post-emergence spray of P.C.P. at 6 lb./ac., C₁₂ = Pre-emergence spray of P.C.P. at 9 lb./ac., C₁₃ = Pre-emergence spray of 2, 4-D at 4 ozs./ac., C₁₄ = Pre-emergence spray of 2, 4-D at 6 ozs./ac., C₁₅ = Pre-emergence spray of 2, 4-D at 8 ozs./ac., C₁₆ = Post-emergence spray of 2, 4-D at 10 ozs./ac.

3. DESIGN:

5 x 5 lattice. (ii) (a) 5 plots/block; 5 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 32' X 26'. (b) 30' X 18'. (v) 1' X 4'. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Attack of pinle boll worm. (iii) Height, number of bolls, number of branches per plant and yield of kapas. (iv) (a) 1956—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 910 lb./ac. (ii) 134.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

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<th>C₂</th>
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Mean | I₁ | I₂ | I₃ |
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>363</td>
<td>365</td>
<td>372</td>
<td>333</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 19.5 lb./ac.
S.E. of body of any table = 33.8 lb./ac.

S.E./mean = 77.4 lb./ac.
Crop :- Cotton ('Kharif').
Object :- To study the effectiveness of three weedicides (T.C.A., P.C.P., 2, 4-D) over indigenous method of weed control in Cotton.

1. BASAL CONDITIONS:
   (i) to (vii) N.A. (viii) As per treatments. (ix) N.A. (x) 18.12.1957.

2. TREATMENTS:
   25 weed control treatments : C0 = Control, C1 = 6 lb./ac. of T.C.A. as pre-emergence spray, C2 = 12 lb./ac. of T.C.A. as pre-emergence spray, C3 = 6 lb./ac. of T.C.A. as post-emergence spray, C4 = 6 lb./ac. of T.C.A. as post-emergence spray, C5 = 9 lb./ac. of P.C.P. as pre-emergence spray, C6 = 3 lb./ac. of P.C.P. as post-emergence spray, C7 = 3 lb./ac. of P.C.P. as pre-post-emergence spray, C8 = 6 lb./ac. of T.C.A. as pre-emergence spray+hoeing, C9 = 6 lb./ac. of T.C.A. as post-emergence spray+hoeing, C10 = 3 lb./ac. of P.C.P. as pre-emergence spray+hoeing, C11 = 3 lb./ac. of P.C.P. as post-emergence spray+hoeing, C12 = 3 lb./ac. of 2, 4-D as pre-emergence spray, C13 = 3 lb./ac. of 2, 4-D as post-emergence spray, C14 = 3 lb./ac. of 2, 4-D as pre-emergence spray+hoeing, C15 = 3 lb./ac. of 2, 4-D as post-emergence spray+hoeing, C16 = 3 lb./ac. of 2, 4-D as pre-emergence spray+hoeing, C17 = 3 lb./ac. of 2, 4-D as post-emergence spray+hoeing, C18 = 3 lb./ac. of 2, 4-D as pre-emergence spray+hoeing, C19 = 3 lb./ac. of 2, 4-D as post-emergence spray+hoeing, C20 = 3 lb./ac. of 2, 4-D as pre-emergence spray+hoeing, C21 = 3 lb./ac. of 2, 4-D as post-emergence spray+hoeing, C22 = 3 lb./ac. of 2, 4-D as pre-emergence spray+hoeing, C23 = 3 lb./ac. of 2, 4-D as post-emergence spray+hoeing, C24 = 3 lb./ac. of 2, 4-D as pre-emergence spray+hoeing, C25 = 3 lb./ac. of 2, 4-D as post-emergence spray+hoeing.

3. DESIGN:
   (i) Simple lattice. (ii) 5 plots/block ; 5 blocks/replication. (b) N.A. (vi) 5 x 5. (vii) 3 x 3. (vi) Yen.

4. GENERAL:
   (i) Poor growth. (ii) Attack of pink boll worm and jassids and red leaf disease. (iii) Yield of kapas. (iv) (a) 1956-continue. (b) N.A. (c) N/A. (v) and (vi) N/A.

5. RESULTS:
   (i) 205 lb./ac. (ii) 55.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

   Treatment  C0  C1  C2  C3  C4  C5  C6  C7  C8  C9  C10  C11  C12  C13  C14  C15  C16  C17  C18  C19  C20  C21  C22  C23  C24  C25
   Av. yield  218  207  215  216  144  251  187  153  254  188  142  163  199  197  173  234  213  240  420  182  109  1.5  154  280  261  5.1 lb./ac.
3. DESIGN:
(i) 5 x 5 lattice, (ii) 5 plots/block; 5 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 22'x20', (b) 26'x14', (v) 3'x3'. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A. (iii) Yield of kapas. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 142.0 lb./ac. (ii) 30.4 lb./ac. (iii) Treatments differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C_1</th>
<th>C_2</th>
<th>C_3</th>
<th>C_4</th>
<th>C_5</th>
<th>C_6</th>
<th>C_7</th>
<th>C_8</th>
<th>C_9</th>
<th>C_10</th>
<th>C_11</th>
<th>C_12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>92.2</td>
<td>435.0</td>
<td>329.1</td>
<td>97.6</td>
<td>70.8</td>
<td>105.6</td>
<td>66.1</td>
<td>55.8</td>
<td>88.4</td>
<td>74.9</td>
<td>327.9</td>
<td>309.7</td>
</tr>
</tbody>
</table>

S.E./mean = 17.55 lb./ac.

Ref: I.A.R.I. 55(24). Type: 'M'.

Object: To study the effect of different levels of N, P and K on Hookah Tobacco.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) N.A./18 an 29.1.1955. (iv) (a) 1 victory ploughing and 3 desi ploughings. (b) to (e) N.A. (v) 10 tons/ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 18 to 24.5.1955.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S: N_0 = 0, N_1 = 40 and N_2 = 80 lb./ac.
(2) 3 levels of P as Super: P_0 = 0, P_1 = 40 and P_2 = 80 lb./ac.
(3) 3 levels of K as Pot. Sul.: K_0 = 0, K_1 = 40 and K_2 = 80 lb./ac.

3. DESIGN:
(i) 3 partially conf. (ii) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 24'x27', (b) 22'x24', (v) 1'x1'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of leaf. (iv) (a) 1953—1957. (b) N.A. (c) Nil. (v) and (vi) Nil. (vii) Data for exp. conducted in 1954 and 1956 N.A.

5. RESULTS:
(i) 1071 lb./ac. (ii) 356.4 lb./ac. (iii) Main effects of N and P are significant. (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>Mean</th>
<th>K_0</th>
<th>K_1</th>
<th>K_2</th>
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</thead>
<tbody>
<tr>
<td>813</td>
<td>947</td>
<td>802</td>
<td>824</td>
<td>679</td>
<td>902</td>
<td>980</td>
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<td>875</td>
<td>1162</td>
<td>1419</td>
<td>1152</td>
<td>1068</td>
<td>1137</td>
<td>1250</td>
</tr>
<tr>
<td>978</td>
<td>1389</td>
<td>1251</td>
<td>1206</td>
<td>1200</td>
<td>1071</td>
<td>1287</td>
</tr>
<tr>
<td>Mean</td>
<td>889</td>
<td>1176</td>
<td>1157</td>
<td>1071</td>
<td>1001</td>
<td>1037</td>
</tr>
</tbody>
</table>

K_0  881  1060  1066
K_1  752  1189  1169
K_2  1031  1249  1238
Crop: Tobacco (Rabi).
Object: To study the effect of different levels of N, P and K on Hookah Tobacco.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 17.11.1957 to 22.1.1958. (iv) (a) 1 ploughing and 2 double discings. (b) Transplanting. (c) to (e) N.A. (vi) Block. (vii) Irrigated. (viii) 6 weedings. (ix) N.A.
(x) 15.5.1958.

2. TREATMENTS:
Same as in expt. no. 55(24) on page 442.

3. DESIGN:
(i) 3 partially confd. Confounding NP and NK. (ii) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 42' x 20'. (b) 40' x 18'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
Same as in expt. no. 55(24) on page 442.

5. RESULTS:
(i) 2075 lb./ac. (ii) 54.5 lb./ac. (iii) Main effects of N and P are highly significant. (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P&lt;sub&gt;0&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;</th>
<th>Mean</th>
<th>K&lt;sub&gt;0&lt;/sub&gt;</th>
<th>K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;</th>
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<td>1716</td>
<td>1433</td>
<td>1336</td>
<td>1391</td>
<td>1573</td>
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<tr>
<td>N&lt;sub&gt;1&lt;/sub&gt;</td>
<td>1918</td>
<td>2166</td>
<td>2708</td>
<td>2264</td>
<td>2239</td>
<td>2322</td>
<td>2225</td>
</tr>
<tr>
<td>N&lt;sub&gt;2&lt;/sub&gt;</td>
<td>2147</td>
<td>2481</td>
<td>2954</td>
<td>2527</td>
<td>2518</td>
<td>2528</td>
<td>2536</td>
</tr>
<tr>
<td>Mean</td>
<td>1777</td>
<td>1988</td>
<td>2459</td>
<td>2075</td>
<td>2031</td>
<td>2080</td>
<td>2111</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 12.8 lb./ac.
S.E. of body of any table = 22.2 lb./ac.

Crop: Tobacco.
Object: To study the effect of flood and furrow irrigation, different levels of N and methods of planting on Tobacco.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) N.A./February, 1959. (iv) (a) 1 triphali. (b) Transplanting. (c) to (e) N.A. (v) N.A. (vi) N.P.–219. (vii) Irrigated. (viii) 6 weedings and hoeings. (ix) N.A. (x) May, 1960.
2. TREATMENTS:

Main-plot treatments:

All combinations of (1) and (2)

(1) 5 levels of N: N0=0, N1=40, N2=80, N3=120 and N4=160 lb./ac.

(2) 2 methods of transplanting: M1=Flush and M2=Furrow.

Sub-plot treatments:

4 levels of irrigation: I1=1.0", I2=1.5", I3=2.0" and I4=2.5".

3. DESIGN:

(i) Split-plot. (ii) (a) 10 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 30' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Yield of tobacco. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 259 lb./ac. (ii) (a) 344.6 lb./ac. (b) 961.8 lb./ac. (iii) Main effect of N and interaction MxI are highly significant. Main effect of N is significant. (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
<th>Mean</th>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>I4</th>
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<tbody>
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<td>M1</td>
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<td>2799</td>
<td>3137</td>
<td>3216</td>
<td>3332</td>
<td>2929</td>
<td>3546</td>
<td>2788</td>
<td>3109</td>
<td>2715</td>
</tr>
<tr>
<td>M2</td>
<td>2172</td>
<td>2371</td>
<td>2933</td>
<td>3151</td>
<td>3313</td>
<td>2788</td>
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<tr>
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<td>3035</td>
<td>3184</td>
<td>3323</td>
<td>2839</td>
<td>3030</td>
<td>2899</td>
<td>2887</td>
<td>2600</td>
</tr>
<tr>
<td>I1</td>
<td>2313</td>
<td>2673</td>
<td>3213</td>
<td>3427</td>
<td>3600</td>
<td></td>
<td>99.5 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I2</td>
<td>2175</td>
<td>2696</td>
<td>3231</td>
<td>3167</td>
<td>3223</td>
<td></td>
<td>555.3 lb./ac.</td>
<td>S.E. of body of N X M table 99.5 lb./ac.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I3</td>
<td>2117</td>
<td>2547</td>
<td>2989</td>
<td>3225</td>
<td>3459</td>
<td></td>
<td>555.3 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I4</td>
<td>2185</td>
<td>2303</td>
<td>2685</td>
<td>2816</td>
<td>3008</td>
<td></td>
<td>555.3 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. N marginal means = 99.5 lb./ac. 5. N means at the same level of I = 491.1 lb./ac.

2. M marginal means = 62.9 lb./ac. 6. I means at the same level of M = 351.2 lb./ac.

3. I marginal means = 248.3 lb./ac. 7. M means at the same level of I = 310.6 lb./ac.

4. I means at the same level of N = 555.3 lb./ac. S.E. of body of N X M table = 99.5 lb./ac.

Crop: Sesamum (Kharif).


Type: 'M'.

Object: To study the effect of different levels of N and P with different sources of N on Sesamum.

1. BASAL CONDITIONS:

(i) and (ii) N.A. (iii) 6.7.1955. (iv) (a) 1 ploughing and 2 discings. (b) to (e) N.A. (v) N.I. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing, 1 weeding and 1 thinning. (ix) N.A. (x) 10 to 15.10.1955.

2. TREATMENTS:

Main-plot treatments:

3 sources of N: S1=A/S, S2=F.Y.M and S3=G.N.C.

Sub-plot treatments:

All combinations of (1) and (2)

(1) 3 levels of N: N0=0, N1=30 and N2=60 lb./ac.

(2) 2 levels of P0O: P0=0 and P2=80 lb./ac.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication: 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 34' x 23'. (b) 33' x 22'. (e) 0.5' x 0.5'. (vi) Yes.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of seaamum. (iv) (a) 1952—cond. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 662 lb/ac. (ii) (a) 126.8 lb/ac. (b) 77.5 lb/ac. (iii) None of the effects is significant. (iv) Av. yield of seed in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>688</td>
<td>657</td>
<td>596</td>
<td>647</td>
<td>635</td>
<td>610</td>
<td>666</td>
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<tr>
<td>P1</td>
<td>700</td>
<td>644</td>
<td>617</td>
<td>677</td>
<td>709</td>
<td>633</td>
<td>689</td>
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<tr>
<td>Mean</td>
<td>694</td>
<td>651</td>
<td>641</td>
<td>662</td>
<td>672</td>
<td>622</td>
<td>693</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. S marginal means = 36.6 lb/ac. 5. S means at the same level of P = 42.9 lb/ac.
2. P marginal means = 18.3 lb/ac. 6. N means at the same level of S = 38.7 lb/ac.
3. N marginal means = 22.4 lb/ac. 7. S means at the same level of N = 48.4 lb/ac.
4. P means at the same level of S = 31.6 lb/ac. S.E. of body of N X P table = 22.4 lb/ac.

---


Object:—To study the effect of N and P through different sources on the yield of Seaamum.

1. BASAL CONDITIONS:
(i) (a) No. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 17.7.1956. (iv) (a) Tractor ploughing, grubbing and digging. (b) to (e) N.A. (v) N.A. (vi) N.P.—6. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 22.3’. (x) 16 and 17.10.1956.

2. TREATMENTS:
Same as in exp. no. 55(25) on page 444.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main plots/replicates and 6 sub-plots/main-plot. (b) N.A. [(iii) 4. (iv) (a) 35’x24’. (b) 33’x22’. (v) 1.0’x1.0’. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Heavy attack of stem borer and stem rot. (iii) Yield of seaamum. (iv) (a) 1952—1957. (b) Yes. (c) No. (v) (a) and (b) No. (vi) Nil. (vii) Other tables are available.

5. RESULTS:
(i) 247 lb/ac. (ii) (a) 56.4 lb/ac. (b) 102.6 lb/ac. (iii) Only N effect is significant. (iv) Av. yield of seed in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
</tr>
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<td>P0</td>
<td>164</td>
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<td>P1</td>
<td>214</td>
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<tr>
<td>Mean</td>
<td>189</td>
<td>300</td>
<td>251</td>
<td>247</td>
</tr>
</tbody>
</table>
Crop :- Sesamum (Kharif).

Object :- To study the effect of N, P and micro-nutrients on Sesamum.

1. BASAL CONDITIONS :
   (i) and (ii) N.A. (iii) 1.7.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 2 weedings.
   (ix) N.A. (x) 9 and 10.10.1954.

2. TREATMENTS :
   12 manurial treatments: 
   - Mo = Control
   - M₁ = 30 lb./ac. of N
   - M₂ = 60 lb./ac. of P₂O₅
   - M₃ = 30 lb./ac. of N + 60 lb./ac. of P₂O₅
   - M₄ = M₃ + 5 lb./ac. of Borax through soil + 2 lb./ac. of Borax by spraying at maximum growth on foliage
   - M₅ = M₃ + 50 lb./ac. of MnSO₄ through soil + 5 lb./ac. of MnSO₄ by spraying
   - M₆ = M₅ + 75 lb./ac. of MnSO₄ through soil + 5 lb./ac. of MnSO₄ by spraying
   - M₇ = Ms + 75 lb./ac. of MnSO₄ through soil + 5 lb./ac. of MnSO₄ by spraying
   - M₈ = 5 lb./ac. of Borax through soil + 2 lb./ac. of Borax by spraying
   - M₉ = 10 lb./ac. of Borax through soil + 2 lb./ac. of Borax by spraying
   - M₁₀ = 50 lb./ac. of MnSO₄ through soil + 5 lb./ac. of MnSO₄ by spraying
   - M₁₁ = 75 lb./ac. of MnSO₄ through soil + 5 lb./ac. of MnSO₄ by spraying

3. DESIGN :
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 14' x 35'. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Yield of sesamum. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil.
   (vi) Heavy rain fall at maturity damaged the crop. (vii) Nil.

5. RESULTS :
   (i) 151 lb./ac. (ii) 68.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of sesamum in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>M₀</td>
<td>143</td>
</tr>
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</tr>
<tr>
<td>M₉</td>
<td>143</td>
</tr>
<tr>
<td>M₁₀</td>
<td>143</td>
</tr>
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</table>

S.E./mean = 30.4 lb./ac.

Crop :- Sesamum (Kharif).

Object :- To study the effect of N, P and micro-nutrients on Sesamum.

1. BASAL CONDITIONS :
   (i) and (ii) N.A. (iii) 23.7.1955. (iv) (a) 4 ploughings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated.
   (viii) 3 weedings and 3 thinnings. (ix) N.A. (x) 28 and 31.10.1:55.

2. TREATMENTS to 4. GENERAL :
   Same as in exp. no. 54(35) above.

5. RESULTS :
   (i) 106 lb./ac. (ii) 68.9 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of sesamum in lb./ac.
Crop > Sesamum (Kharij).
Ref > I.A.R.I. 56(40).
Type > 'M'.
Object > To study the effect of N, P and micro-nutrients on Sesamum.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Oats. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 23.7.1956. (iv) (a) Tractor ploughing, grubbing and discing. (b) to (e) N.A. (v) Nil. (vi) Strain ‘S’. (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) 16.69'. (x) 17.10.1956.

2. TREATMENTS:
   Same as in exp. no. 54(35) on page 446.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (effective replications are 2). (iv) (a) 16' x 37'. (b) 14' x 35'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Attack of stem rot in 2 replications. (iii) Yield of sesamum. (iv) (a) 1952—N.A. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) In 2 replications the crop failed due to the stagnation of water in the field and stem rot attack on the crop. (vii) Nil.

5. RESULTS:
   (i) 843 lb./ac. (ii) 237.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of sesamum in lb./ac.
   Treatment M0 M1 M2 M3 M4 M5 M6 M7 M8 M9 M10 M11
   Av. yield 855 1070 798 1020 979 724 782 864 617 806 716 880
   S.E./mean = 167.9 lb./ac.

Crop > Linseed.
Ref > I.A.R.I. 57(49).
Type > 'M'.
Object > To study the uptake of P by Linseed with the help of radiotracer technique.

1. BASAL CONDITIONS:
   (i) to (iv) N.A. (v) 60 lb./ac. of N+30 lb./ac. of K2O. (vi) to (k) N.A.

2. TREATMENTS:
   7 methods of application of 30 lb./ac. of P2O5: M0=Control, M1=Mixed with top 2" soil, M2=Mixed with top 4" soil, M3=Single band 1" below the seed, M4=Single band 3" below the seed, M5=Double band 1" below the seed and 24" side ways and M6=Double band 3" below the seed and 24" side ways.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 15' x 74'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Seed yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
   (i) 1007 lb./ac.  (ii) 151.4 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>887</td>
<td>879</td>
<td>969</td>
<td>1129</td>
<td>1169</td>
<td>979</td>
<td>1038</td>
</tr>
</tbody>
</table>

S.E./mean = 75.7 lb./ac.

Crop: Linseed.
Ref: I.A.R.I. 58(58).
Type: 'M'.

Object: To study the uptake of P by Linseed with the help of radiotracer technique.

1. BASAL CONDITIONS:
   (i) to (iv) N.A.  (v) 60 lb./ac. of N + 30 lb./ac. of K₂O.  (vi) to (x) N.A.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 57(49) on page 447.

5. RESULTS:
   (i) 1939 lb./ac.  (ii) 232.0 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1916</td>
<td>1776</td>
<td>1804</td>
<td>2036</td>
<td>2250</td>
<td>1824</td>
<td>1966</td>
</tr>
</tbody>
</table>

S.E./mean = 116.0 lb./ac.

Crop: Linseed.
Ref: I.A.R.I. 57(59).
Type: 'M'.

Object: To study the effect of different levels of N, P and K on Linseed.

1. BASAL CONDITIONS:
   (i) and (ii) N.A.  (iii) 23.11.1957.  (iv) to (vi) N.A.  (vii) Irrigated.  (viii) 4 weedings.  (ix) N.A.  (x) 21 and 22.4.1958.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N₀=0, N₁=30 and N₂=60 lb./ac.
   (2) 3 levels of P₂O₅: P₀=0, P₁=20 and P₂=40 lb./ac.
   (3) 3 levels of K₂O: K₀=0, K₁=20 and K₂=40 lb./ac.

3. DESIGN:
   (i) 3² confd.  (ii) 9 plots/block and 3 blocks/replication.  (b) N.A.  (iii) 2.  (iv) (a) 32'×20', (b) 28'×15', (v) 2'×2'.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  (ii) Nil.  (iii) Yield of seed.  (iv) (a) 1957 –contd.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
   (i) 1368 lb./ac.  (ii) 78.1 lb./ac.  (iii) Main effect of N is highly significant.  Main effect of K is significant.  Interactions N×P, P×K and N×P×K are highly significant.  (iv) Av. yield of seed in lb./ac.
## Object
To study the effect of different levels of N, P, and K on Linseed.

## Basal Conditions
(i) and (ii) N.A. (iii) 3.11.1958. (iv) to (vi) N.A. (vii) Irrigated. (viii) 3 weedicides and 3 hoeings.  (ix) N.A. (x) 7.4.1958.

## Treatments
Same as in expt. no. 57(50) on page 448.

## Design
(i) 3 rep. conf.  (ii) (a) 9 plots/block and 3 blocks/replication.  (b) N.A. (iii) 2.  (iv) (a) 32' x 20'. (b) 28' x 18'. (v) 2' x 1'. (vi) Yes.

## General
(i) Good.  (ii) Nil.  (iii) Yields of seed.  (iv) (a) 1957—contd.  (b) No.  (c) Nil.  (d) No.  (e) Nil.

## Results
(i) 1763 lb./ac.  (ii) 219.5 lb./ac.  (iii) Only main effect of N is highly significant.  (iv) Average yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
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<tr>
<td>N₀</td>
<td>1154</td>
<td>1067</td>
<td>508</td>
<td>1043</td>
<td>1078</td>
<td>1019</td>
<td>1033</td>
</tr>
<tr>
<td>N₁</td>
<td>1403</td>
<td>1415</td>
<td>1490</td>
<td>1437</td>
<td>1502</td>
<td>1380</td>
<td>1428</td>
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<tr>
<td>N₂</td>
<td>1638</td>
<td>1618</td>
<td>1649</td>
<td>1625</td>
<td>1647</td>
<td>1595</td>
<td>1633</td>
</tr>
<tr>
<td>Mean</td>
<td>1389</td>
<td>1367</td>
<td>1349</td>
<td>1368</td>
<td>1409</td>
<td>1331</td>
<td>1365</td>
</tr>
<tr>
<td>K₀</td>
<td>1413</td>
<td>1449</td>
<td>1364</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K₁</td>
<td>1291</td>
<td>1342</td>
<td>1361</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>K₂</td>
<td>1463</td>
<td>1310</td>
<td>1322</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 18.4 lb./ac.
S.E. of body of any table = 31.9 lb./ac.

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**Crop**: Linseed (Rabi).

**Site**: Indian Agri. Res. Inst., New Delhi.

**Ref**: I.A.R.I. 58(49).

**Type**: 'M'.
Crop: Linseed.
Object: To study the response of Linseed to N.

1. BASAL CONDITIONS:

(i) (a) Linseed—Maize. (b) Maize. (c) Nil. (i) (a) Sandy loam. (b) N.A. (iii) 5.11.1956. (iv) (a) Victory ploughing, country ploughing, discing and grubbing. (b) to (e) N.A. (vi) R.R.—9 (medium). (vii) Irrigated. (viii) 1 seeding and 1 hoeing. (ix) 5.59'. (x) 18.4.1957.

2. TREATMENTS:

Main-plot treatments:
4 sources of N: S1=A/S, S2=A/S+N, S3=Urea and S4=Nangal salt.
Sub-plot treatments:
5 levels of N: N0=0, N1=10, N2=20, N3=40 and N4=80 lb./ac.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 38'x14'. (b) 36 'x12'. (v) 2'x1'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Seed yield. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) and (vi) Raw data and two-way table: N.A.

5. RESULTS:

(i) 1028 lb. (ac). (ii) (a) 180.2 lb. (ac). (b) 158.0 lb. (ac). (iii) Main effect of N alone is highly significant. (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1095</td>
<td>1011</td>
<td>1003</td>
<td>1003</td>
<td>833</td>
<td>952</td>
<td>966</td>
<td>1182</td>
<td>1209</td>
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<tr>
<td>S.E. of difference of two marginal means</td>
<td>= 57.0 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N marginal means</td>
<td>= 55.9 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Crop: Linseed (Rabi).
Object: To study the effect of N, P and micro-nutrients on Linseed.

1. BASAL CONDITIONS:

(i) and (ii) N.A. (iii) 18.10.1954. (iv) (a) 4 ploughings and 2 grubblings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 15 to 18.4.1955.

2. TREATMENTS:

12 manural treatments: M0=Control, M1=30 lb./ac. of N, M2=60 lb./ac. of P2O5, M3=30 lb./ac. of N+60 lb./ac. of P2O5, M4=M3+10 lb./ac. of Borax through soil+2 lb./ac. of Borax by spraying, M5=M3+10 lb./ac. of Borax by spraying, M6=M3+50 lb./ac. of MnSO4 through soil+5 lb./ac. of MnSO4 by spraying, M7=M3+75 lb./ac. of MnSO4 through soil+5 lb./ac. of MnSO4 by spraying, M8=M3+10 lb./ac. of Borax through soil+2 lb./ac. of Borax by spraying, M9=M3+75 lb./ac. of MnSO4 through soil+5 lb./ac. of MnSO4 by spraying and M11=75 lb./ac. of MnSO4 through soil+5 lb./ac. of MnSO4 by spraying.

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 14'x33'. (b) 12'x33'. (v) 'x'. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of seed. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 199 lb./ac. (ii) 195 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>M_4</th>
<th>M_5</th>
<th>M_6</th>
<th>M_7</th>
<th>M_8</th>
<th>M_9</th>
<th>M_10</th>
<th>M_11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>741</td>
<td>836</td>
<td>692</td>
<td>807</td>
<td>811</td>
<td>755</td>
<td>865</td>
<td>904</td>
<td>755</td>
<td>789</td>
<td>777</td>
<td>735</td>
</tr>
</tbody>
</table>
S.E./mean = 97.5 lb./ac.

Crop : Linseed (Rabi).
Object : To study the effect of N, P and micro-nutrients on Linseed.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 23.10.1955. (iv) (a) 2 grubblings and 2 beamings. (b) N.A. (c) 10 lb./ac. (d) and (e) N.A. (v) Nil. (vi) R.R.—197. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 9 to 13.4.1956.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 54(36) on page 450.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Yield of seed. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 720 lb./ac. (ii) 284.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>M_4</th>
<th>M_5</th>
<th>M_6</th>
<th>M_7</th>
<th>M_8</th>
<th>M_9</th>
<th>M_10</th>
<th>M_11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1992</td>
<td>2198</td>
<td>1855</td>
<td>2485</td>
<td>2376</td>
<td>2277</td>
<td>2433</td>
<td>2365</td>
<td>2126</td>
<td>2190</td>
<td>2054</td>
<td>2241</td>
</tr>
</tbody>
</table>
S.E./mean = 142.2 lb./ac.

Crop : Linseed.
Object : To study the effect of N, P and micro-nutrients on Linseed.

1. BASAL CONDITIONS:
(i) Jowar fodder. (c) Nil. (ii) Clay loam. (b) N.A. (iii) 1.11.1956. (iv) (a) Tractor ploughing, grubbing and discing. (b) to (e) N.A. (v) Nil. (vi) R.R.—197. (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) 5.59. (x) 20.4.1957.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 54(36) on page 410.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of seed. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Crop suffered due to hailstorm. (vii) Nil.

5. RESULTS:
(i) 1702 lb./ac. (ii) 226.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>M_4</th>
<th>M_5</th>
<th>M_6</th>
<th>M_7</th>
<th>M_8</th>
<th>M_9</th>
<th>M_10</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1577</td>
<td>1997</td>
<td>1154</td>
<td>1945</td>
<td>1641</td>
<td>1591</td>
<td>1896</td>
<td>1955</td>
<td>1613</td>
<td>1531</td>
<td>1634</td>
<td>1595</td>
</tr>
</tbody>
</table>
S.E./mean = 114.4 lb./ac.
Crop := Linseed.

Ref := I.A.R.I. 57(31).


Type := 'MV'.

Object := To study the effect of split application of nitrogen dose on Linseed at different times.

1. BASAL CONDITIONS :
(i) and (ii) N.A. (iii) 21.11.1957. (iv) (a) Double discing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 3 weedings and 3 hoeings. (ix) N.A. (x) 24.4.1958.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N as A/S : N₁ = 20, N₂ = 40 and N₃ = 60 lb/ac.
(2) 3 times of application : T₁ = Full at sowing, T₂ = ⅓ at sowing + ⅔ after 1 month and T₃ = ⅔ after 1 month + ⅔ after 7 months.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 20' × 42'. (b) 16' × 38'. (v) 2' × 2'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—N.A. (b) and (c) N.A. (v) and (vi) Nil. (vii) Raw data and two-way table : N.A.

5. RESULTS:
(i) 1684 lb/ac. (ii) 208.2 lb/ac. (iii) Only N effect is highly significant. (iv) Av. yield of seed in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>1493</td>
<td>1730</td>
<td>1828</td>
<td>1677</td>
<td>1660</td>
<td>1715</td>
</tr>
</tbody>
</table>

S.E. of N or T marginal mean = 60.1 lb/ac.

---

Crop := Linseed (Rabi).

Ref := I.A.R.I. 58(50).


Type := 'MV'.

Object := To study the effect of different levels of N on different varieties of Linseed.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 14.10.1958. (iv) (a) 3 ploughings with desi plough, 2 ploughings with triphali and 1 ploughing with Victory plough. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding with kharipji. (ix) N.A. (x) 11.4.1959.

2. TREATMENTS:
All combinations of (1) and (2)
(2) 3 levels of N : N₁ = 0, N₂ = 20 and N₃ = 40 lb/ac.

3. DESIGN:
(i) Fact in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 25' × 10'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Seed yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) to (vi) Nil.

5. RESULTS:
(i) 438 lb/ac. (ii) 869.9 lb/ac. (iii) None of the effects is significant. (iv) Av. yield of seed in lb/ac.
Crop: Linseed (Rahi).
Ref: I.A.R.I. 59(38).
Site: Indian Agri. Res. Instt., New Delhi. Type: 'MV'.

Object:—To study the effect of different levels of N on different varieties of Linseed.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 14.10.1959. (iv) (a) 1 ploughing with Victory plough, 3 ploughings with desi plough and 2 ploughings with triphall. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) N.A. (viii) 1 weeding. (ix) N.A. (x) 11.4.1960.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 58(50) on page 452.

5. RESULTS:
(i) 376 lb./ac. (ii) 62.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
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</tr>
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<tr>
<td>V0</td>
<td>511</td>
<td>446</td>
<td>459</td>
<td>509</td>
<td>481</td>
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</tr>
<tr>
<td>Mean</td>
<td>529</td>
<td>463</td>
<td>480</td>
<td>480</td>
<td>488</td>
</tr>
</tbody>
</table>

S.E. of V marginal mean = 257.1 lb./ac.
S.E. of N marginal mean = 227.7 lb./ac.
S.E. of body of table = 445.4 lb./ac.

Crop: Linseed (Rahi).
Ref: I.A.R.I. 55(23).
Site: Indian Agri. Res. Instt., New Delhi. Type: 'MV'.

Object:—To study the effect of N and P on different varieties of Linseed.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 20 and 21.10.1955. (iv) (a) 1 tractor ploughing, 2 desi ploughings, 1 discing, levelling and beaming. (b) to (c) N.A. (v) Nil. (vi) As per treatments. (vii) Iriaged. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) 15 to 17.4.1956.
2. TREATMENTS:

Main plot treatments:
3 varieties: $V_1 = \text{R.R.} - 10$, $V_2 = \text{R.R.} - 236$ and $V_3 = \text{N.P.} - 12$.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 3 levels of N as A/S: $N_0 = 0$, $N_1 = 20$ and $N_2 = 40$ lb./ac.
(2) 2 levels of P as Super: $P_0 = 0$ and $P_1 = 60$ lb./ac.

Sub-sub-plot treatments:
2 methods of placement: $M_1 = \text{Broadcast}$ and $M_2 = \text{Placement}$.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 6 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A.
(iii) 4. (iv) (a) and (b) 27' x 23'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of seed. (iv) (a) 1952--contd. (b) Yes. (c) N.A. (v) and (vi) Nil.
(vii) Other two way tables: N.A.

5. RESULTS:
(i) 1420 lb./ac. (ii) (a) 313.1 lb./ac. (b) 104.8 lb./ac. (c) N.A. (iii) Main effect of N is highly significant and interaction N X P is significant. (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>$M_1$</th>
<th>$M_2$</th>
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<tbody>
<tr>
<td>Av. yield</td>
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<td>1356</td>
<td>1489</td>
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<table>
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<tr>
<th></th>
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<tr>
<td>Mean</td>
<td>1333</td>
<td>1431</td>
<td>1497</td>
<td>1420</td>
</tr>
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</table>

S.E. of V marginal mean
S.E. of N marginal mean
S.E. of P marginal mean
S.E. of body of N x P table

Crop :- Linseed.
Object :- To study the effect of N and P on different varieties of Linseed.
5. RESULTS:
(i) 455 lb./ac. (ii) 128.9 lb./ac. (b) 71.0 lb./ac. (c) 41.4 lb./ac. (iii) Main effect of N is highly significant. Interaction N x P is significant. (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>M1</th>
<th>M2</th>
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<tr>
<td>Av. yield</td>
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<td>952</td>
<td>891</td>
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<table>
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<td>760</td>
<td>998</td>
<td>1118</td>
<td>959</td>
</tr>
<tr>
<td>Mean</td>
<td>773</td>
<td>983</td>
<td>1094</td>
</tr>
</tbody>
</table>

S.E. of M marginal mean = 4.9 lb./ac.
S.E. of V marginal mean = 18.6 lb./ac.
S.E. of N marginal mean = 10.2 lb./ac.
S.E. of P marginal mean = 8.4 lb./ac.
S.E. of body of N X P table = 14.5 lb./ac.

Crop = Maize fodder (Kharif).
Ref = I.A.R.I. 54(38).
Type = 'M'.

Object: To determine the interval between the application of F.Y.M. and sowing to obtain the optimum yield of Maize fodder.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 17.6.1954. (iv) (a) 4 ploughings and 1 rolling. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 hoening with desi plough and 2 weedings. (ix) N.A. (x) 3 to 6.9.1954.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2) i.e. a control
(1) 4 intervals of applying F.Y.M.: T₁ = 3, T₂ = 2, T₃ = 1 month before sowing and T₄ = 1 week before sowing of wheat.
(2) 3 levels of F.Y.M. to previous wheat crop: F₁ = 2, F₂ = 5 and F₃ = 10 tons/ac.

Sub-plot treatments:
2 levels of N as A/S: N₀ = 0 and N₁ = 8.9 lb./ac.

3. DESIGN:
(i) Split-plot. (b) (a) 13 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 32 × 18". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 4.10 tons/ac. (ii) (a) 2.09 tons/ac. (b) 0.91 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Control</th>
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</tr>
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<tr>
<td>F₁</td>
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<tr>
<td>F₂</td>
<td>3.89</td>
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<tr>
<td>F₃</td>
<td>3.89</td>
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<tr>
<td>Mean</td>
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</tr>
<tr>
<td>N₀</td>
<td>3.80</td>
</tr>
<tr>
<td>N₁</td>
<td>4.01</td>
</tr>
</tbody>
</table>
S.E. of difference of two

1. T marginal means = 0.60 tons/ac.
2. F marginal means = 0.52 tons/ac.
3. N marginal means = 0.18 tons/ac.
4. N means at the same level of T = 0.37 tons/ac.
5. T means at the same level of N = 0.66 tons/ac.

Crop :- Maize fodder (Kharif).
Object :- To study the residual effect of the interval between the application of F.Y.M. and sowing of wheat on succeeding Maize fodder.

1. BASAL CONDITIONS:
(i) Wheat—Maize. (b) Wheat. (c) As per treatments. - (ii) (a) and (b) N.A. (iii) 8.6.1955. (iv) (a) 2 ploughings. (b) Sowing behind the plough by kera. (c) to (e) N.A. (vi) Irrigated. (viii) 3 weedings. (ix) N.A. (ix) 30.8.1955 to 2.9.1955.

2. TREATMENTS:
Same as in exp. no. 54(38) on page 455.

3. DESIGN:
(i) Split-plot. (ii) (a) 13 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 32'x36'. (b) 32'x18'. (v) 9' on either side. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of fodder. (iv) (a) 1952—contd. (b) Yes. (c) Nil (d) (e) N.A.

5. RESULTS:
(i) 7.78 tons/ac (ii) (a) 2.87 tons/ac. (b) 1.03 tons/ac. (iii) N effect is highly significant. 'Control vs. others' and interaction 'N x control vs. others' are significant. (iv) Av. yield of fodder in tons/ac.

Control = 5.16 tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
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<th>F2</th>
<th>F3</th>
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<tbody>
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<tr>
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<td>7.75</td>
<td>8.00</td>
<td>7.10</td>
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<td>5.16</td>
<td>5.61</td>
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</table>

S.E. of difference of two

1. T marginal means = 0.83 tons/ac.
2. F marginal means = 0.72 tons/ac.
3. N marginal means = 0.23 tons/ac.
4. N means at the same level of T = 0.43 tons/ac.
5. N means at the same level of F = 0.37 tons/ac.
6. T means at the same level of N = 0.88 tons/ac.
1. BASAL CONDITIONS:
(i) (a) Wheat—Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) N.A. (iii) (a) 2.6.1956. (iv) (b) 4 ploughings. (b) N.A. (c) 20 yrs. (d) and (e) N.A. (v) N.A. (vi) F.F.—2. (vii) 1 hoeing. (ix) N.A. (x) 13, 14 and 16.6.1956.

2. TREATMENTS:
Same as in exp. no. 54(38) on page 455.

3. DESIGN:
(i) Split-plot. (ii) (a) 13 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 34' x 20'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Stem borer attack. (iii) Yield of fodder. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 6.12 tons/ac. (ii) (a) 2.05 tons/ac. (b) 0.68 tons/ac. (iii) N effect alone is significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
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<td>5.99</td>
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<td>5.55</td>
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</tr>
<tr>
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<td>7.14</td>
<td>6.40</td>
<td>6.61</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. T marginal means = 0.59 tons/ac. 5. T means at the same level of N = 0.62 tons/ac.
2. F marginal means = 0.51 tons/ac. 6. N means at the same level of F = 0.24 tons/ac.
3. N marginal means = 0.14 tons/ac. 7. F means at the same level of N = 0.54 tons/ac.
4. N means at the same level of T = 0.28 tons/ac. S.E. of body of T x F table = 0.72 tons/ac.

Crop :- Maize fodder (Kharif).

Object :- To study the residual effect of the interval between the application of F.Y.M. and sowing of wheat on succeeding Maize fodder.

1. BASAL CONDITIONS:
(i) (a) Wheat—Maize. (b) Wheat. (c) As per treatments. (ii) and (iii) N.A. (iv) (a) 3 ploughings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing. (ix) and (x) N.A.

2. TREATMENTS:
Same as in exp. no. 54(38) on page 455.

3. DESIGN:
(i) Split-plot. (ii) (a) 13 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 34' x 20'. (b) 32' x 18'. (v) 1' x 1'. (vi) Yes.

GENERAL:
(i) and (ii) N.A. (iii) Yield of fodder. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.
5. RESULTS:

(i) 4.60 tons/ac.  (ii) (a) 1.18 tons/ac. (b) 0.88 tons/ac.  (iii) Main effect of F is highly significant. 'Control vs. others' is significant.  (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>Mean</th>
</tr>
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<td></td>
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</tbody>
</table>

S.E. of difference of two
1. T marginal means = 0.34 tons/ac.  5. N means at the same level of N = 0.42 tons/ac.
2. F marginal means = 0.30 tons/ac.  6. T means at the same level of F = 0.31 tons/ac.
3. N marginal means = 0.18 tons/ac.  7. F means at the same level of N = 0.37 tons/ac.
4. N means at the same level of T = 0.36 tons/ac.  S.E. of body of T x F table = 0.42 tons/ac.

Crop: Maize fodder (Kharif).
Object: To study the residual effect of the interval between the application of F.Y.M. and sowing of wheat on succeeding Maize fodder.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 11 to 14.6.1958. (iv) (a) 1 ploughing. (b) to (e) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) 2.9.1958.

2. TREATMENTS:
   Same as in exp. no. 54(38) on page 455.

3. DESIGN:
   (i) Split-plot. (ii) (a) 13 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' x 34'. (b) 18' x 32'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Stem borer attack. (iii) Yield of fodder. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) Continuous rains in August 1958 and stem borer attack damaged the crop. Due to water lodging weeding could not be done. (vii) Nil.

5. RESULTS:
   (i) 1.85 tons/ac.  (ii) (a) 0.78 tons/ac. (b) 0.39 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
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Crop: Maize fodder (Kharif).
Object: To study the residual effect of the interval between the application of F.Y.M. and sowing of wheat on succeeding Maize fodder.

Ref: I.A.R.I. 58(iii). Type = 'M'.

Object: To study the residual effect of the interval between the application of F.Y.M. and sowing of wheat on succeeding Maize fodder.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 11 to 14.6.1958. (iv) (a) 1 ploughing. (b) to (e) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) N.A. (x) 2.9.1958.

2. TREATMENTS:
   Same as in exp. no. 54(38) on page 455.

3. DESIGN:
   (i) Split-plot. (ii) (a) 13 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' x 34'. (b) 18' x 32'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Stem borer attack. (iii) Yield of fodder. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) Continuous rains in August 1958 and stem borer attack damaged the crop. Due to water lodging weeding could not be done. (vii) Nil.

5. RESULTS:
   (i) 1.85 tons/ac.  (ii) (a) 0.78 tons/ac. (b) 0.39 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in tons/ac.
S.E. of difference of two

1. T marginal means $= 0.23$ tons/ac. 5. F means at the same level of N $= 0.22$ tons/ac.
2. F marginal means $= 0.20$ tons/ac. 6. N means at the same level of T $= 0.16$ tons/ac.
3. N marginal means $= 0.08$ tons/ac. 7. T means at the same level of N $= 0.25$ tons/ac.
4. N means at the same level of F $= 0.14$ tons/ac. S.E. of body of T x F table $= 0.28$ tons/ac.

Crop :- Maize fodder (Kharif).
Ref :- I.A.R.I. 55(30).
Type :- 'M'.

Object :- To study the effect of soil need fertilizer on Maize fodder.

1. BASAL CONDITIONS :
(i) and (ii) N.A. (iii) 12.6.1955. (iv) (a) 3 ploughings and 2 sodahus. (b) to (e) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 4 and 5.9.1955.

2. TREATMENTS :
5 manurial treatments : T₀ = No manure (control), T₁ = Soil need fertilizer (30 lb./ac. of N+8.8 lb./ac. of P₀₂O₅+21.3 lb./ac. of K₂O). T₁ = 30 lb./ac. of N as A₅, T₂ = T₁+23.8 lb./ac. of P₀₂O₅ as triple Super and T₃=T₂+21.3 lb./ac. of K₂O as Pot. Sul.

3. DESIGN :
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 28' x 24'. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Normal. (ii) Nil. (iii) Fodder yield. (iv) (a) 1955-1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
(i) 9.75 tons/ac. (ii) 1.52 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.
Treatment
<table>
<thead>
<tr>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.76</td>
<td>11.22</td>
<td>9.60</td>
<td>9.85</td>
<td>10.33</td>
</tr>
</tbody>
</table>
S.E. mean $= 0.62$ tons/ac.

Crop :- Maize fodder (Kharif).
Ref :- I.A.R.I. 56(43).
Type :- 'M'.

Object :- To study the effect of soil need fertilizer on Maize fodder.

1. BASAL CONDITIONS :
(i) and (ii) N.A. (iii) 26.7.1956. (iv) (a) Discing twice and grubbing four times. (b) Sown by drill. (c) 16 hrs/ac. (d) and (e) N.A. (v) N.A. (vi) Yellow no. 2. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 3.10.1956.

2. TREATMENTS and 3. DESIGN :
Same as in exp. no. 55(30) above.

4. GENERAL :
(i) Stunted as the crop was sown late. (ii) Nil. (iii) Fodder yield. (v) (a) 1955-1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
(i) 6.60 tons/ac. (ii) 2.18 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.
Crop :- Maize fodder (Kharif).

Object :- To study the effect of soil need fertilizer on Maize fodder.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 5.7.1957. (iv) (a) 1 ploughing by Victory plough and 2 ploughings by desi plough.
   (b) to (e) N.A. (vi) Yellow no. 2. (vii) Irrigated. (viii) and (ix) N.A. (x) 9 and 10.9.1957.

TREATMENTS and 3. DESIGN:
Same as in expt. no. 55(30) on page 459.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1955-1957. (b) Nil. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 7.23 tons/ac. (ii) 1.59 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Crop :- Maize fodder (Kharif).

Object :- To study the relative value of different phosphatic fertilizers for Maize fodder.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) 3 to 6.6.1955. (iv) (a) 1 Victory ploughing and 3 desi ploughings. (b) to (e) N.A. (vi) Nil. (vii) Irrigated. (viii) and (ix) N.A. (x) 18 to 22.8.1955.

2. TREATMENTS:
   12 sources of 100 lb./ac. of P2O5 : S0=Control (no P2O5), S1=Rock phosph. S2=¼ as Super+¼ as Rock phos., S3=Super, S4=Farm B.M. (residual effect), S5=Powder Farm S6=Farm B.M. grade I (residual effect), S7=Farm B.M. grade II, S8=Farm B.M. grade III, S9=Trichy nodules, S10=¼ as trichy nodules+¼ as Super and S11=Super (only 50 lb./ac. of P2O5).

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 27'x20'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1955—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 8.17 tons/ac. (ii) 2.68 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.
Crop - Maize fodder (Kharif).
Type - 'M'.

Object: - To study the relative value of different phosphatic fertilizers for Maize fodder.

1. BASAL CONDITIONS:
   (i) (a) No. and (b) N.A. (ii) (a) and (b) N.A. (iii) 10 and 12.6.1955. (iv) (a) 1 Victory ploughing and 1 desi ploughing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 24 to 28.8.1956.

2. TREATMENTS to 4. GENERAL:
   Same as in expt no. 55(31) on page 460.

5. RESULTS:
   (i) 8.16 tons/ac. (ii) 1.43 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Crop - Maize fodder (Kharif).
Ref - I.A.R.I. 54(39).
Type - 'M'.

Object: - To study the effect of different levels of N as A/S and F.Y.M. on the yield of Maize Fodder.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) 24 and 25.7.1954. (iv) (a) 2 ploughings with desi plough and 1 ploughing with Victory plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (viii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 28.9.1954 to 4.10.1954.

2. TREATMENTS:
   12 manurial treatments: T₀ = No manure, T₁ = 40 lb./ac. of N as F.Y.M., T₂ = 80 lb./ac. of N as F.Y.M., T₃ = 120 lb./ac. of N as F.Y.M., T₄ = 20 lb./ac. of N as A/S, T₅ = 40 lb./ac. of N as A/S, T₆ = 60 lb./ac. of N as A/S, T₇ = 20 lb./ac. of N as A/S, T₈ = 40 lb./ac. of N as A/S, T₉ = 60 lb./ac. of N as A/S, T₁₀ = 80 lb./ac. of N as F.Y.M. + 40 lb./ac. of N as A/S, T₁₁ = 120 lb./ac. of N as F.Y.M. + 40 lb./ac. of N as A/S, F.Y.M. applied 8 weeks before sowing. A/S applied 1/2 at sowing + 1/2 at first irrigation.

3. DESIGN:
   (i) R.B.D. (ii) 12. (b) N.A. (iii) 8. (iv) (a) 24' x 34.5'. (b) 22' x 33'. (v) 1' x 9'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1953-1956. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 6.22 tons/ac. (ii) 1.42 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.
Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ | T₆ | T₇ | T₈ | T₉ | T₁₀ | T₁₁
---|---|---|---|---|---|---|---|---|---|---|---|---
Av. yield | 5.66 | 6.90 | 6.66 | 6.88 | 6.03 | 5.69 | 5.40 | 5.66 | 6.68 | 6.05 | 6.75 | 7.13
S.E./mean = 0.50 tons/ac.

Crop → Maize fodder (Kharif).  
Ref → I.A.R.I. 55(32).  
Type → 'M'.

Object:—To study the effect of different levels of N as A/S and F.Y.M. on the yield of Maize Fodder.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 16 and 17.6.1955. (iv) (a) 1 Victory ploughing, 2 desi ploughings and harrowing. (b) to (e) N.A. (v) N.A. (vi) Yellow no. 2. (vii) Irrigated. (viii) 2 hoeings and 1 weeding. (ix) N.A. (x) 6 to 8.9.1955.

2. TREATMENTS:
   Same as in expt. no. 54(39) on page 461.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) and (b) 22'×33'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1953—1956. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 4.07 tons/ac. (ii) 1.05 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in lb./ac.

   Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ | T₆ | T₇ | T₈ | T₉ | T₁₀ | T₁₁
---|---|---|---|---|---|---|---|---|---|---|---|---
Av. yield | 3.72 | 3.73 | 4.14 | 4.05 | 3.71 | 4.72 | 4.04 | 4.12 | 3.85 | 4.14 | 3.78 | 4.87
S.E./mean = 0.37 tons/ac.

Crop → Maize fodder (Kharif).  
Ref → I.A.R.I. 56(47).  
Type → 'M'.

Object:—To study the effect of different levels of N as A/S and F.Y.M. on the yield of Maize Fodder.

1. BASAL CONDITIONS:
   (i) (a) Maize Wheat—Maize. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 17 and 18.7.1956. (iv) (a) 1 double tractor grubbing and 1 double tractor discing. (b) By kver. (c) to (e) N.A. (v) N.A. (vi) Yellow no. 2. (vii) Irrigated. (viii) to (v) N.A.

2. TREATMENTS:
   Same as in expt. no. 54(39) on page 461.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) and (b) 22'×33'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1953—1956. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2.87 tons/ac. (ii) 1.26 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.
Treatment | T_1 | T_2 | T_3 | T_4 | T_5 | T_6 | T_7 | T_8 | T_9 | T_{10} | T_{11}  
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---  
Av. yield | 2.21 | 2.51 | 3.41 | 2.98 | 2.71 | 2.91 | 3.21 | 3.53 | 1.52 | 3.28 | 2.44 | 3.43
S.E./mean = 0.44 tons/ac.

Crop ➔ Maize fodder (Kharif).  
Ref ➔ I.A.R.I. 54(40).  
Site ➔ Bot. Sub-stn., Pusa.  
Type ➔ 'M'.

Object:— To study the effect of N and P through different sources on the yield of Maize fodder.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 17.6.1954. (iv) (a) 2 ploughings with Empire plough and 1 desi ploughing. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 3 hoings and 3 thinnings. (ix) 34.71'. (x) 28.9.1954.

2. TREATMENTS:
   10 manurial treatments: M_0 = Control, M_1 = 8000 lb./ac. of F.Y.M., M_2 = 20 lb./ac. of N as Rape cake, M_3 = 25 lb./ac. of K_2O as Pot. Sul., M_4 = 40 lb./ac. of P_2O_5 as Super, M_5 = 20 lb./ac. of N as A/S, M_6 = 25 lb./ac. of K_2O as Pot. Sul. + 40 lb./ac. of P_2O_5 as Super, M_7 = 20 lb./ac. of N as A/S + 25 lb./ac. of K_2O as Pot. Sul. + 40 lb./ac. of P_2O_5 as Super, M_8 = 20 lb./ac. of N as A/S + 40 lb./ac. of P_2O_5 as Super and M_9 = 20 lb./ac. of N as A/S + 25 lb./ac. of K_2O as Pot. Sul.

3. DESIGN:
   (i) R.B.D. (ii) 10. (b) N.A. (iii) 9. (iv) (a) 44'×24'. (b) 37.5'×18'. (v) 3'3'×3'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Attack of top and stem borers. (iii) Fodder yield. (iv) (a) 1930—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 4.09 tons/ac. (ii) 0.15 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.
   Treatment | M_0 | M_1 | M_2 | M_3 | M_4 | M_5 | M_6 | M_7 | M_8 | M_9
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---  
S.E./mean = 0.05 tons/ac.

Crop ➔ Maize fodder (Rabi).  
Ref ➔ I.A.R.I. 54(41).  
Type ➔ 'CM'.

Object:— To study the effect of different levels of P and the number of cuttings on the yields of Maize fodder and its residual effect on soil fertility as judged by the following Maize crop.

1. BASAL CONDITIONS:
   (i) (a) and (b) Maize. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 31.1.1954. (iv) (a) 1 ploughing by Victory plough and 1 desi plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing and 2 weedings. (ix) N.A. (x) 22.3.1955 for C_4 and 12.2.1955, 25.3.1955 for C_5.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of P_2O_5: P_0 =0, P_1 =40, P_2 =80 and P_3 =120 lb./ac.
   (2) 2 levels of cutting: C_1 =1 cutting and C_2 =2 cuttings.
3. DESIGN:
(i) R.B.D. (ii) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 1/8 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of maize fodder. (iv) (a) 1933—N.A. (b) Yes. (c) Nil. (d) and (b) No. (v) and (vi) Nil.

5. RESULTS:
(i) 6.74 tons/ac. (ii) 0.50 tons/ac. (iii) Main effect of P is significant, main effect of C is highly significant while interaction is not significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>6.50</td>
<td>7.23</td>
<td>7.11</td>
<td>7.36</td>
<td>7.05</td>
</tr>
<tr>
<td>C2</td>
<td>6.05</td>
<td>6.14</td>
<td>6.98</td>
<td>6.51</td>
<td>6.42</td>
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<tr>
<td>Mean</td>
<td>6.28</td>
<td>6.68</td>
<td>7.04</td>
<td>6.94</td>
<td>6.74</td>
</tr>
</tbody>
</table>

S.E. of P marginal mean = 0.18 tons/ac.
S.E. of C marginal mean = 0.12 tons/ac.
S.E. of body of table = 0.25 tons/ac.

Crop :- Berseem (Rabi.)
Type :- 'M'.

Object :- To study the effect of P on berseem yield rotated with cowpea for three years and further to study the residual effect of fertilizer on wheat in (i) cowpea—wheat and (ii) fallow—wheat rotations.

1. BASAL CONDITIONS:
(i) (a) Cowpea—Wheat and Fallow—Wheat. (b) Cowpea. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 20 and 21.11.1954. (iv) (a) Ploughings and hand hoeing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Weeding on 18.1.1955 to 31.1.1955. (ix) N.A. (x) 6 to 11.6.1955.

2. TREATMENTS:
13 manurial treatments:
M0=Control, M1=16 lb./ac. of P2O5 as F.Y.M., M2=32 lb./ac. of P2O5 as F.Y.M., M3=64 lb./ac. of P2O5 as F.Y.M., M4=16 lb./ac. of P2O5 as Super, M5=32 lb./ac. of P2O5 as Super, M6=64 lb./ac. of P2O5 as Super, M7=8 lb./ac. of P2O5 as Super, M8=8 lb./ac. of P2O5 as Super, M9=8 lb./ac. of P2O5 as Super, M10=8 lb./ac. of P2O5 as Super, M11=8 lb./ac. of P2O5 as Super, M12=8 lb./ac. of P2O5 as Super, M13=8 lb./ac. of P2O5 as Super and M14=No berseem crop.

3. DESIGN:
(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) 63’ x 17’. (b) 63’ x 15’. (v) 1’ on each side. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1954—1956 (treatments changed in 1955 and 1956). (b) Yes. (c) No. (d) and (b) N.A. (v) and (vi) Nil.

5. RESULTS:
Grain yield
(i) 494 lb./ac. (ii) 81.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
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<th>M10</th>
<th>M11</th>
<th>M12</th>
<th>M13</th>
<th>M14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>290</td>
<td>335</td>
<td>491</td>
<td>584</td>
<td>451</td>
<td>527</td>
<td>538</td>
<td>435</td>
<td>478</td>
<td>640</td>
<td>533</td>
<td>620</td>
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</tr>
</tbody>
</table>

S.E./mean = 33.1 lb./ac.
465

Fodder yield

(i) 12.36 tons/ac.  (ii) 2.79 tons/ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
<th>M₁₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>4.49</td>
<td>6.93</td>
<td>10.54</td>
<td>12.52</td>
<td>11.03</td>
<td>15.35</td>
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<td>7.28</td>
<td>10.78</td>
<td>17.04</td>
<td>13.05</td>
<td>17.68</td>
</tr>
</tbody>
</table>

S.E./mean = 1.14 tons/ac.

Crop: Berseem (Rabi).
Object: To study the effect of P on Berseem yield rotated with cowpea for 3 years and further to study the residual effect of fertilizers on wheat in cowpea-wheat and fallow-wheat rotations.

1. BASAL CONDITIONS:
   (i) (a) Berseem—Cowpea. (b) Cowpea. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 18 to 20.10.1955.
   (iv) (a) and (b) N.A. (c) 10 yrs./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Weedings. (ix) N.A. (x) 26.5.1956 to 9.6.1956.

2. TREATMENTS:
13 manurial treatments: M₀=Control (no manure), M₁=16 lb./ac. of P₂O₅ as F.Y.M., M₂=32 lb./ac. of P₂O₅ as F.Y.M., M₃=64 lb./ac. of P₂O₅ as Super, M₄=32 lb./ac. of P₂O₅ as Super, M₅=64 lb./ac. of P₂O₅ as Super, M₆=64 lb./ac. of P₂O₅ as Super+8 lb./ac. of P₂O₅ as F.Y.M., M₇=8 lb./ac. of P₂O₅ as Super+16 lb./ac. of P₂O₅ as F.Y.M., M₈=56 lb./ac. of P₂O₅ as Super+8 lb./ac. of P₂O₅ as F.Y.M., M₉=8 lb./ac. of P₂O₅ as Super+16 lb./ac. of P₂O₅ as F.Y.M., M₁₀=56 lb./ac. of P₂O₅ as Super+8 lb./ac. of P₂O₅ as F.Y.M., and M₁₁=No Berseem crop.

3. DESIGN:
   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) 65°×17°. (b) 63°×15°. (v) 1°×1°. (vi) Yes.

4. GENERAL:
   (i) Good. Lodging occurred. (ii) Nil. (iii) Nil. (iv) (a) 1954—1955 (treatments changed in 1955). (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 14.19 tons/ac. (ii) 2.06 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
<th>M₁₁</th>
</tr>
</thead>
</table>

S.E./mean = 0.84 tons/ac.

Crop: Berseem (Rabi).
Object: To study the effect of low doses of phosphates on the yield of Berseem.

1. BASAL CONDITIONS:
   (i) (a) Berseem—Cowpea. (b) Cowpea. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 17 and 18.10.1956. (iv) (a) 3 Victory ploughings and 3 desl ploughings. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 12 and 13.6.1957.
2. TREATMENTS:
Same as in exp. no. 54(42) on page 464.

3. DESIGN:
(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 65' x 17'c. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) No. (iii) Yield of fodder and seed. (iv) (a) 1954—1956 (treatments slightly changed in 1955). (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

Fodder yield
(i) 9.72 tons/ac. (ii) 2.26 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>( M_4 )</th>
<th>( M_5 )</th>
<th>( M_6 )</th>
<th>( M_7 )</th>
<th>( M_8 )</th>
<th>( M_9 )</th>
<th>( M_{10} )</th>
<th>( M_{11} )</th>
<th>( M_{12} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2.99</td>
<td>5.18</td>
<td>11.13</td>
<td>12.68</td>
<td>6.93</td>
<td>8.85</td>
<td>13.89</td>
<td>6.76</td>
<td>10.15</td>
<td>13.01</td>
<td>10.83</td>
<td>15.06</td>
<td>10.15</td>
</tr>
<tr>
<td>S.E./ mean</td>
<td>0.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Seed yield
(i) 251 lb/ac. (ii) 264.1 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of seed in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>( M_4 )</th>
<th>( M_5 )</th>
<th>( M_6 )</th>
<th>( M_7 )</th>
<th>( M_8 )</th>
<th>( M_9 )</th>
<th>( M_{10} )</th>
<th>( M_{11} )</th>
<th>( M_{12} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>66</td>
<td>165</td>
<td>261</td>
<td>297</td>
<td>238</td>
<td>287</td>
<td>355</td>
<td>189</td>
<td>279</td>
<td>297</td>
<td>285</td>
<td>294</td>
<td></td>
</tr>
<tr>
<td>S.E./ mean</td>
<td>26.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Crop: Berseem (Kharif).
Object: To study the relative value of different phosphates.

Ref: I.A.R.I. 54(43).
Type: 'M'.
Crop: Berseem (Rabi).

Object: To study the relative value of different phosphates.

1. BASAL CONDITIONS:
   (i) to (iv) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 54(43) on page 466.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) 28.5' x 21.5'. (b) 27' x 20'. (v) 9' x 9'. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of fodder. (iv) (a) 1953—contd. (b) Yes. (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 21.06 tons/ac. (ii) 4.00 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
<th>M₁₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>8.21</td>
<td>7.69</td>
<td>7.58</td>
<td>7.63</td>
<td>8.58</td>
<td>8.85</td>
<td>8.47</td>
<td>6.89</td>
<td>8.73</td>
<td>8.14</td>
<td>9.09</td>
<td>7.46</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.87 tons/a.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Crop: Berseem (Rabi).

Object: To study the relative value of different phosphates.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 28.10.1955. (iv) (a) Victory ploughing once, bullock discing thrice and desi ploughing once. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 54(43) on page 466.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 27' x 20'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1953—contd. (b) Yes. (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) 13.42 tons/ac. (ii) 2.65 tons/ac. (iii) Treatment differences are highly significant. (iv) Avg. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
<th>M₁₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>10.41</td>
<td>11.18</td>
<td>17.94</td>
<td>15.26</td>
<td>11.39</td>
<td>10.84</td>
<td>13.62</td>
<td>18.08</td>
<td>17.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.18 tons/ac.</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Site: Indian Agri Res. Instt., New Delhi. Type: 'M'.

Object: To study the effect of different fertilizers on the yield of Berseem and the residual effect of those on the succeeding crops in rotation.

1. BASAL CONDITIONS:

(i) and (ii) N.A. (iii) 22 and 23.10.1937. (iv) (a) 4 tractor grubblings, 1 ploughing with Victory plough and 1 tractor digging. (b) to (e) N.A. (v) to (ix) N.A. (x) 5 harvestings from 13.12.1957 to 18.4.1958.

2. TREATMENTS:

8 manurial treatments: T₀ =Control, T₁ =120 lb./ac. of P₂O₅, T₂ =T₁ +120 lb./ac. of K₂O, T₃ =T₁ +100 lb./ac. of N, T₄ =T₁ +25 lb./ac. of N, T₅ =T₁ +50 lb./ac. of N, T₆ =T₁ +100 lb./ac. of N and T₇ =Fallow.

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 36' x 18'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) to (vii) N.A.

5. RESULTS:

Series I

(i) 12.84 tons/ac. (ii) 2.12 tons/ac. (iii) Treatment differences are highly significant. (iv) Avg. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
</tr>
</thead>
</table>

Series II

(ij) 21.70 tons/ac. (ii) 2.17 tons/ac. (iii) Treatment differences are highly significant. (iv) Avg. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>10.94</td>
<td>24.58</td>
<td>23.22</td>
<td>23.35</td>
<td>22.95</td>
<td>23.78</td>
<td>23.05</td>
<td>8.84 tons/ac.</td>
</tr>
</tbody>
</table>


Object: To study the effect of P on Berseem with and without K and N and its residual effect on maize, cotton and wheat.
1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 3 and 4,11,1958. (iv) (a) 4 tractor grubblings, 1 ploughing with zirphali and 1 tractor discing. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 4 harvests from 7.1,1959 to 9.4,1959.

2. TREATMENTS:
7 manurial treatments: M₀—Control (2 plots), M₁ = 120 lb./ac. of P₂O₅, M₂ = M₁ + 120 lb./ac. of K₂O, M₃ = M₁ + 100 lb./ac. of N, M₄ = M₁ + 25 lb./ac. of N, M₅ = M₁ + 50 lb./ac. of N and M₆ = M₅ + 100 lb./ac. of N.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 36' x 18'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1948—N.A. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
Series I
(i) 7.24 tons/ac. (ii) 1.54 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>6.74</td>
<td>6.76</td>
<td>7.36</td>
<td>8.03</td>
<td>8.43</td>
<td>6.69</td>
<td>7.18</td>
</tr>
<tr>
<td>S.E./mean other than M₀</td>
<td>= 0.63 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean for M₀</td>
<td>= 0.44 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Series II
(i) 13.09 tons/ac. (ii) 1.95 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>8.30</td>
<td>15.12</td>
<td>15.96</td>
<td>13.46</td>
<td>14.05</td>
<td>14.22</td>
<td>15.23</td>
</tr>
<tr>
<td>S.E./mean other than M₄</td>
<td>= 0.79 ton/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean for M₄</td>
<td>= 0.56 ton/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Crop: Berseem (Kharif).
Object: To study the effect of low doses of P on Berseem fodder and after effects on wheat.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 2.6.1959. (iv) (a) 1 Victory ploughing and 2 tractor discings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 weed mg. (ix) N.A. (x) 27 to 29.8.1959.

2. TREATMENTS:
13 manurial treatments: M₀—Control, M₁—Fallow in rabi, M₂—16 lb./ac. of P₂O₅ as F.Y.M., M₃—32 lb./ac. of P₂O₅ as F.Y.M., M₄—64 lb./ac. of F.Y.M., M₅—16 lb./ac. of P₂O₅ as Super, M₆—32 lb./ac. of P₂O₅ as Super, M₇—8 lb./ac. of P₂O₅ as Super+8 lb./ac. of P₂O₅ as F.Y.M., M₈—8 lb./ac. of P₂O₅ as Super+24 lb./ac. of P₂O₅ as F.Y.M., M₉—8 lb./ac. of P₂O₅ as Super+24 lb./ac. of P₂O₅ as Super+24 lb./ac. of P₂O₅ as Super+24 lb./ac. of P₂O₅ as Super+24 lb./ac. of P₂O₅ as Super.

3. DESIGN:
(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) 63' x 17'. (b) 63' x 15'. (v) N.A. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A.  (iii) Yield of fodder.  (iv) (a) 1959—N.A.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 5.67 tons/ac.  (ii) 1.38 t tons/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>4.58</td>
<td>4.0</td>
<td>4.77</td>
<td>6.57</td>
<td>5.36</td>
<td>6.13</td>
<td>5.86</td>
</tr>
<tr>
<td>Treatment</td>
<td>M₇</td>
<td>M₈</td>
<td>M₉</td>
<td>M₁₀</td>
<td>M₁₁</td>
<td>M₁₂</td>
<td></td>
</tr>
<tr>
<td>Av. yield</td>
<td>5.72</td>
<td>4.98</td>
<td>4.78</td>
<td>7.71</td>
<td>6.65</td>
<td>6.56</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 0.799 tons/ac.

Crop: Berseem.
Ref: I.A.R.I. 58(33).
Type: 'M'.
Object: To study the effect of soil and foliar application of micro-nutrient elements on the yield of Berseem fodder.

1. BASAL CONDITIONS:
(i) to (x) N.A.

2. TREATMENTS:
18 mineral treatments: M₁ = Control, M₂ = 60 lb./ac. of P₂O₅ as soil application, M₃ = 120 lb./ac. of P₂O₅ as soil application, M₄ = 40 lb./ac. of P₂O₅ as soil application + 20 lb./ac. of P₂O₅ as foliar spray, M₅ = 40 lb./ac. of P₂O₅ as soil application + 40 lb./ac. of P₂O₅ as foliar spray, M₆ = 40 lb./ac. of P₂O₅ as foliar spray, M₇ = M₁ + 1 lb./ac. of Mo as soil application, M₈ = M₁ + 1 lb./ac. of B as soil application, M₉ = M₁ + 2 lb./ac. of Zn as soil application, M₁₀ = M₁ + 1 lb./ac. of Mn as soil application, M₁₁ = M₁ + 1 lb./ac. of B as soil application, M₁₂ = M₁ + 2 lb./ac. of Mn as soil application, M₁₃ = M₁ + 1 lb./ac. of Zn as foliar spray, M₁₄ = M₂ + 1 lb./ac. of B as foliar spray, M₁₅ = M₆ + 1 lb./ac. of Mo as foliar spray, M₁₆ = M₈ + 1 lb./ac. of B as foliar spray, M₁₇ = M₉ + 1 lb./ac. of Mn as foliar spray, M₁₈ = M₁₀ + 1 lb./ac. of B as foliar spray, M₁₉ = M₁₁ + 1 lb./ac. of Mo as foliar spray, M₂₀ = M₁₂ + 1 lb./ac. of B as foliar spray, M₂₁ = M₁₃ + 1 lb./ac. of Mn as foliar spray, M₂₂ = M₁₄ + 1 lb./ac. of B as foliar spray, M₂₃ = M₁₅ + 1 lb./ac. of Mo as foliar spray, M₂₄ = M₁₆ + 1 lb./ac. of B as foliar spray,

3. DESIGN:
(i) R.B.D.  (ii) 18.  (b) N.A.  (iii) 4.  (iv) (a) 2²' x 19.5'.  (b) 25' x 17.5'.  (v) 1' x 1'.  (vi) Yes.

4. GENERAL:
(i) and (ii) N.A.  (iii) Fodder yield.  (iv) (a) 1958—1959 (treatments slightly changed in 1959).  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 29.63 tons/ac.  (ii) 3.15 tons/ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
<th>M₁₁</th>
<th>M₁₂</th>
<th>M₁₃</th>
<th>M₁₄</th>
<th>M₁₅</th>
<th>M₁₆</th>
<th>M₁₇</th>
<th>M₁₈</th>
<th>M₁₉</th>
<th>M₂₀</th>
<th>M₂₁</th>
<th>M₂₂</th>
<th>M₂₃</th>
<th>M₂₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>21.26</td>
<td>29.31</td>
<td>29.84</td>
<td>30.06</td>
<td>30.43</td>
<td>26.11</td>
<td>30.14</td>
<td>31.44</td>
<td>34.06</td>
<td>21.26</td>
<td>29.31</td>
<td>29.84</td>
<td>30.06</td>
<td>30.43</td>
<td>26.11</td>
<td>30.14</td>
<td>31.44</td>
<td>34.06</td>
<td>21.26</td>
<td>29.31</td>
<td>29.84</td>
<td>30.06</td>
<td>30.43</td>
<td>26.11</td>
<td>30.14</td>
</tr>
</tbody>
</table>

S.E./mean = 1.58 tons/ac.
Crop : Berseem (Rabi).
Object :- To study the effect of phosphobacterin inoculation on the yield of Berseem.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 4 and 5.11.1959. (iv) (a) 1 Victory ploughing, 1 ploughing with tripahi and 1 double discing with tractor. (b) to (e) N.A. (v) Irrigated. (vi) Nil. (vii) N.A. (viii) 1.2.1960 to 14.5.1960.

2. TREATMENTS:
   18 material treatments: M₀=Control, M₁=60 lb./ac. of P₂O₅ as soil application, M₂=120 lb./ac. of P₂O₅ as soil application, M₃=40 lb./ac. of P₂O₅ as soil application+20 lb./ac. of Zn as foliar spray, M₄=180 lb./ac. of P₂O₅ as soil application+40 lb./ac. of Zn as foliar spray, M₅=M₁+1 lb./ac. of Zn as soil application, M₆=M₂+1 lb./ac. of Zn as soil application, M₇=M₃+1 lb./ac. of Zn as soil application. M₈=M₁+1 lb./ac. of Zn as soil application, M₉=M₂+1 lb./ac. of Zn as soil application, M₁₀=M₃+1 lb./ac. of Zn as soil application.

3. DESIGN:
   (i) R.B.D. (ii) 4. (iii) 4. (iv) (a) 25'x21'. (b) 23'x19'. (v) Nil. (vi) Yes. (vii) Nil. (viii) Yes. (ix) Nil. (x) N.A.

4. RESULTS:
   (i) 26.28 tons/ac. (ii) 2.87 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of the treatments.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>24.43</td>
<td>26.18</td>
<td>26.58</td>
<td>26.92</td>
<td>29.16</td>
<td>22.75</td>
<td>22.71</td>
<td>22.29</td>
<td>28.11</td>
</tr>
</tbody>
</table>

S.E./mean = 1.66 tons/ac.
4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of fodder. (iv) (a) and (b) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 14.09 tons/ac. (ii) 1.94 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in tons/ac.

\[ F_0 = 12.83 \text{ tons/ac. and } F_1 = 14.76 \text{ tons/ac.} \]

<table>
<thead>
<tr>
<th></th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>C_0</td>
<td>12.84</td>
<td>14.76</td>
<td>13.44</td>
<td>13.68</td>
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<tr>
<td>C_1</td>
<td>14.52</td>
<td>14.96</td>
<td>14.63</td>
<td>14.70</td>
</tr>
</tbody>
</table>

\[ \text{S.E. of C marginal mean} = 0.46 \text{ tons/ac.} \]
\[ \text{S.E. of S marginal mean} = 0.56 \text{ tons/ac.} \]
\[ \text{S.E. of body of table or E mean} = 0.79 \text{ tons/ac.} \]

Object: To see the effect of phosphobacterin inoculation of Berseem seed and its effects on phosphorus availability.

1. BASAL CONDITIONS:

(i) and (ii) N.A. (iii) 18 and 19.10.1958. (iv) (a) Tractor discing 4 times. (b) to (e) N.A. (v) 30 lb./ac. of N as A/S. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 6 harvestings from 12.12.1958 to 10.5.1959.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 5 manural treatments: M_0=Control, M_1=30 lb./ac. of N as F.Y.M., M_2=M_1+60 lb./ac. of P_2O_5 as Super, M_3=M_1+60 lb./ac. of P_2O_5 as Rock phos. and M_4=M_1+60 lb./ac. of P_2O_5 as B.M.

(2) 4 cultural treatments: C_1=No bacterial culture, C_2=Phosphobacterin, C_3=Phospho. 24 and C_4=Indian culture.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 4. (iv) and (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Green fodder yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 16.81 tons/ac. (ii) 1.764 tons/ac. (iii) Main effects of M and C are highly significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>M_4</th>
<th>Mean</th>
</tr>
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<tr>
<td>C_0</td>
<td>30.69</td>
<td>34.12</td>
<td>38.80</td>
<td>34.95</td>
<td>35.70</td>
<td>34.85</td>
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<tr>
<td>C_1</td>
<td>38.62</td>
<td>39.05</td>
<td>43.54</td>
<td>39.67</td>
<td>39.16</td>
<td>40.01</td>
</tr>
<tr>
<td>C_2</td>
<td>35.33</td>
<td>34.94</td>
<td>38.48</td>
<td>36.32</td>
<td>36.22</td>
<td>36.26</td>
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<tr>
<td>C_3</td>
<td>34.58</td>
<td>35.40</td>
<td>38.74</td>
<td>35.67</td>
<td>35.75</td>
<td>36.11</td>
</tr>
<tr>
<td>Mean</td>
<td>34.90</td>
<td>35.88</td>
<td>39.89</td>
<td>36.65</td>
<td>36.71</td>
<td>36.81</td>
</tr>
</tbody>
</table>
Crop :- Berseem (Rabi).

Object :- To see phosphobacterin inoculation of Berseem seed and its effect on uptake of P.

1. BASAL CONDITIONS :
   (i) to (ix) N.A.
   (x) 3 harvestings from 21.1.1958 to 3.4.1958.

2. TREATMENTS :
   All combinations of (1) and (2)+2 extra treatments
   (1) 5 sources of 60 lb/ac. of P₂O₅: S₀=No P₂O₅, S₁=B.M., S₂=Rock, Phos., S₃=Super and S₄=F.Y.M.
   (2) 2 levels of fospho. : F₀=No fospho. 24 and F₁=Fospho. 24.
   Extra treatments : E₁=Phosphobacterin and E₂=Indian culture.

3. DESIGN :
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 3'X2'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) to (vii) Nil.

5. RESULTS :
   (i) 17.03 tons/ac. (ii) 1.94 tons/ac. (iii) E-effect is significant and interaction F×S is highly significant.
   (iv) Av. yield of fodder in tons/ac. E₁ = 16.12 tons/ac. and E₂ = 18.93 tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>P₀</td>
<td>17.20</td>
<td>15.92</td>
<td>16.24</td>
<td>20.07</td>
<td>16.86</td>
<td>17.26</td>
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<tr>
<td>P₁</td>
<td>16.27</td>
<td>16.60</td>
<td>16.57</td>
<td>16.02</td>
<td>17.75</td>
<td>16.60</td>
</tr>
<tr>
<td>Mean</td>
<td>16.73</td>
<td>16.26</td>
<td>16.30</td>
<td>18.04</td>
<td>17.30</td>
<td>16.93</td>
</tr>
</tbody>
</table>

S.E. of F marginal mean = 0.35 tons/ac.
S.E. of S marginal mean = 0.56 tons/ac.
S.E. of body of table or E mean = 0.79 tons/ac.

---

Crop :- Cowpea fodder (Kharif).

Object :- To study the residual effect of different levels and sources of P applied to previous berseem crop on Cowpea.

1. BASAL CONDITIONS :
   (i) (a) Berseem-Cowpea. (b) Berseem. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 15 and 16.7,1954.
   (iv) (a) 1 Victory ploughing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 20 to 26.9.1954.
2. TREATMENTS:

13 manurial treatments: $M_0$=Control (no manure), $M_1$=Fallow in previous season and no manure, $M_2$=16 lb/acre of $P_{2}O_{5}$ as F.Y.M., $M_3$=32 lb/acre of $P_{2}O_{5}$ as F.Y.M., $M_4$=64 lb/acre of $P_{2}O_{5}$ as Super, $M_5$=8 lb/acre of $P_{2}O_{5}$ as F.Y.M., $M_6$=16 lb/acre of $P_{2}O_{5}$ as Super, $M_7$=32 lb/acre of $P_{2}O_{5}$ as Super, $M_8$=64 lb/acre of $P_{2}O_{5}$ as Super, $M_9$=8 lb/acre of $P_{2}O_{5}$ as F.Y.M., $M_{10}$=8 lb/acre of $P_{2}O_{5}$ as Super, $M_{11}$=8 lb/acre of $P_{2}O_{5}$ as Super.

3. DESIGN:

(i) R.B.D. (ii) N.A. (iii) 6. (iv) (a) 65'x17', (b) 63'x15', (v) 1'x1'. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1918—N.A. (b) Yes. (c) Nil. (d) to (vii) Nil.

5. RESULTS:

(i) 7.68 tons/acre (ii) 2.59 tons/acre. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_0$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
<th>$M_5$</th>
<th>$M_6$</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>7.36</td>
<td>6.88</td>
<td>6.80</td>
<td>8.56</td>
<td>7.73</td>
<td>6.27</td>
<td>7.05</td>
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</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_7$</th>
<th>$M_8$</th>
<th>$M_9$</th>
<th>$M_{10}$</th>
<th>$M_{11}$</th>
<th>$M_{12}$</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>9.35</td>
<td>8.38</td>
<td>5.71</td>
<td>10.28</td>
<td>7.05</td>
<td>8.39</td>
</tr>
</tbody>
</table>

S.E./mean = 1.02 tons/acre.

---

Crop :- Cowpea fodder (Kharif).  
Object :- To study the residual effect of different levels and sources of $P$ applied to previous berseem crop on Cowpea.

1. BASAL CONDITIONS:

(i) (a) Berseem—Cowpea. (b) Berseem. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 27.6.1955. (iv) (a) 2 Victory ploughings and 1 bullock discing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing and 2 weedings. (ix) N.A. (x) 10 to 16.9.1955.

2. TREATMENTS to 4. GENERAL:

Same as in exp't. no. 54(45) on page 473.

5. RESULTS:

(i) 5.56 tons/acre (ii) 0.69 tons/acre. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_0$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
<th>$M_5$</th>
<th>$M_6$</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>4.87</td>
<td>5.69</td>
<td>5.51</td>
<td>6.05</td>
<td>5.91</td>
<td>5.37</td>
<td>5.35</td>
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<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_7$</th>
<th>$M_8$</th>
<th>$M_9$</th>
<th>$M_{10}$</th>
<th>$M_{11}$</th>
<th>$M_{12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>5.58</td>
<td>5.63</td>
<td>5.34</td>
<td>5.74</td>
<td>5.77</td>
<td>5.46</td>
</tr>
</tbody>
</table>

S.E./mean = 0.28 tons/acre.

---

Crop :- Cowpea fodder (Kharif).  
Object :- To study the effect of different levels and sources of $P$ applied to previous berseem crop on Cowpea.
1. BASAL CONDITIONS:
(i) (a) Barseem—Cowpea. (b) Barseem. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 23 to 25.6.1956. (iv) (a) and (b) N.A. (c) 20 as/acre. (d) and (e) N.A. (v) Nil. (vi) K—397. (vii) Irrigated. (viii) and (ix) N.A. (x) 3 to 7.9.1956.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 54(45) on page 473.

5. RESULTS:
(i) 4.26 tons/acre. (ii) 0.69 tons/acre. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>3.25</td>
<td>4.66</td>
<td>3.42</td>
<td>4.33</td>
<td>4.65</td>
<td>3.99</td>
<td>3.73</td>
<td></td>
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</table>

<table>
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<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>4.75</td>
<td>3.71</td>
<td>4.60</td>
<td>5.15</td>
<td>4.37</td>
<td>4.76</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 0.28 tons/acre.

Crop :- Cowpea fodder (Kharif),
Object :- To study the residual effect of different levels and sources of P applied to previous barseem crop on Cowpea.

1. BASAL CONDITIONS:
(i) (a) Barseem—Cowpea. (b) Barseem. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 11.7.1957. (iv) (a) 3 ploughings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 9 to 11.10.1957.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 54(45) on page 473.

5. RESULTS:
(i) 3.23 tons/acre. (ii) 1.10 tons/acre. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>2.36</td>
<td>2.95</td>
<td>2.33</td>
<td>3.58</td>
<td>4.55</td>
<td>2.44</td>
<td>3.15</td>
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<table>
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<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>4.22</td>
<td>2.52</td>
<td>2.84</td>
<td>4.42</td>
<td>3.57</td>
<td>3.07</td>
<td></td>
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</tr>
</tbody>
</table>

S.E./mean = 0.45 tons/acre.
2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 54(45) on page 473.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1948—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 5.61 tons/acre. (ii) 1.22 tons/acre. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>4.55</td>
<td>5.72</td>
<td>3.92</td>
<td>6.55</td>
<td>5.55</td>
<td>6.07</td>
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<table>
<thead>
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<th>Treatment</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>5.47</td>
<td>5.53</td>
<td>4.62</td>
<td>7.47</td>
<td>6.39</td>
<td>5.19</td>
</tr>
</tbody>
</table>

S.E./mean = 0.70 tons/acre.

Crop :- Guar fodder (Kharif).


Ref :- I.A.R.I. 57(57).

Type :- ‘M’.

Object :-To study the effect of different levels of P on Guar in Guar—Wheat rotation.

1. BASAL CONDITIONS:

(i) (a) As per treatments. (b) and (c) N.A. (ii) to (vii) N.A. (viii) Irrigated. (ix) and (x) N.A.

2. TREATMENTS:

12 manurial treatments with crop rotations: T₁=Guar—Wheat, T₂=Guar with 25 lb./ac. of P₂O₅ to guar crop, T₃=Guar with 50 lb./ac. of P₂O₅ to guar crop, T₄=Guar with 75 lb./ac. of P₂O₅ to guar crop, T₅=Guar with 20 lb./ac. of N to wheat, T₆=Guar with 25 lb./ac. of P₂O₅—wheat with 20 lb./ac. of N, T₇=Guar with 50 lb./ac. of P₂O₅—wheat with 20 lb./ac. of N, T₈=Guar with 75 lb./ac. of P₂O₅—wheat with 20 lb./ac. of N, T₉=Fallow—wheat (2 plots), T₁₀=Fallow—wheat with 20 lb./ac. of N and T₁₁=Fallow—wheat with 20 lb./ac. of N+25 lb./ac. of P₂O₅.

3. DESIGN:

(i) R.B.D. (ii) 12. (effective plots are 8 for guar crop). (b) N.A. (iii) 6. (iv) (a) 26’×22’. (b) 24’×20’. (v) 1’×1’. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1957—N.A. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) As 1957 is the starting year of the expt., the effective treatments for guar crop become 4 each in two plots in each replication.

5. RESULTS:

(i) 2.05 tons/acre. (ii) 0.38 tons/acre. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>(T₁+T₂)</th>
<th>(T₃+T₄)</th>
<th>(T₅+T₆)</th>
<th>(T₇+T₈)</th>
<th>(T₉+T₁₀)</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1.65</td>
<td>2.13</td>
<td>1.96</td>
<td>2.46</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 0.11 tons/acre.

Crop :- Guar fodder (Kharif).


Ref :- I.A.R.I. 58(56).

Type :- ‘M’.

Object :-To study the effect of different levels of P on Guar in Guar—Wheat rotation.
1. BASAL CONDITIONS:
(i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 19.7.1958. (iv) (a) 3 ploughings and 1 harrowing. (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 3 weedicings. (ix) N.A. (x) 25.9.1958.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 57(57) on page 476.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1957—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2.64 tons/ac. (ii) 0.38 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2.15</td>
<td>2.54</td>
<td>2.71</td>
<td>2.85</td>
<td>2.09</td>
<td>2.75</td>
<td>2.99</td>
<td>3.05</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 0.16 tons/ac.</td>
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<td></td>
<td></td>
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</table>

Crop :— Guar fodder (Kharif).
Type :—‘M’.

Object :-To study the effect of different levels of P on Guar in Guar—Wheat rotation.

1. BASAL CONDITIONS:
(i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 11.7.1959. (iv) (a) 2 Victory and 3 desi ploughings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 21 and 22 9.1959.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 57(57) on page 476.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1957—N.A. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2.08 tons/ac. (ii) 0.47 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1.70</td>
<td>2.28</td>
<td>2.33</td>
<td>2.31</td>
<td>1.60</td>
<td>2.06</td>
<td>2.07</td>
<td>2.31</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 0.19 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :— Jowar fodder (Kharif).
Type :—‘M’.

Object :-To study the effect of different levels and sources of N on Jowar.

1. BASAL CONDITIONS:
(i) to (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2) + a control
(1) 3 levels of N : N1 = 40, N2 = 80 and N3 = 120 lb./ac.
(2) 4 sources of N : S1 = A/S, S2 = A/N, S3 = Urea and S4 = Nitro magnesia.
3. DESIGN:
(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 27' x 20'. (v) N.A. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A. (iii) Yield of fodder. (iv) to (vii) N.A.
5. RESULTS:
(i) 7.02 tons/ac. (ii) 0.44 tons/ac. (iii) 'Control vs. others' and main effect of N are highly significant. (iv)
Av. yield of fodder in tons/ac.

Site :- Indian Agri. Res. Instit., New Delhi. Type :- 'M'.
Object :- To study the effect of different levels of P on the yield of Grass fodder.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 28.8.1959. (iv) (a) 1 Victory ploughing and 3 desi ploughings. (b) to (e) N.A.
(v) and (vi) N.A. (vii) Unirrigated. (viii) 1 hoeing. (i) N.A. (x) 4.11.1959.

2. TREATMENTS:
4 levels of P_2O_5 : P_0 =0, P_1 =30, P_2 =60 and P_3 =90 lb/ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 24' x 50'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Fodder yield. (iv) (a) 1958-1959. (b) No. (c) Nil. (v) (a) and (b) N.A.
(vi) Nil. (vii) Experiment was conducted at Todapur.

5. RESULTS:
(i) 22.96 tons/ac. (ii) 1.17 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder
in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P_0</th>
<th>P_1</th>
<th>P_2</th>
<th>P_3</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>22.23</td>
<td>23.50</td>
<td>22.74</td>
<td>23.39</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 0.48 tons/ac.

Site :- Indian Agri. Res. Instit., New Delhi. Type :- 'M'.
Object :- To study the effect of different levels of P on the yield of Grass fodder.
BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) to (vi) N.A. (vii) Irrigated. (viii) 3 hoeings with desi hoe and 3 weedings. (ix) N.A. (x) 22.7.1959 to 23.3.1960.

TREATMENTS:
4 levels of P₂O₅ as Super: P₁=0, P₂=60, P₃=120 and P₄=180 lb./ac.

DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 1/72 ac. (v) Nil. (vi) Yes.

GENERAL:
(i) Normal. (ii) Attack of leaf hopper. (iii) Yield of grass fodder. (iv) (a) 1958—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Whole of the area was water lodged during rains.

RESULTS:
(i) 15.95 tons/ac. (ii) 1.07 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>16.09</td>
<td>15.88</td>
<td>15.66</td>
<td>16.16</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.44 tons/ac.</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Crop: Grasses.

Object: To study the effect of different levels of N, P and K on different Grasses.

1. BASAL CONDITIONS:
   (i) to (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 3 hoeings, 2 weedicings, and gap filling.

2. TREATMENTS:
   All combinations (1), (2), (3) and (4)
   (1) 3 grasses: \( G_1 = \text{Chloris gayana}, G_2 = \text{Panicum maximum} \) and \( G_3 = \text{Urochloa mosambikensil} \).
   (2) 3 levels of N as A/S: N\_0 =0, N\_1 =40 and N\_2 =80 lb/ac.
   (3) 3 levels of P\_2\_0 as Super: P\_0 =0, P\_1 =30 and P\_2 =60 lb/ac.
   (4) 3 levels of K\_2\_o as Pot. Sul.: K\_0 =0, K\_1 =30 and K\_2 =60 lb/ac.

3. DESIGN:
   (i) 3 confd. (ii) (a) 9 plots/block and 9 block/replication. (b) N.A. (iii) 2. (iv) (a) and (b) 12'x50'.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of grass.

5. RESULTS:
   (i) 11.95 tons/ac. (ii) 2.46 tons/ac. (iii) Main effect of G is highly significant, and interaction G\_xK is significant. (iv) A\_\_ yield of grass in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>( K_0 )</th>
<th>( K_1 )</th>
<th>( K_2 )</th>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( G_1 )</td>
<td>7.71</td>
<td>8.39</td>
<td>8.91</td>
<td>8.69</td>
<td>8.31</td>
<td>8.01</td>
<td>7.84</td>
<td>8.66</td>
<td>8.52</td>
<td>8.34</td>
</tr>
<tr>
<td>( G_2 )</td>
<td>10.42</td>
<td>11.47</td>
<td>13.30</td>
<td>10.73</td>
<td>12.03</td>
<td>11.74</td>
<td>10.49</td>
<td>11.51</td>
<td>13.91</td>
<td>11.73</td>
</tr>
<tr>
<td>( G_3 )</td>
<td>15.90</td>
<td>16.42</td>
<td>15.05</td>
<td>16.30</td>
<td>15.97</td>
<td>14.99</td>
<td>15.82</td>
<td>16.05</td>
<td>15.49</td>
<td>15.79</td>
</tr>
<tr>
<td>Mean</td>
<td>11.34</td>
<td>12.09</td>
<td>12.42</td>
<td>11.97</td>
<td>12.31</td>
<td>11.58</td>
<td>11.38</td>
<td>12.07</td>
<td>12.40</td>
<td>11.95</td>
</tr>
<tr>
<td>( N_0 )</td>
<td>10.99</td>
<td>11.99</td>
<td>11.28</td>
<td>11.84</td>
<td>11.59</td>
<td>10.73</td>
<td>12.03</td>
<td>11.12</td>
<td>11.07</td>
<td></td>
</tr>
<tr>
<td>( N_1 )</td>
<td>10.69</td>
<td>12.33</td>
<td>13.19</td>
<td>12.03</td>
<td>13.12</td>
<td>11.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( N_2 )</td>
<td>12.45</td>
<td>11.97</td>
<td>12.79</td>
<td>12.03</td>
<td>12.21</td>
<td>12.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>( P_0 )</td>
<td>11.83</td>
<td>12.11</td>
<td>11.97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( P_1 )</td>
<td>10.83</td>
<td>12.62</td>
<td>13.47</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( P_2 )</td>
<td>11.37</td>
<td>11.55</td>
<td>11.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.53 tons/ac.
S.E. of body of any table = 0.58 tons/ac.

Crop: Grasses.

Object: To study the effect of different intervals of cutting and different levels of N on the yield of Grasses.
2. TREATMENTS:

All combinations of (1) and (2):
(1) 3 clipping intervals: C₁ = 20, C₂ = 30 and C₃ = 40 days.
(2) 4 levels of N : N₀ = 0, N₁ = 40, N₂ = 80 and N₃ = 120 lb/ac.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 34' x 16'. (b) 34' x 14'. (v) 1' either side length wise. (vi) Yes.

4. GENERAL:


5. RESULTS:

(i) 12.46 tons/ac. (ii) 0.79 tons/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>8.8</td>
<td>10.46</td>
<td>13.77</td>
<td>16.91</td>
<td>11.81</td>
<td>12.61</td>
</tr>
<tr>
<td>S.E. of N mean</td>
<td>= 0.23 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E. of C mean</td>
<td>= 0.20 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop => Grasses. 
Type => 'CM'.

Object => To study the effect of time of application of nitrogenous fertilizers on the yield of Grass.

1. BASAL CONDITIONS:


2. TREATMENTS:

All combinations of (1) and (2) + two extra treatments
(1) 4 levels of N : N₀ = 80, N₁ = 120, N₂ = 160 and N₃ = 200 lb/ac.
(2) 3 times of application : T₁ = After every cut, T₂ = After every two cuts and T₃ = After every three cuts.

Extra treatments : E₀ = Control and E₁ = 40 lb/ac. of P₂O₅.

3. DESIGN:

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 14' x 52'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of grass. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 31.93 tons/ac. (ii) 5.38 tons/ac. (iii) N effect is significant. Extra treatment vs. others' effect is highly significant. (iv) Av. yield of grass in tons/ac.

\[ E₀ = 26.13 \text{ tons/ac and } E₁ = 27.70 \text{ tons/ac} \]

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₁</td>
<td>29.82</td>
<td>29.98</td>
<td>30.37</td>
<td>39.67</td>
<td>32.46</td>
</tr>
<tr>
<td>T₂</td>
<td>30.66</td>
<td>34.15</td>
<td>27.40</td>
<td>36.15</td>
<td>32.09</td>
</tr>
<tr>
<td>T₃</td>
<td>33.23</td>
<td>31.48</td>
<td>32.25</td>
<td>37.03</td>
<td>33.10</td>
</tr>
<tr>
<td>Mean</td>
<td>31.24</td>
<td>31.87</td>
<td>32.01</td>
<td>37.62</td>
<td>32.18</td>
</tr>
</tbody>
</table>
Crop: Grasses.


Object: To study the effect of cuttings in association with levels of N on the yield of Grass.

1. BASAL CONDITIONS:
   (i) to (vi) N.A. (vii) Irrigated. (viii) 2 hoeings. (ix) N.A. (x) 10 cuttings from 24.4.1957 to 19.10.1957.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N as CMN: N₀ = 0, N₁ = 60, N₂ = 80 and N₃ = 120 lb./ac.
   (2) 3 intervals of cutting: C₁ = 20, C₂ = 30 and C₃ = 40 days.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) and (b) 1/30 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Poor. (ii) N.A. (iii) Yield of grass. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 6.94 tons/ac. (ii) 2.13 tons/ac. (iii) N x T and interaction N x C are highly significant. (iv) A x yield of grass in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C₁</td>
<td>3.08</td>
<td>8.31</td>
<td>9.68</td>
<td>7.37</td>
<td>7.16</td>
</tr>
<tr>
<td>C₂</td>
<td>4.72</td>
<td>4.02</td>
<td>11.23</td>
<td>9.67</td>
<td>7.41</td>
</tr>
<tr>
<td>C₃</td>
<td>5.77</td>
<td>4.41</td>
<td>5.19</td>
<td>9.62</td>
<td>6.25</td>
</tr>
<tr>
<td>Mean</td>
<td>4.52</td>
<td>5.58</td>
<td>8.77</td>
<td>8.89</td>
<td>6.94</td>
</tr>
</tbody>
</table>

S.E. of N marginal mean = 0.71 tons/ac.
S.E. of C marginal mean = 0.61 tons/ac.
S.E. of body of table = 1.23 tons/ac.

Crop: Grasses (Kharif & Rabi).


Object: To study the effect of different intervals of cutting in association with levels of N on the yield of Grass.

1. BASAL CONDITIONS:
   (i) to (vi) N.A. (vii) Irrigated. (viii) 1 weeding and 2 hoeings. (ix) N.A. (x) 8 cuttings from 24.4.1957 to 21.10.1957.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 57(59) above.

4. GENERAL:
   (i) Stand of crop was poor. (ii) N.A. (iii) Yield of grass. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS :
(i) 2.78 tons/ac. (ii) 0.48 tons/ac. (iii) All effects are highly significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>1.13</td>
<td>2.39</td>
<td>2.40</td>
<td>3.60</td>
<td>2.38</td>
</tr>
<tr>
<td>C2</td>
<td>1.35</td>
<td>1.68</td>
<td>2.77</td>
<td>5.01</td>
<td>2.70</td>
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<tr>
<td>C3</td>
<td>1.80</td>
<td>1.87</td>
<td>2.67</td>
<td>6.77</td>
<td>3.26</td>
</tr>
<tr>
<td>Mean</td>
<td>1.43</td>
<td>1.98</td>
<td>2.60</td>
<td>5.13</td>
<td>2.78</td>
</tr>
</tbody>
</table>

S.E. of N marginal mean = 0.16 tons/ac.
S.E. of C marginal mean = 0.11 tons/ac.
S.E. of body of table = 0.28 tons/ac.

Crop :- Grasses.

Ref :- I.A.R.I. 59(47).


Type :- 'CMV'.

Object :- To study the effect of N and intervals of cutting on the yield of different varieties of grasses.

1. BASAL CONDITIONS :
(i) to (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 3 cuttings and 2 weedings. (ix) N.A. (a) 18.4.1959 to 18.11.1959.

2. TREATMENTS :
All combinations of (1), (2) and (3)
(1) 3 varieties : V1 = S. Sphacelata, V2 = B. Mutica and V3 = P. Pseudum.
(2) 3 levels of N as A/S : N0 = 0, N1 = 80 and N2 = 160 lb/ac.
(3) 3 intervals of cutting : C1 = 30, C2 = 45 and C3 = 60 days.

3. DESIGN :
(i) 3^3 confd. (ii) (a) 9 plots/block ; 3 blocks/repslication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 48' x 12.5'.
(v) N.A. (vi) Yes.

4. GENERAL :
(i) Normal. (ii) Nil. (iii) Yield of grass. (iv) 1958—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
(i) 45.85 tons/ac. (ii) 4.81 tons/ac. (iii) Main effects of N, V and C and interaction N X V are highly significant. Interaction N X C is significant. (iv) Av. yield of grass in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>42.18</td>
<td>41.61</td>
<td>48.14</td>
<td>44.21</td>
<td>33.95</td>
</tr>
<tr>
<td>V2</td>
<td>23.36</td>
<td>37.13</td>
<td>42.10</td>
<td>34.20</td>
<td>25.52</td>
</tr>
<tr>
<td>V3</td>
<td>44.39</td>
<td>63.27</td>
<td>69.73</td>
<td>59.13</td>
<td>46.53</td>
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<tr>
<td>Mean</td>
<td>36.64</td>
<td>47.34</td>
<td>53.56</td>
<td>45.85</td>
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<table>
<thead>
<tr>
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<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>Mean</th>
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<td>C1</td>
<td>26.65</td>
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<tr>
<td>C2</td>
<td>40.87</td>
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<td>C3</td>
<td>40.41</td>
<td>56.13</td>
<td>61.42</td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 1.39 tons/ac.
S.E. of body of any table = 1.56 tons/ac.
Crop: Hubam Clover + Senji (Rabi).


Object: To study the response of Hubam Clover and Senji mixture in different proportions of P.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 11.11.1954. (iv) (a) 1 ploughing with desi plough. (b) to (e) N.A. (vi) Nil. (vii) N.A. (viii) Irrigated. (ix) 1 weeding. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 mixtures: 
   M₁ = Hubam clover alone, 
   M₂ = Senji alone, 
   M₃ = Hubam clover and senji in 1:1 ratio 
   and 
   M₄ = Hubam clover and senji in 3:2.
   (2) 3 levels of P₀: P₀ = 0, P₁ = 40 and P₂ = 80 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 0.5 acre. (b) N.A. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of grass. (iv) 1951—N.A. (b) Yes. (c) N.A. (v) to (vi) Nil.

5. RESULTS:
   (i) 9.97 tons/ac. (ii) 1.87 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in tons/ac,

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>11.27</td>
<td>7.04</td>
<td>9.25</td>
<td>11.37</td>
<td>9.73</td>
</tr>
<tr>
<td>P₁</td>
<td>10.76</td>
<td>7.19</td>
<td>8.84</td>
<td>12.02</td>
<td>9.70</td>
</tr>
<tr>
<td>P₂</td>
<td>10.49</td>
<td>9.23</td>
<td>11.00</td>
<td>11.19</td>
<td>10.48</td>
</tr>
<tr>
<td>Mean</td>
<td>10.84</td>
<td>7.82</td>
<td>9.70</td>
<td>11.53</td>
<td>9.97</td>
</tr>
</tbody>
</table>

S.E. of M marginal mean = 0.62 tons/ac.
S.E. of S marginal mean = 0.54 tons/ac.
S.E. of body of table = 1.08 tons/ac.

---

Crop: Linseed, Wheat and Gram (Rabi).


Object: To study the effect of mixed cropping of Linseed, Wheat and Gram on their yield.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 18.10.1954. (iv) (a) 2 ploughings and grubbing. (b) Line sowing. (c) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 7 weedings. (ix) N.A. (x) Wheat on 1, 6.4.1955, Gram and Linseed on 7, 9 to 11.4.1955.

2. TREATMENTS:
   9 proportions of mixture: 
   M₁ = Linseed alone, 
   M₂ = Wheat alone, 
   M₃ = Gram alone, 
   M₄ = Linseed + Gram in 2:1, 
   M₅ = Linseed + wheat in 2:1, 
   M₆ = Linseed + gram + wheat in 4:1:1, 
   M₇ = Linseed + gram + wheat in 1:1:1 and 

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 1/60 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:

I. Linseed yield

(i) 342 lb./ac. (ii) 209.0 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_1$</th>
<th>$M_4$</th>
<th>$M_5$</th>
<th>$M_6$</th>
<th>$M_7$</th>
<th>$M_8$</th>
<th>$M_9$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>792</td>
<td>485</td>
<td>189</td>
<td>270</td>
<td>309</td>
<td>172</td>
<td>179</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II. Wheat yield

(i) 1668 lb./ac. (ii) 711.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_1$</th>
<th>$M_4$</th>
<th>$M_5$</th>
<th>$M_6$</th>
<th>$M_7$</th>
<th>$M_8$</th>
<th>$M_9$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2187</td>
<td>1491</td>
<td>1203</td>
<td>2116</td>
<td>1344</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

III. Gram yield

(i) 1060 lb./ac. (ii) 281.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_1$</th>
<th>$M_4$</th>
<th>$M_5$</th>
<th>$M_6$</th>
<th>$M_7$</th>
<th>$M_8$</th>
<th>$M_9$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1689</td>
<td>1197</td>
<td>347</td>
<td>1377</td>
<td>689</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Crop:** Linseed, Wheat and Gram (Rainy).  
**Site:** Indian Agri. Res. Inst., New Delhi.  
**Type:** 'X'.  
**Ref:** I.A.R.I. 55(3).  
**Object:** To study the effect of mixed cropping of Linseed, Wheat and Gram on their yield.

1. BASAL CONDITIONS:
   (i) and (ii) N.A. (iii) 12.11.1955. (iv) (a) Discing twice and tractor grubbing twice. (b) Line sowing. (c) Linseed 10 lb./ac., wheat 75 lb./ac. and gram 36 lb./ac. (d) and (e) N.A. (v) Top dressing by C.N. (vi) N.A. (vii) Irrigated. (viii) 3 booms and 2 weedings. (ix) N.A. (x) 28.4.1956, 30.4.1956 and 1.5.1956.

2. TREATMENTS:
   Same as in exp. no. 54(47) on page 484.

3. DESIGN:
   (i) R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 40'X18'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952—N.A. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS:

1. Linseed yield

(i) 207 lb./ac. (ii) 46.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_1$</th>
<th>$M_4$</th>
<th>$M_5$</th>
<th>$M_6$</th>
<th>$M_7$</th>
<th>$M_8$</th>
<th>$M_9$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>485</td>
<td>324</td>
<td>74</td>
<td>91</td>
<td>313</td>
<td>66</td>
<td>58</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II Gram yield

(i) 250 lb./ac. (ii) 121.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.
Crop - Linseed, Wheat and Gram (Rabi).

Object: To study the effect of mixed cropping of Linseed with Wheat and Gram on their yield.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 6.11.1956. (iv) (a) Tractor ploughing, grubbing and discing. (b) Line sowing. (c) Linseed 10 lb./ac., wheat 75 lb./ac. and gram 32 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Linseed RR-197 (medium), wheat NP-760 (medium) and gram NP-58 (medium). (vii) Unirrigated. (viii) Weeding and hoeing. (ix) 5.59'. (x) 16.2.1957.

2. TREATMENTS:
   Same as in expt. no. 54(47) on page 484.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 42' x 20'. (b) 40' x 18'. (v) 1' x 1'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. Wheat lodged completely. (ii) Rust attack on wheat and wilt on gram. (iii) Growth and grain yield. (iv) (a) 1952—1957. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

I. Linseed yield
   (i) 520 lb./ac. (ii) 93.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of seed in lb./ac.
   Treatment   M₁ M₂ M₃ M₄ M₅ M₆ M₇ M₈ M₉
   Av. yield   1200 1015  44  161 1034  66  118
   S.E./mean   =  46.9 lb./ac.

II. Wheat yield
   (i) 845 lb./ac. (ii) 112.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.
   Treatment   M₁ M₂ M₃ M₄ M₅ M₆ M₇ M₈ M₉
   Av. yield   1182 868  570  814  791
   S.E./mean   = 106.1 lb./ac.

III. Gram yield
   (i) 101 lb./ac. (ii) 60.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment   M₁ M₂ M₃ M₄ M₅ M₆ M₇ M₈ M₉
   Av. yield   201 148  10 132  13
   S.E./mean   =  30.4 lb./ac.
Crop : Sesamum and Maize (Kharif).

Object: To study the effect of mixed cropping of Sesamum with Maize.

1. BASAL CONDITIONS:
   (i) and (ii) N.A.  
   (iii) 6 and 6.7.1955.  
   (iv) (a) 1 tractor ploughing, 2 discings and teaming.  
   (v) N.A.  
   (vi) Irrigated.  
   (vii) 3 hoeings, 2 weedings and 2 thinings.  
   (viii) N.A.  

2. TREATMENTS:
   6 mixture treatments: T1=Sesamum alone, T2=Maize alone, T3=Maize+Sesamum in separate rows, T4=Maize+Sesamum mixed in same row, T5=Maize+Sesamum pure in separate row at $\frac{1}{2}$ seed rate and T6=Maize+Sesamum mixed in same row at $\frac{1}{2}$ seed rate.

3. DESIGN:
   (i) R.B.D.  
   (ii) 6.  
   (iii) 6.  
   (iv) (a) N.A.  
   (v) N.A.  
   (vi) N.A.  
   (vii) Yes.

4. GENERAL:
   (i) N.A.  
   (ii) Nil.  
   (iii) Yield of Sesamum.  
   (iv) 1952—contd. (b) and (c) N.A.  
   (v) to (vii) Nil.

5. RESULTS:
   (i) 14.0 lb./ac.  
   (ii) 36.2 lb./ac.  
   (iii) Treatment differences are not significant.  
   (iv) Av. yield of sesame in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>109</td>
<td>118</td>
<td>64</td>
<td>71</td>
<td>81</td>
</tr>
</tbody>
</table>

S.E./mean = 14.8 lb./ac.

Crop : Maize and Sesamum (Kharif).  

Object: To study the effect of mixed cropping of Sesamum with Maize on their yield.

1. BASAL CONDITIONS:
   (i) and (ii) N.A.  
   (iii) 6 and 7.7.1955.  
   (iv) (a) 1 tractor ploughing, 2 discings and teaming.  
   (v) N.A.  
   (vi) Irrigated.  
   (vii) 3 hoeings, 2 weedings and 2 thinings.  
   (viii) N.A.  

2. TREATMENTS:
   Same as in exp. no. 54(48) above.

3. DESIGN:
   (i) Satisfactory.  
   (ii) Stem borer attack on maize.  
   (iii) Yield of grain.  
   (iv) 1952—contd. (b) and (c) N.A.  
   (v) to (vii) Nil.

4. GENERAL:
   (i) N.A.  
   (ii) Nil.  
   (iii) Yield of Sesamum.  
   (iv) 1952—contd. (b) and (c) N.A.  
   (v) to (vii) Nil.

5. RESULTS:
   Sesamum yield
   (i) 473 lb./ac.  
   (ii) 68.6 lb./ac.  
   (iii) Treatment differences are not significant.  
   (iv) Av. yield of sesame in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>623</td>
<td>406</td>
<td>444</td>
<td>439</td>
<td>452</td>
</tr>
</tbody>
</table>

S.E./mean = 28.0 lb./ac.

Maize yield
   (i) 474 lb./ac.  
   (ii) 121.0 lb./ac.  
   (iii) Treatment differences are not significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1029</td>
<td>336</td>
<td>374</td>
<td>352</td>
<td>280</td>
</tr>
</tbody>
</table>

S.E./mean = 49.4 lb./ac.
Crop: Sesame and Maize.

Object: To study the effect of mixed cropping of Sesame with Maize on their yield.

1. BASEL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Clay loam. (b) N.A. (iii) 14.7.1956. (iv) (a) Tractor ploughing, grubbing and discing. (c) Line sowing. (d) and (e) N.A. (v) N.I. (vi) Sesame N.P. 7 (medium) and Maize yellow No. 2 (medium). (vii) Unirrigated. (viii) Weeding and hoeing.
   (a) 16.10.1956. (b) 15.10.1956.

2. TREATMENTS:
   Same as in expt. no. 54(48) on page 487.

3. DESIGN:
   (i) R.B.D. (ii) 3. (b) N.A. (iii) 6. (iv) (a) 35'x24'. (b) 33'x22'. (v) 1'x1'. (vi) N.A.

4. GENERAL:
   (i) Completely lodged. (ii) Sesame attacked by stem rot. (iii) Growth and grain yield. (iv) (a) 1952—contd. (b) No. (c) N.A. (v) and (vi) Nil. (vii) Sesame crop failed.

5. RESULTS:
   (i) 101 lb./ac. (ii) 141.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of maize grain in lb./ac.

   Treatment | T_1  | T_2  | T_3  | T_4  | T_5  | T_6  | T_7  | T_8  |
   Av. yield  | 1424 | 790  | 889  | 922  | 1029 |
   S.E./mean  | 57.6 lb./ac.

Crop: Sugarcane.

Object: To study comparative effect of rotations on growth and yield of Sugarcane.

1. BASEL CONDITIONS:
   (i) and (ii) N.A. (iii) Middle of February, 1958. (iv) (a) 5 ploughings and 2 beamings. (b) Sowing in lines. (c) 50 mds./ac. (d) and (e) N.A. (v) 10 tons/ac. of F.Y.M. and 80 lbs. ac. of N as A/S. (vi) N.A. (vii) Irrigated. (viii) 2 weedings and 2 hoeings. (ix) N.A. (x) March—April 1959.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) 3. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 62'x42'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of sugarcane. (iv) (a) 1951—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 19.68 tons/ac. (ii) 3.67 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of sugarcane in tons/ac.

   Treatment | T_1  | T_2  | T_3  | T_4  | T_5  |
   Av. yield  | 19.52 | 20.75 | 18.77 |
   S.E./mean  | 1.83 tons/ac.
Crop :- Wheat and Bajra.
Type :- 'R'.

Object :- To study the effect of organic and inorganic manures on the yield of crops under different rotations.

1. BASAL CONDITIONS:
   (i) (a) As per treatments. (b) and (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) Wheat on 8.11.1956 and Bajra, 5 and 26.7.1956. (iv) (a) to (e) N.A. (v) Nil. (vi) Wheat N.P.—718 (medium) and bajra local. (vii) Irrigated. (viii) 1 weeding. (ix) 5.59'. (x) 2.11.1956 and 22 to 26.4.1957.

2. TREATMENTS:
   Main-plot treatments:
   3 rotations: R1—Bajra—Wheat, R2—Fallow—Wheat and R3—Bajra—Fallow.

   Sub-plot treatments:
   5 levels of F.Y.M.: F0 = 0, F1 = 2.5, F2 = 5, F3 = 10 and F4 = 20 tons/ac.

   Sub-sub-plot treatments:
   3 levels of N: N0 = 0, N1 = 20 and N2 = 40 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) 3 main-plots/replication, 5 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) 58' X 12.5. (b) 55' X 9.5' for wheat; 56' X 10' for bajra. (v) One row around. (vi) Yes.

4. GENERAL:
   (i) Wheat crop lodged due to hail storm on 13.3.1957. (ii) Attack of yellow rust on wheat. (iii) Growth observations and grain yield. (iv) to (vi) N.A. (vii) Tables of means N.A.

5. RESULTS:

   Wheat
   (i) 1053 lb./ac. (ii) (a) 193.4 lb./ac. (b) 258.2 lb./ac. (c) 114.4 lb./ac. (iii) Main effect of N is highly significant and main effect of F is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R1</th>
<th>R2</th>
<th>F0</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>971</td>
<td>1135</td>
<td>502</td>
<td>864</td>
<td>1127</td>
<td>1284</td>
<td>1399</td>
<td>765</td>
<td>1061</td>
<td>1333</td>
</tr>
</tbody>
</table>

   S.E. of difference of two
   1. R marginal means
   2. F marginal means
   3. N marginal means

   Bajra
   (i) 462 lb./ac. (ii) (a) 13.16 lb./ac. (b) 362.0 lb./ac. (c) 125.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R1</th>
<th>R2</th>
<th>F0</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>N0</th>
<th>N1</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>473</td>
<td>471</td>
<td>399</td>
<td>448</td>
<td>489</td>
<td>452</td>
<td>524</td>
<td>417</td>
<td>449</td>
<td>521</td>
</tr>
</tbody>
</table>

   S.E. of difference of two
   1. R marginal means
   2. F marginal means
   3. N marginal means

   Crop :- Wheat and Bajra (Kharif).
   Type :- 'R'.

Object :- To study the effect of barley rotations in relation to manures and fertilizers.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) to (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
Crop: Maize, Guar and Cowpea (Kharif).
Ref: I.A.R.I. 54(49).
Type: ‘R’.

Object: To study the effect of manuring on different crop rotations.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) N.A. (iii) 1 and 2.7.1954. (iv) (a) 3 ploughings with victory plough and 3 ploughings with desi plough. (b) Sowing in lines. (c) to (e) N.A. (vi) Nil. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) Maize: 6.10.1954. Cowpea: 18.11.1954 and 25.11.1954.

2. TREATMENTS:
   8 rotations: R1=Maize-Fallow, R2=Fallow-Wheat, R3=Fallow-Wheat (manured with 10 tons/ac. of F.Y.M.)—Wheat, R4=Maize—Pass, R5=Guar—Wheat (manured with 60 lb/ac. of P₂O₅), R6=Cowpea—Wheat and R7=Maize+G.M. crop in alternate rows manured with 60 lb/ac. of P₂O₅—Wheat.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 0. (iv) (a) 33’x31’. (b) 31’x29’. (v) 1’x1’. (vi) Yes.

4. GENERAL:
   (i) Normal (ii) Nil (iii) Yield of grain (iv) (a) 1950—contd (mxd. ind. in kharif 1954). (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 155 lb/ac. (ii) (a) 19.4 lb/ac. (b) 25.7 lb/ac. (iii) None of the effects is significant. (iv) Av. yield of bajra grain in lb/ac.
Crop: Maize, Guar, Cowpea (Kharif),

Object:—To study the effect of manuring on different crop rotations.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 20.6.1955. (iv) (a) 2 ploughings. (b) Sowing in lines. (c) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Weeding twice and one thinning. (ix) N.A. (x) Burying of guar on 20.8.1955, 2 pickings of cowpea and maize from 20 to 30.9.1955.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(49) on page 490.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of fodder and grain. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) There were heavy rains in the end of September and early October which affected the yield of maize adversely. (vii) Nil.

5. RESULTS:
   (i) 576 lb./ac. (ii) 148.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of maize grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R1</th>
<th>R4</th>
<th>R5</th>
<th>R8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>525</td>
<td>695</td>
<td>606</td>
<td>476</td>
</tr>
</tbody>
</table>

S.E./mean = 60.8 lb./ac.

Crop: As per rotation (Kharif).

Object:—To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) Cotton on 20.4.1954. (iv) (a) 1 ploughing with victory plough and 1 with desi plough. (b) Sowing in lines. (c) to (e) N.A. (v) F.Y.M. at 1400 lbs./plot to cotton and 700 lbs./plot to maize and cowpea. 1.5 mds./plot of Super to guar and 1.5 mds./plot of A/S to maize. (vi) N.A. (vii) Irrigated. (viii) 2 weedicings and 2 hoeings to cotton. 1 hoeing to maize and cowpea and 2 weedicings to maize. (ix) N.A. (x) Cotton from 26.9.1954 to 24.10.1954, guar on 23 and 24.8.1954 and maize on 10.10.1954.

2. TREATMENTS:
   10 rotations with all their phases

<table>
<thead>
<tr>
<th>1st year</th>
<th>2nd year</th>
<th>3rd year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kh.</td>
<td>Rh.</td>
<td>Kh.</td>
</tr>
<tr>
<td>Maize</td>
<td>Wheat</td>
<td>Fallow</td>
</tr>
<tr>
<td>Cowpea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Sannhemp</td>
<td>Potato</td>
</tr>
<tr>
<td>C</td>
<td>Cotton</td>
<td>Berseem</td>
</tr>
<tr>
<td>D</td>
<td>Maize</td>
<td>Wheat</td>
</tr>
<tr>
<td>Cowpea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Maize</td>
<td>Potato</td>
</tr>
</tbody>
</table>
F: Sannhemp  Wheat  Maize  Peas  —  —
G:  Fallow  Wheat  Fallow  Peas  Cotton  Fallow
H:  Fallow  Wheat  Cotton  Fallow  —  —
I:  Maize+  Wheat  Cotton  Fallow  Peas  Maize  Berseem
J:  Cowpea  Sannhemp  Wheat  Fallow  Potato  —

3. DESIGN:
(i) R.B.D.  (ii) (a) 24,  (b) N.A.  (iii) 4.  (iv) (a) 62' x 42',  (b) 61' x 41',  (v) 0.5' x 0.5'.  (vi) Yes.

4. GENERAL:
(i) and (ii) N.A.  (iii) Yield of grain and fodder.  (iv) (a) 1951 - contd.  (b) Yes.  (c) N.A.  (e) to
(vii) Nil.

5. RESULTS:

I Sugarcane yield
(i) 29.49 tons/ac.
(ii) 5.68 tons/ac.
(iii) Treatment differences are not significant.  (iv) Av. yield of sugarcane
in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>E_3</th>
<th>H_3</th>
<th>J_3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>27.39</td>
<td>30.74</td>
<td>30.34</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>2.64 tons/ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II Cotton yield
(i) 1090 lb./ac.
(ii) 172.4 lb./ac.
(iii) Treatment differences are not significant.  (iv) Av. yield of kapas
in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C_1</th>
<th>D_1</th>
<th>G_1</th>
<th>H_1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1171</td>
<td>1167</td>
<td>1110</td>
<td>914</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>86.2 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

III Maize yield
(i) 1474 lb./ac.
(ii) 219.6 lb./ac.
(iii) Treatment differences are not significant.  (iv) Av. yield of grain
in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>B_1</th>
<th>E_1</th>
<th>F_1</th>
<th>I_1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1428</td>
<td>1628</td>
<td>1497</td>
<td>1402</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>109.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV Maize + Cowpea + Sannhemp yield
(i) 9.58 tons/ac.
(ii) 1.12 tons/ac.
(iii) Treatment differences are not significant.  (iv) Av. yield of fodder
in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A_1</th>
<th>B_1</th>
<th>D_1</th>
<th>F_1</th>
<th>I_1</th>
<th>J_1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>11.73</td>
<td>6.71</td>
<td>13.90</td>
<td>6.28</td>
<td>12.27</td>
<td>6.38</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.56 tons/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- As per rotation (Rabi).
Object :- To find out a suitable rotation for Delhi tract.

Ref :- I.A.R.I. 54(5).  Type :- 'R'.

1. BASAL CONDITIONS:
(i) (a) to (c) As per treatments  (ii) (a) and (b) N.A.  (iii) Wheat on 29, 30.10.1954, Potato on 15 to
18.10.1954, Peas on 23, 0.11.1954 and Berseem on 18 and 24.10.1954.  (iv) (a) 2 ploughings.  (b) Line sowing.
(c) to (e) N.A.  (v) A/S at 200 lb. to wheat, F.Y.M. at 10 tons/ac. to potato, Ammo. Phos. at 120 lb. to
Peas and Berseem.  (vi) N.A.  (vii) Irrigated.  (viii) Wheat weeding 4 times, Potato earthing twice, Peas
hoeing once weeding once and Berseem weeding once. (ix) N.A.  (x) Wheat on 2.4.1955, Potato on 3.3.1955
2. TREATMENTS to 4. GENERAL:

Same as in expt. no. 54(50) on page 491.

5. RESULTS:

I Wheat yield

(i) 2307 lb./ac. (ii) 294.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment
A1
A2
C1
D1
F1
G1
H1
I1
J1
Av. yield
2120
2068
2713
2247
2125
2499
2225
2412
2351
S.E./mean = 147.0 lb./ac.

II Pea yield

(i) 1911 lb./ac. (ii) 225.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pea in lb./ac.

Treatment
B1
F3
G3
I3
Av. yield
1911
1998
1828
1868
S.E./mean = 142.7 lb./ac.

III Potato yield

(i) 9.32 tons/ac. (ii) 1.24 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of tuber in tons/ac.

Treatment
B1
E1
J3
Av. yield
8.45
9.59
9.91
S.E./mean = 0.62 tons/ac.

IV Berseem yield

(i) 29.86 tons/ac. (ii) 2.40 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

Treatment
C1
D2
I3
Av. yield
26.92
32.35
30.70
S.E./mean = 1.20 tons/ac.

Crop:—As per rotations (Kharif).


Ref:—I.A.R.I. 55(39).

Type:—‘R’.

Object:—To find out the best rotation for Delhi ‘Tract’.

1. BASAL CONDITIONS:

(i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) Cotton on 21 to 24.4.1955, Maize and cowpea on 20 and 27.5.1955, Guar on 23.6.1955, Maize and Sugarcane—N.A. (iv) (a) 5 ploughings for cotton 3 for maize and cowpea, 2 for G.M., 5 for maize and 4 for sugarcane. (b) Line sowing. (c) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 2 weedicings and 1 hoeing for cotton, 1 hoeing for maize and cowpea, 4 weedicings and 2 thinningings for maize and 3 hoeings and 1 earthing for sugarcane. (ix) N.A. (x) Cottton on 12.9.1955 to 6.11.1955, Maize and cowpea on 9.8.1955 to 12.8.1955, Guar on 19.8.1955, Maize on 10.1.1956 to 23.1.1956 and Sugarcane N.A.

2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 54(50) on page 491.

4. GENERAL:

(i) N.A. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1951—constd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) There were heavy rains in the end of September and early October. This affected adversely maize and cotton. (vii) Effective number of replications for sugarcane is 3.
5. RESULTS:

I Sugarcane yield

(i) 36.84 tons/ac. (ii) 0.70 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Eₗ</th>
<th>H₄</th>
<th>J₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>38.57</td>
<td>37.85</td>
<td>34.10</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.40 tons/ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II Cotton yield

(i) 1152 lb./ac. (ii) 197.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₁</th>
<th>D₂</th>
<th>G₂</th>
<th>H₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1145</td>
<td>1075</td>
<td>1089</td>
<td>1298</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>98.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

III Maize + Cowpea yield

(i) 14.50 tons/ac. (ii) 2.33 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A₁</th>
<th>D₁</th>
<th>J₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>14.41</td>
<td>16.54</td>
<td>13.74</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.16 tons/ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV Maize yield

(i) 1204 lb./ac. (ii) 311.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>E₂</th>
<th>F₁</th>
<th>F₄</th>
<th>J₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1193</td>
<td>1363</td>
<td>1237</td>
<td>1023</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>155.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- As per rotation (Rabi).


Ref :- I.A.R.I. 55(40).

Type :- 'R'.

Object :- To find out the best rotation for Delhi tract.

1. BASAL CONDITIONS:

(i) (a) to (c) As per rotation. (ii) and (iii) N.A. (iv) 4 ploughings and 1 block dressing for wheat and potato, 3 ploughings for pea and 1 for berseem. (b) Berseem by broadcast and others behind the plough. (c) Wheat—N.A., potato at 60 tubers/lin, pea at 3 lb./plot and berseem at 2 lb./plot. (d) and (e) N.A. (v) N.A. (vi) Wheat—N.P. 775, potato—D.R.R., peas—N.P. 29, and berseem—N.A. (vii) Irrigated. (viii) 1 weeding for wheat, 2 weedings and 1 earthing for potatoes, 2 weedings and 1 hoeing with Sharma hoe for pea. (ix) N.A. (x) 11 to 13.4.1956 for wheat, 15 to 21.3.1956 for potato, 21 and 23.3.1956 for peas and 6 cuttings for berseem.

2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 54(50) on page 491.

4. GENERAL:

(i) and (ii) N.A. (iii) Yiel:- of grain, fodder and tuber. (iv) (a) 1955—c稗id. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Crop was adversely affected by frost and cold wave.

5. RESULTS:

1 Wheat yield

(i) 1872 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb./ac.
Crop :- As per rotations (Kharif) and (Rabi).


Object :- To find out the best rotation for Delhi tract.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) Sandy loam to loam. (b) N.A. (iii) Wheat from end of Oct. to early Nov., cotton in the end of April, sugarcane from end of June to early July, potato in the end of March, maize in the middle of March.
   (iv) (a) 1 victory ploughing and 5 deep ploughings before sowing of each crop. (b) to (e) N.A. (v) Nil. (vi) Wheat—N.P. 175, Cotton—216F, Sugarcane—C. 312, Potato—D.R.R., Maize—Pusa yellow no. 2 and Pea—N.P. 29. (vii) N.A. (viii) 16.66" in kharif and 5.59" in rabi. (ix) Irrigated.

2. TREATMENTS:
   Same as in expl. no. 54(50) on page 491.

3. DESIGN:
   (i) R.B.D. (ii) 24 (b) N.A. (iii) 4. (iv) (a) and (b) 62' x 42'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. Lodging in wheat occurred in March. (ii) D.D.T. was sprayed in cotton against jassids. (iii) Yield of different crops were recorded separately for each plot. (iv) (a) 1951—contd. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

   1. Maize+Cowpea yield
      (i) 11.81 tons/ac. (ii) 1.06 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A₁</th>
<th>A₂</th>
<th>C₁</th>
<th>D₁</th>
<th>F₁</th>
<th>G₁</th>
<th>H₁</th>
<th>I₁</th>
<th>I₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1572</td>
<td>1893</td>
<td>1975</td>
<td>1950</td>
<td>1818</td>
<td>1925</td>
<td>2057</td>
<td>1703</td>
<td>1958</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

II Pea yield
(i) 1866 lb./ac. (ii) 463.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pea in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>B₁</th>
<th>F₁</th>
<th>G₁</th>
<th>I₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1843</td>
<td>1629</td>
<td>1884</td>
<td>2106</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>231.8 lb./ac.</td>
<td>231.8 lb./ac.</td>
<td>231.8 lb./ac.</td>
<td>231.8 lb./ac.</td>
</tr>
</tbody>
</table>

III Potato yield
(i) 5.60 tons/ac. (ii) 0.58 tons/ac. (iii) Treatment differences are significant. (iv) Av. yield of tube in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>B₁</th>
<th>E₁</th>
<th>I₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>4.92</td>
<td>5.65</td>
<td>6.22</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.29 tons/ac.</td>
<td>0.29 tons/ac.</td>
<td>0.29 tons/ac.</td>
</tr>
</tbody>
</table>

IV Benseem yield
(i) 34.65 tons/ac. (ii) 2.80 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₁</th>
<th>D₁</th>
<th>I₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>32.37</td>
<td>32.81</td>
<td>28.77</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.40 tons/ac.</td>
<td>1.40 tons/ac.</td>
<td>1.40 tons/ac.</td>
</tr>
</tbody>
</table>

Ref :- I.A.R.I. 56(56). Type :- 'R'.
II Maize yield

(i) 584 lb./ac.  (ii) 327.8 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A₁</th>
<th>D₁</th>
<th>I₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>9.95</td>
<td>12.78</td>
<td>12.70</td>
</tr>
</tbody>
</table>

S.E./mean = 0.53 tons/ac.

III Cotton yield

(i) 1303 lb./ac.  (ii) 261.2 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₁</th>
<th>D₂</th>
<th>G₃</th>
<th>H₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1201</td>
<td>1338</td>
<td>1429</td>
<td>1245</td>
</tr>
</tbody>
</table>

S.E./mean = 130.6 lb./ac.

IV Sugarcane yield

(i) 26.40 tons/ac.  (ii) 2.24 tons/ac.  (iii) Treatment differences are significant.  (iv) Av. yield of sugarcane in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F₂</th>
<th>H₉</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>24.66</td>
<td>24.47</td>
</tr>
</tbody>
</table>

S.E./mean = 1.12 tons/ac.

V Wheat yield

(i) 1765 lb./ac.  (ii) 225.8 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A₁</th>
<th>A₂</th>
<th>C₄</th>
<th>D₁</th>
<th>F₁</th>
<th>G₁</th>
<th>H₁</th>
<th>J₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1301</td>
<td>1184</td>
<td>1656</td>
<td>1949</td>
<td>1706</td>
<td>1794</td>
<td>1855</td>
<td>1664</td>
</tr>
</tbody>
</table>

S.E./mean = 112.9 lb./ac.

VI Potato yield

(i) 11.00 tons/ac.  (ii) 0.88 tons/ac.  (iii) Treatment differences are significant.  (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>B₂</th>
<th>E₁</th>
<th>J₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>9.03</td>
<td>11.72</td>
<td>12.24</td>
</tr>
</tbody>
</table>

S.E./mean = 0.44 tons/ac.

VII Pea yield

(i) 1835 lb./ac.  (ii) 146.6 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of pea in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>B₂</th>
<th>F₁</th>
<th>G₄</th>
<th>I₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1811</td>
<td>1838</td>
<td>1895</td>
<td>1794</td>
</tr>
</tbody>
</table>

S.E./mean = 73.3 lb./ac.

VIII Berseem yield

(i) 28.01 tons/ac.  (ii) 2.72 tons/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₁</th>
<th>D₂</th>
<th>I₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>22.65</td>
<td>25.09</td>
<td>21.75</td>
</tr>
</tbody>
</table>

S.E./mean = 1.36 tons/ac.
<table>
<thead>
<tr>
<th>Object:</th>
<th>To find out the best suitable rotation for Delhi tract.</th>
</tr>
</thead>
</table>

### 1. BASAL CONDITIONS:

(i) (a) to (c) As per treatments.  
(ii) (a) and (b) N.A.  
(iii) Sugarcane on 8.3.1957 and 29.3.1957.  
Cotton on 25.4.1957 and 9.5.1957.  
Maize on 27 and 28.6.1957.  
Maize + Cowpea on 3.6.1957 and  
Guar on 15.7.1957.  
(iv) (a) 6 ploughings to sugarcane, 3 to cotton, 5 to maize, 2 to maize+cowpea and 1 to guar.  
(b) to (e) N.A.  
(v) N.A., Maize yellow—2, Cotton 216—F and Sugarcane CO—312.  
(vi) Irrigated.  
(vii) 1 weeding and 1 earthing.  
(viii) N.A.  
(ix) N.A.  
Cotton on 25, 26.9.1957 and  

### 2. TREATMENTS:

Same as in expt. no. 54(50) on page 491.

### 3. DESIGN:

(i) R.B.D.  
(ii) (a) 10.  
(iii) 4.  
(iv) (a) and (b) 62' x 42'.  
(v) Nil.  
(vi) Yes.

### 4. GENERAL:

(i) N.A.  
(ii) Nil.  
(iii) Grain, fodder, kapas and sugarcane yield.  
(iv) (a) 1951—contd.  
(b) Yes.  
(c) N.A.  
(v) to (vii) Nil.

### 5. RESULTS:

#### I Maize yield

(i) 996 tons/ac.  
(ii) 217.2 tons/ac.  
(iii) Treatment differences are highly significant.  
(iv) Av. yield of grain in lb./ac.  
<table>
<thead>
<tr>
<th>Treatment</th>
<th>B_3</th>
<th>E_1</th>
<th>F_4</th>
<th>I_3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1335</td>
<td>1159</td>
<td>706</td>
<td>783</td>
</tr>
</tbody>
</table>
| S.E./mean  | 108.6 lb./ac.

#### II Cotton yield

(i) 1049 lb./ac.  
(ii) 121.8 lb./ac.  
(iii) Treatment differences are not significant.  
(iv) Av. yield of kapas in lb./ac.  
<table>
<thead>
<tr>
<th>Treatment</th>
<th>C_6</th>
<th>D_8</th>
<th>G_2</th>
<th>H_8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>975</td>
<td>1031</td>
<td>1155</td>
<td>1035</td>
</tr>
</tbody>
</table>
| S.E./mean  | 60.9 lb./ac.

#### III Maize+Cowpea yield

(i) 9.45 tons/ac.  
(ii) 1.02 tons/ac.  
(iii) Treatment differences are not significant.  
(iv) Av. yield of fodder in tons/ac.  
<table>
<thead>
<tr>
<th>Treatment</th>
<th>A_4</th>
<th>D_4</th>
<th>I_4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>9.28</td>
<td>9.57</td>
<td>10.49</td>
</tr>
</tbody>
</table>
| S.E./mean  | 0.51 tons/ac.

#### IV Sugarcane yield

(i) 29.69 tons/ac.  
(ii) 4.02 tons/ac.  
(iii) Treatment differences are not significant.  
(iv) Av. yield of sugarcane in tons/ac.  
<table>
<thead>
<tr>
<th>Treatment</th>
<th>E_4</th>
<th>H_4</th>
<th>J_4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>27.46</td>
<td>27.91</td>
<td>33.70</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>2.01 tons/ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: As per rotation (Rabi).


Object: To find out the best suitable rotation for Delhi tract.

Ref: I.A.R.I. 57(62).

Type: 'R'.

1. BASAL CONDITIONS:

2. TREATMENTS:
   Same as in exp. no. 54(50) on page 491.

3. DESIGN:
   (i) R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) and (b) 6' x 14'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain, fodder and tuber yield. (iv) (a) 1951—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   I Potato yield
   (i) 5.72 tons/ac. (ii) 0.52 tons/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of tuber in tons/ac.
   Treatment
   B   F   J
   Av. yield 4.74 6.84 5.59
   S.E./mean = 0.26 tons/ac.

   II Pea yield
   (i) 1637 lb./ac. (ii) 276.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pea in lb./ac.
   Treatment
   B   F   G   I
   Av. yield 1810 1461 1572 1623
   S.E./mean = 138.2 lb./ac.

   III Berseem yield
   (i) 18.05 tons/ac. (ii) 3.38 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of berseem in tons/ac.
   Treatment
   C   D   I
   Av. yield 16.40 15.48 22.29
   S.E./mean = 1.69 tons/ac.

   IV Wheat yield
   (i) 2104 lb./ac. (ii) 294.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.
   Treatment
   A   B   C   D   F   G   H   I   J
   Av. yield 1448 2366 2380 2119 2213 2469 2448 2041
   S.E./mean = 147.3 lb./ac.

Crop: As per rotation (Kharif).


Object: To find out a suitable rotation for Delhi tract.

Ref: I.A.R.I. 58(58).

Type: 'R'.


1. **BASAL CONDITIONS**:
   (i) (a) to (c) As per treatments.  (ii) to (x) N.A.

2. **TREATMENTS**:
   Same as in expt. no. 54(50) on page 491.

3. **DESIGN**:
   (i) R.B.D.  (ii) (a) 24.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 62′×42′.  (v) Nil.  (vi) Yes.

4. **GENERAL**:
   (i) and (ii) N.A.  (iii) Grain, fodder, kapas and sugarcane yield.  (iv) (a) 1951—contd.  (b) Yes.  (c) Nil.  (v) and (vi) Nil.  (vii) Yield of sugarcane: N.A.

5. **RESULTS**:

   **Maize yield**
   (i) 412 lb./ac.  (ii) 314 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>B₂</th>
<th>E₁</th>
<th>F₁</th>
<th>I₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>457</td>
<td>454</td>
<td>362</td>
<td>374</td>
</tr>
</tbody>
</table>
   | S.E./mean | 16.7 lb./ac.

   **Cotton yield**
   (i) 591 lb./ac.  (ii) 548 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₁</th>
<th>D₂</th>
<th>G₁</th>
<th>H₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>547</td>
<td>609</td>
<td>658</td>
<td>560</td>
</tr>
</tbody>
</table>
   | S.E./mean | 27.4 lb./ac.

   **Maize+cowpea yield**
   (i) 8.62 tons/ac.  (ii) 1.64 tons/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of fodder in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A₂</th>
<th>D₃</th>
<th>I₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>7.70</td>
<td>9.37</td>
<td>8.78</td>
</tr>
</tbody>
</table>
   | S.E./mean | 0.82 tons/ac.

---

**Crop :- As per rotation (Rabi).**  
**Ref :- I.A.R.I. 58(59).**  
**Site :- Indian Agri. Res. Instt., New Delhi.**  
**Type :- 'R'.**  

Object — To find out a suitable rotation for Delhi tract.

1. **BASAL CONDITIONS**:
   (i) (a) to (c) As per treatments.  (ii) to (x) N.A.

2. **TREATMENTS**:
   Same as in expt. no. 54(50) on page 491.

3. **DESIGN**:
   (i) R.B.D.  (ii) (a) 24.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 62′×42′.  (v) Nil.  (vi) Yes.

4. **GENERAL**:
   (i) and (ii) N.A.  (iii) Grain, tuber and fodder yield.  (iv) (a) 1951—contd.  (b) Yes.  (c) Nil.  (v) and (vi) Nil.  (vii) Yield of wheat: N.A.

5. **RESULTS**:

   **Pea yield**
   (i) 1592 lb./ac.  (ii) 106.8 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of pea in lb./ac.
Treatnent  | B | F | G | I
---|---|---|---|---
Av. yield  | 1657 | 1657 | 1580 | 1514
S.E./mean = 53.4 lb/ac.

II Potato yield
(i) 4.48 tons/ac.  
(ii) 0.48 tons/ac.  
(iii) Treatment differences are significant.  
(iv) Av. yield of potato in tons/ac.

Treatment  | B | F | I
---|---|---|---
Av. yield  | 3.28 | 5.08 | 5.09
S.E./mean = 0.24 ton/ac.

III Berseem yield
(i) 17.93 tons/ac.  
(ii) 1.28 tons/ac.  
(iii) Treatment differences are not significant.  
(iv) Av. yield of fodder in tons/ac.

Treatment  | C | D | I
---|---|---|---
Av. yield  | 17.29 | 16.96 | 19.54
S.E./mean = 0.64 tons/ac.

**Crop : Cotton (Kharif).**

**Site :** Indian Agri. Res. Instt., New Delhi.

**Ref :** I.A.R.I. 59(60).

**Type :** ‘B’.

**Object :** To study the relationship between cropping pattern and irrigation intensity.

1. **BASAL CONDITIONS**:
   
   (i) As per treatments. (iii) N.A.  (iii) 6 and 7.5.1958.  
   (iv) (a) 1 dest ploughing, 1 tripal after spreading F.Y.M., 1 dest and 2 tripal ploughings after soaking irrigation.  
   (b) and (c) N.A.  (d) 30° between rows.  
   (vii) As per treatments.  
   (viii) 2 hoeings, 2 weedicings and 1 thinning.  
   (ix) 22.9.  

2. **TREATMENTS**:

**Main-plot treatments**:

All phases of the following rotations

<table>
<thead>
<tr>
<th>1st year</th>
<th>2nd year</th>
<th>3rd year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kharif</td>
<td>Rab</td>
<td>Kharif</td>
</tr>
<tr>
<td>A</td>
<td>Cotton</td>
<td>Fallow</td>
</tr>
<tr>
<td>B</td>
<td>Cotton</td>
<td>Berseem</td>
</tr>
<tr>
<td>C</td>
<td>Cotton</td>
<td>Berseem</td>
</tr>
<tr>
<td>D</td>
<td>Cotton</td>
<td>Berseem</td>
</tr>
<tr>
<td>E</td>
<td>Maize</td>
<td>Fallow</td>
</tr>
<tr>
<td>F</td>
<td>Maize</td>
<td>Berseem</td>
</tr>
<tr>
<td>G</td>
<td>Maize</td>
<td>Berseem</td>
</tr>
<tr>
<td>H</td>
<td>Maize</td>
<td>Berseem</td>
</tr>
<tr>
<td>J</td>
<td>Maize</td>
<td>Fallow</td>
</tr>
<tr>
<td>K</td>
<td>Maize</td>
<td>Fallow</td>
</tr>
<tr>
<td>L</td>
<td>Maize</td>
<td>Fallow</td>
</tr>
<tr>
<td>M</td>
<td>Maize</td>
<td>Berseem</td>
</tr>
</tbody>
</table>

**Sub-plot treatments**:

3 levels of irrigation : 1 = 30.5" at 21" per irrigation, 2 = 31.5" at 3" per irrigation and 3 = 32.5" at 3" per irrigation.

The above levels include a basal pre-sowing irrigation also.
3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 38' x 16'. (b) 33' x 12.5'. (v) 2.5' x 1.75'. (vi) Yes.

4. GENERAL:
(i) Due to more rains there was more vegetative growth and consequently low yield of cotton. (ii) Nil. (iii) Yield of seed. (iv) (a) 1955—N.A. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 808 lb./ac. (ii) (a) 273.0 lb./ac. (b) 81.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>A1</th>
<th>B1</th>
<th>C1</th>
<th>D1</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>823</td>
<td>866</td>
<td>757</td>
<td>805</td>
<td>808</td>
</tr>
<tr>
<td>I2</td>
<td>807</td>
<td>893</td>
<td>744</td>
<td>820</td>
<td>816</td>
</tr>
<tr>
<td>I3</td>
<td>879</td>
<td>835</td>
<td>648</td>
<td>840</td>
<td>800</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. Main-plot marginal means = 111.4 lb./ac.
2. I marginal means = 28.7 lb./ac.
3. I means at the same level of main-plot = 57.4 lb./ac.
4. Main-plot means at the same level of I = 120.9 lb./ac.

---

**Crop:** Sugarcane.

**Site:** Indian Agri. Res. Instt., New Delhi.

**Ref:** I.A.R.I. 58(61).

**Type:** 'R'.

Object := To study the relationship between cropping pattern and irrigation intensity.

1. BASAL CONDITIONS:
(i) As per treatments. (ii) N.A. (iii) 12, 13 15 and 17.3.1959. (iv) (a) 3 desi ploughings and 2 trip haci ploughings. (v) and (c) N.A. (vi) 3' between rows. (e) N.A. (vii) 10 tonnes of FYM + 80 lb./ac. of N as A/S+40 lb./ac. of P2O5 as Super. (viii) CO—647. (viii) Irrigated. (ix) 1 weeding, 1 earthing and tying once. (x) N.A. (x) and 11.2.1959 and 1 and 6.3.1959.

2. TREATMENTS:

**Main-plot treatments:**
Same as in exp. no. 58(69) on page 500.

**Sub-plot treatments:**
3 levels of irrigations : I1=2½" (47.5"), I2=3" (50.9") and I3=3½" (54.4") per irrigation.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 38' x 16'. (b) 33' x 9'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. DDT dusting on 9.7.1958. (iii) Yield of sugarcane. (iv) (a) 1955—contd. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 25.32 tons/ac. (ii) (a) 2.16 tons/ac. (b) 3.83 tons/ac. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in tons/ac.
Crop: Wheat (Rahi).


Object: To study the relationship between cropping pattern and irrigation intensity.

1. BASAL CONDITIONS:
   (i) As per treatments. (ii) N.A. (iii) 14, 15, 18, 19 and 20, 11, 15, 18, 19 and 20.11.1958. (iv) (a) One ploughing with victory plough one with triphali before soaking dose. One desi and 2 triphali after soaking the dose. (b) Sown by kera. (c) 35 srs./ac. (d) and (e) N.A. (v) 40 lb./ac. of N as A/S+40 lb./ac. of P₂O₅ as Super. (vi) N.P.—718. (vii) to (ix) Nil. (x) 15 to 20.4.1959.

2. TREATMENTS:
   Main-plot treatments:
   Same as in exp. no. 58(60) on page 500.
   Sub-plot treatments:
   3 levels of irrigation: I₁ = 2' at very frequent interval '15.5''', I₂ = 3' at medium interval '12.65'' and I₃ = 3' at less frequent interval '9.65''.

3. DESIGN:
   (i) Split-plot. (ii) (a) 20 main-plots/block, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 2' × 16'. (b) 3' × 12'. (v) 2' × 2'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 1972 lb./ac. (ii) (a) 259.7 lb./ac. (b) 217.5 lb./ac. (iii) Main-plot treatments are significant. 1 effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>A₁</th>
<th>A₂</th>
<th>B₁</th>
<th>B₂</th>
<th>C₁</th>
<th>C₂</th>
<th>D₁</th>
<th>D₂</th>
<th>E₁</th>
<th>E₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>I₁</td>
<td>2028</td>
<td>2093</td>
<td>1901</td>
<td>2038</td>
<td>1880</td>
<td>2018</td>
<td>1832</td>
<td>1906</td>
<td>1696</td>
</tr>
<tr>
<td>I₂</td>
<td>1769</td>
<td>1899</td>
<td>1769</td>
<td>2059</td>
<td>1707</td>
<td>2080</td>
<td>1990</td>
<td>1839</td>
<td>1788</td>
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<tr>
<td>I₃</td>
<td>1812</td>
<td>2062</td>
<td>1786</td>
<td>1887</td>
<td>1661</td>
<td>1923</td>
<td>1580</td>
<td>1478</td>
<td>1664</td>
</tr>
</tbody>
</table>

Mean: 1867 2017 1782 1958 1683 2007 1801 1741 1716 1836

<table>
<thead>
<tr>
<th>F₁</th>
<th>F₂</th>
<th>G₁</th>
<th>G₂</th>
<th>H₁</th>
<th>H₂</th>
<th>J₁</th>
<th>K₁</th>
<th>L₁</th>
<th>M₁</th>
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<tbody>
<tr>
<td>2062</td>
<td>1990</td>
<td>1994</td>
<td>2123</td>
<td>2130</td>
<td>1574</td>
<td>1702</td>
<td>2088</td>
<td>2030</td>
<td>1798</td>
</tr>
<tr>
<td>1915</td>
<td>1840</td>
<td>1839</td>
<td>1933</td>
<td>1937</td>
<td>1368</td>
<td>1700</td>
<td>1858</td>
<td>1992</td>
<td>1665</td>
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<tr>
<td>1865</td>
<td>1721</td>
<td>1473</td>
<td>1829</td>
<td>1590</td>
<td>1224</td>
<td>1772</td>
<td>1947</td>
<td>1555</td>
<td>1415</td>
</tr>
</tbody>
</table>

Mean: 1943 1831 1691

| 1947 | 1861 | 1769 | 1958 | 1689 | 1389 | 1721 | 1864 | 1859 | 1637 |

Mean: 1822
Crop: Jowar and Cowpea (Kharif).
Ref: I.A.R.I. 58(63).
Type: 'R'.

Object: To study the relationship between cropping pattern and irrigation intensity.

1. BASAL CONDITIONS:
(i) As per treatments. (ii) N.A. (iii) 18, 23 7.1958. (iv) (a) 2 ploughings by desi plough. (b) Sowing with kera. (c) N.A. (v) 40 lb./ac. of N as A/S+40 lb./ac. of P2O5 as Super. (vi) Local (Jowar) and K=499 (Cowpea). (vii) Irrigated. (viii) Nil. (ix) 20.5". (x) 10 to 12.10.1958.

2. TREATMENTS:
Main-plot treatments:
Same as in expt. no. 58 (60) on page 500.
Sub-plot treatments:
3 levels of irrigation: I0=0, I1=4" and I2=20.5" to 24.5".

3. DESIGN:
(i) Split-plot. (ii & b) N.A. (iii) 4. (iv) (a) and (b) 38'X16'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1955--contd. (b) and (c) N.A. (v) and (vii) Nil.

5. RESULTS:
(i) 9.85 tons/ac. (ii) (a) 1.66 tons/ac. (b) 0.68 tons/ac. (iii) Main-plot treatments are significant. (iv) Av. yield of green fodder in tons/ac.

<table>
<thead>
<tr>
<th>C3</th>
<th>D2</th>
<th>D3</th>
<th>G4</th>
<th>H4</th>
<th>H5</th>
<th>L3</th>
<th>M3</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>12.64</td>
<td>10.35</td>
<td>9.91</td>
<td>10.12</td>
<td>9.32</td>
<td>9.00</td>
<td>9.38</td>
<td>8.85</td>
<td>9.02</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. Main-plot marginal means = 0.68 tons/ac.
2. I marginal means = 0.37 tons/ac.
3. I means at the same level of main-plot = 0.48 tons/ac.
4. Main-plot means at the same level of sub-plot = 0.76 tons/ac.

Crop: Potato (Rabi).
Ref: I.A.R.I. 58(64).
Type: 'R'.

Object: To study the relationship between cropping pattern and irrigation intensity.

1. BASAL CONDITIONS:
(i) and (ii) N.A. (iii) 12.11.1958. (iv) (a) 2 desi ploughings and 2 tripal ploughings. (b) and (c) N.A. (d) Between rows 1'. (e) N.A. (v) 20 tons/ac. of F.Y.M.+80 lb./ac. of N as A/S+40 lb./ac. of P2O5 as Super. (vi) 80 lb./ac. of K2O as Tot. Sul. (vii) Upr-to-case. (viii) Irrigated. (ix) 2 earthings. (x) 15". (x) 10.3.1959.
2. **TREATMENTS**:
   3 levels of irrigation: $I_1 = 24''$, $I_2 = 33''$ and $I_3 = 38''$.

3. **DESIGN**:
   (i) R.B.D.  (ii) (a) and (b) N.A. (iii) 4, (iv) (a) $33'' \times 16''$, (b) $33'' \times 12''$. (v) Nil. (vi) Yes.

4. **GENERAL**:
   (i) Good. (ii) Nil. Spraying copper shell fungicide. (iii) to (vii) N.A.

5. **RESULTS**:
   (i) 8.32 tons/ac. (ii) 0.84 tons/ac. (iii) Treatment differences are not significant, (iv) Av. yield of tuber in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$I_1$</th>
<th>$I_2$</th>
<th>$I_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>8.47</td>
<td>8.19</td>
<td>8.30</td>
</tr>
</tbody>
</table>

   S.E./mean = 0.42 tons/ac.

---

**Crop:** Berseem *(Rabi)*.  
**Site:** Indian Agric. Res. Instt., New Delhi.  
**Ref:** J.A.R.I. 58(65).  
**Type:** 'R'.

Object: To study the relationship between cropping pattern and irrigation intensity.

1. **BASAL CONDITIONS**:
   (i) and (ii) N.A.  (iii) 18, 19.10.1958 for $(T_1, G_1, H_1, M_1)$ and 8, 19.11.1958 for $(B_1, C_1, D_1)$.  (iv) (a) 2 deep ploughings. (b) to (e) N.A. (v) 20 lb/ac. of N as A/S+80 lb/ac. of $P_2O_5$ as Supr. (vi) N.A. (vii) Irrigated (viii) Nil. (ix) N.A. (x) 5 cuttings from 23/24.12.1958 to 6.5.1959.

2. **TREATMENTS**:
   (i) Split-plot.  (ii) (a) and (b) N.A.  (iii) 4.  (iv) (a) $38'' \times 16''$, (b) $33'' \times 12''$.  (v) and (vi) N.A.

3. **DESIGN**:
   (i) Split-plot.  (ii) (a) and (b) N.A.  (iii) 4. (iv) (a) $38'' \times 16''$, (b) $33'' \times 12''$. (v) N.A.

4. **GENERAL**:
   (i) Good. (ii) Nil. (iii) to (vii) N.A.

5. **RESULTS**:
   (i) 26.22 tons/ac. (ii) 4.13 tons/ac. (b) 2.02 tons/ac. (iii) Main-plot treatments and effect are highly significant. (iv) Av. yield of green fodder in tons/ac.

<table>
<thead>
<tr>
<th>$B_1$</th>
<th>$C_1$</th>
<th>$D_1$</th>
<th>$F_1$</th>
<th>$G_1$</th>
<th>$H_1$</th>
<th>$M_1$</th>
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<tbody>
<tr>
<td>$I_1$</td>
<td>20.83</td>
<td>21.65</td>
<td>25.28</td>
<td>33.12</td>
<td>31.69</td>
<td>31.33</td>
<td>33.60</td>
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<tr>
<td>$I_2$</td>
<td>20.43</td>
<td>18.96</td>
<td>21.35</td>
<td>30.66</td>
<td>32.36</td>
<td>28.27</td>
<td>31.69</td>
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<tr>
<td>$I_3$</td>
<td>19.45</td>
<td>16.64</td>
<td>19.13</td>
<td>29.08</td>
<td>29.48</td>
<td>26.12</td>
<td>30.15</td>
</tr>
</tbody>
</table>

Mean = 20.24, 19.08, 21.92, 30.95, 31.18, 28.57, 31.61, 26.22

S.E. of difference of two
1. Main-plot marginal means = 1.68 tons/ac.
2. 1 marginal mean = 0.36 tons/ac.
3. 1 means at the same level of main-plot = 1.43 tons/ac.
4. Main-plot means at the same level of I = 2.05 tons/ac.
Crop : Wheat. 
Ref : I.A.R.L. 59(49). 
Type : 1'2'. 

Object : To study the relationship between cropping pattern and irrigation intensity.

1. BASAL CONDITIONS : 
(i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 29.11.1959 and 1.12.1959. (iv) 1 deep ploughing and 2 trifolds after soaking irrigation. (b) to (e) N.A. (v) 40 lb./ac. of N as NH4+20 lb./ac. of P2O5 as Super. (vi) N.P.—718. (vii) As per treatments. (viii) N.A. (ix) N.A. (x) 19 to 26.6.1960.

2. TREATMENTS : 
Main-plot treatments : Same as in exp. no. 58(60) on page 500.
Sub-plot treatments : 
3 levels of irrigation : I1=9.94" (in 3 irrigations). I2=7.94" (in 2 irrigations) and I3=5.44" (in one irrigation).

3. DESIGN : 
(i) Split-plot. (ii) (a) 20 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 38' X 16'. (b) 33'X 12'. (v) 2.5'X2'. (vi) Yes.

4. GENERAL : 
(i) Average. (ii) Nil. (iii) Yield of grain. (iv) to (vii) N.A.

5. RESULTS : 
(i) 1933 lb./ac. (ii) (a) 393.0 lb./ac. (b) 286.7 lb./ac. (iii) Main-plot treatments are highly significant. I effect is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>A1</th>
<th>A2</th>
<th>B1</th>
<th>B2</th>
<th>C1</th>
<th>C2</th>
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<td>1928</td>
<td>1534</td>
<td>2018</td>
<td>1970</td>
<td>1651</td>
<td>1989</td>
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<td>I2</td>
<td>2023</td>
<td>1813</td>
<td>1971</td>
<td>1735</td>
<td>2009</td>
<td>2320</td>
<td>2015</td>
<td>2181</td>
<td>1537</td>
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<td>I3</td>
<td>2030</td>
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<td></td>
<td>1954</td>
<td>1686</td>
<td>1970</td>
<td>1856</td>
<td>1730</td>
<td>2067</td>
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<th>H1</th>
<th>H2</th>
<th>J1</th>
<th>J2</th>
<th>K1</th>
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<td>2623</td>
<td>2239</td>
<td>1798</td>
<td>1951</td>
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</table>

S.E. of difference of two 
1. Main-plot marginal means = 160.4 lb./ac.
2. 1 marginal means = 45.3 lb./ac.
3. 1 means at the same level of main-plot = 202.8 lb./ac.
4. Main-plot means at the same level of I = 230.5 lb./ac.

Crop : Cotton. 
Ref : I.A.R.L. 59(50). 
Type : 1'2'.

Object : To study the relationship between cropping pattern and irrigation intensity.
1. BASEL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 16 to 18.5.1959. (iv) (a) 1 ploughing with desi plough and 1 tripbali after soaking irrigation. (b) to (e) N.A. (v) N.A. (vi) H-1$. (vii) As per treatments. (viii) 1 thinning and 2 hoeings. (ix) N.A. (x) 19.10.1959.

2. TREATMENTS:
   Main-plot treatments:
   Same as in exp. no. 58(60) on page 500.

   Sub-plot treatments:
   3 levels of irrigation: \(I_1=36.61\), \(I_2=32.31\) and \(I_3=25.81\).
   The above levels include soaking irrigation and rain water common to all plots.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) \(38'\times16'\). (b) \(35'\times12'\). (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Seed cotton yield. (iv) to (vii) N.A.

5. RESULTS:
   (i) 1182 lb./ac. (ii) (a) 331.0 lb./ac. (b) 311.8 lb./ac. (iii) Only I effect is highly significant. (iv) Av yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>(A_1)</th>
<th>(B_1)</th>
<th>(C_1)</th>
<th>(D_1)</th>
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<td>1338</td>
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<td>(I_2)</td>
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<td>1327</td>
<td>1125</td>
<td>1561</td>
<td>1265</td>
</tr>
<tr>
<td>(I_3)</td>
<td>1033</td>
<td>949</td>
<td>929</td>
<td>955</td>
<td>966</td>
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<tr>
<td>Mean</td>
<td>1256</td>
<td>1198</td>
<td>1000</td>
<td>1185</td>
<td>1182</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. Main-plot marginal means = 135.9 lb./ac.
2. I marginal means = 43.0 lb./ac.
3. I means at the same level of main-plot = 86.1 lb./ac.
4. Main-plot means at the same level of I = 153.1 lb./ac.

---


Object:—To study the relationship between cropping pattern and irrigation intensity.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of green fodder. (iv) to (vii) N.A.

5. RESULTS:
(i) 14.59 tons/ac. (ii) (a) 1.93 tons/ac. (b) 1.37 tons/ac. (iv) Main effects of main-plot treatments and I
are highly significant. (vi) Av. yield of green fodder in tons/ac.

<table>
<thead>
<tr>
<th>C1</th>
<th>D2</th>
<th>D3</th>
<th>G4</th>
<th>H4</th>
<th>H5</th>
<th>I5</th>
<th>M5</th>
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</thead>
<tbody>
<tr>
<td>17.60</td>
<td>16.16</td>
<td>15.08</td>
<td>14.58</td>
<td>14.94</td>
<td>12.86</td>
<td>13.84</td>
<td>13.84</td>
<td>14.86</td>
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<tr>
<td>18.02</td>
<td>17.11</td>
<td>14.39</td>
<td>15.82</td>
<td>13.76</td>
<td>13.34</td>
<td>14.62</td>
<td>13.12</td>
<td>15.02</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. Main-plot marginal means = 0.79 tons/ac.
2. I marginal means = 0.34 tons/ac.
3. I means at the same level of main-plot = 0.57 tons/ac.
4. Main-plot means at the same level of I = 1.12 tons/ac.

---

Crop: Potato. 
Type: 'R'.

Object: To study the relationship between cropping pattern and irrigation intensity.

BASAL CONDITIONS:
(i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 14 and 15.10.1959. (iv) (a) 1 ploughing with desi
lough after F.Y.M., 1 desi ploughing and 2 triphali after soaking irrigation. (b) and (c) N.A. (d) 1' between rows. (e) N.A. (f) 20 tons/ac. of F.Y.M.+80 lb./ac. K2O+80 lb./ac. of N+40 lb./ac. of P2O5.
(i) Up to date. (vii) As per treatments. (viii) 2 earthings. (ix) N.A. (x) 3.3.1960.

TREATMENTS:
Main-plot treatments:
Same as in exp. no. 58(60) on page 500.
Sub-plot treatments:
Levels of Irrigation: L1=20.6" with frequent interval, L2=18.6" with medium interval and L3=17.6" with less frequent interval.

N:
(i) D. (ii) 3. (iii) 4. (iv) (a) 38'×16'. (b) 33'×12'. (v) 2'×2'. (vi) Yes.

YAL:
(i) Nil. (ii) Yield of tubers. (iv) to (vii) N.A.

ULTS:
(i) 11.97 tons/ac. (ii) 11.11 tons/ac. (iii) Treatment differences are not significant. (iv) Av. yield of tuber
in tons/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>13.18</td>
<td>11.37</td>
<td>10.87</td>
</tr>
</tbody>
</table>

S.E./mean = 0.56 tons/ac.
Crop: Berseem (Rabi).
Type: 'R'.

Ref: I.A.R.I. 59(53).

Object: To study the relationship between cropping pattern and irrigation intensity.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 21 to 28.10.1959. (iv) (a) Desi ploughing followed by triphali. (b) to (e) N.A. (v) 20 lb/ac. of N as A/S+80 lb/ac. of P_{2}O_{5} as Super. (vi) N.A. (vii) As per treatments. (viii) Nil. (ix) N.A. (a) 24.12.1959 to 12.5.1960.

2. TREATMENTS:
   Main-plot treatments:
   Same as in expt. no. 58(60) on page 500.
   Sub-plot treatments:
   3 levels of irrigation: I_{1}=39", I_{2}=33 5" and I_{3}=30.5".

3. DESIGN:
   (i) Split-plot. (ii) 7 main-plots/blocks; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 38'X16', (b) 33'X12'. (v) 23'X2'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Green fodder yield. (iv) to (vii) N.A.

5. RESULTS:
   (i) 25.20 tons/ac. (ii) (a) 5.61 tons/ac. (b) 2.60 tons/ac. (iii) Effect alone is highly significant. (iv) Av. yield of green fodder in tons/ac.

<table>
<thead>
<tr>
<th></th>
<th>B_{1}</th>
<th>C_{1}</th>
<th>D_{1}</th>
<th>F_{1}</th>
<th>G_{1}</th>
<th>H_{1}</th>
<th>M_{1}</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>I_{1}</td>
<td>23.44</td>
<td>30.18</td>
<td>33.63</td>
<td>27.92</td>
<td>26.76</td>
<td>31.74</td>
<td>26.75</td>
<td>25.63</td>
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<tr>
<td>I_{2}</td>
<td>21.83</td>
<td>26.23</td>
<td>27.62</td>
<td>24.71</td>
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<td>26.97</td>
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<td>I_{3}</td>
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<td>22.18</td>
<td>21.92</td>
<td>24.38</td>
<td>19.60</td>
<td>22.2</td>
</tr>
</tbody>
</table>

Mean: 21.37 26.89 28.15 24.94 24.53 27.70 22.84 25.20

S.E. of difference of two
   1. Main-plot marginal means = 2.30 tons/ac.
   2. I marginal mean = 0.69 tons/ac.
   3. I means at the same level of main-plot = 1.84 tons/ac.
   4. Main-plot means at the same level of I = 2.75 tons/ac.

Crop: Maize.
Ref: I.A.R.I. 59(54).
Type: 'R'.

Object: To study the relationship between cropping pattern and irrigation intensity.

1. BASAL CONDITIONS:
   (i) (a) to (c) As per treatments. (ii) (a) and (b) N.A. (iii) 1 and 2.7.1959. (iv) (a) 1 desi ploughing and 2 triphali ploughing after soaking irrigation. (b) to (e) N.A. (v) 10 tons/ac. of FYM + 40 lb/ac. of N+20 lb/ac. of P_{2}O_{5}. (vi) Yellow no. 16. (vii) As per treatments. (viii) 2 weedings with horse hoe. (ix) N.A. (a) 28 and 29.9.1959.
2. TREATMENTS:

Main-plot treatments:

Same as in exp. no. 58(60) on page 500.

Sub-plot treatments:

3 levels of irrigation: \( I_1 = 30.00" \) with frequent interval, \( I_2 = 28.00" \) with medium interval and \( I_3 = 25.00" \) with less frequent interval.

3. DESIGN:

(i) Split-plot. (ii) (a) 8 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 38' \( \times 16' \). (b) 33' \( \times 12' \). (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of grain. (iv) to (vii) N.A.

5. RESULTS:

(i) 2120 lb./ac. (ii) (a) 428.2 lb./ac. (b) 300.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
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<th>E₁</th>
<th>F₁</th>
<th>G₁</th>
<th>H₁</th>
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Mean: 2120

S.E. of difference of two

1. Main-plot marginal means = 174.8 lb./ac.
2. I marginal means = 75.2 lb./ac.
3. I means at the same level of main-plot = 212.7 lb./ac.
4. Main-plot means at the same level of I = 246.4 lb./ac.

Crop: Maize (Kharif).


Ref: I.A.R.I. 58(66).

Type: 'R'.

Object: To study the relationship between cropping pattern and irrigation intensity.

1. BASAL CONDITIONS:

(i) As per treatments. (ii) (a) and (b) N.A. (iii) 8 and 9.7, 1958. (iv) (a) 3 ploughings and 2 rain/season. (b) to (c) N.A. (v) 5 tons/acre of F.Y.M. +40 lb./ac. of N as A/S+20 lb./ac. of P₄O₅ as Super. (vi) Yellow no. 16. (vii) Irrigated. (viii) 1 hoeing with horse hoe and 2 hand hoeings. (ix) 20.2'. (x) 6 to 9.10.1958.

2. TREATMENTS:

Main-plot treatments:

Same as in exp. no. 58(60) on page 500.

Sub-plot treatments:

3 levels of irrigation: \( I_1 = 26.7" \) at \( 2" \) per irrigation, \( I_2 = 27.2" \) at \( 3" \) per irrigation and \( I_3 = 27.7" \) at \( 3" \) per irrigation.

3. DESIGN:

(i) Split-plot. (ii) (a) 8 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 38' \( \times 16' \). (b) 33' \( \times 12' \). (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. Dusting with DDT on 25.8.1958 to check the attack of chilbanelus. (iv) (a) 1955—N.A. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

(i) 1472 lb./ac. (ii) (a) 594.6 lb./ac. (b) 221.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th></th>
<th>E₁</th>
<th>F₁</th>
<th>G₁</th>
<th>H₁</th>
<th>J₁</th>
<th>K₁</th>
<th>L₁</th>
<th>M₁</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>I₁</td>
<td>1475</td>
<td>1418</td>
<td>1684</td>
<td>1339</td>
<td>1430</td>
<td>1354</td>
<td>1621</td>
<td>1404</td>
<td>1466</td>
</tr>
<tr>
<td>I₂</td>
<td>1548</td>
<td>1430</td>
<td>1609</td>
<td>1401</td>
<td>1454</td>
<td>1165</td>
<td>1468</td>
<td>1476</td>
<td>1444</td>
</tr>
<tr>
<td>I₃</td>
<td>1480</td>
<td>1569</td>
<td>1598</td>
<td>1344</td>
<td>1456</td>
<td>1483</td>
<td>1542</td>
<td>1574</td>
<td>1506</td>
</tr>
<tr>
<td>Mean</td>
<td>1501</td>
<td>1472</td>
<td>1630</td>
<td>1361</td>
<td>1447</td>
<td>1334</td>
<td>1544</td>
<td>1485</td>
<td>1472</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. Main-plot marginal means = 124.3 lb./ac.
2. I marginal means = 55.2 lb./ac.
3. I means at the same level of main-plot = 156.3 lb./ac.
4. Main-plot means at the same level of I = 178.2 lb./ac.
Central Tobacco Research Institute
RAJAHMUNDARY
Central Tobacco Research Institute, Rajahmundry,

1. Name of the experimental station: Central Tobacco Research Institute.
2. Tehsil or Taluka: Rajahmundry.
3. District: East Godavari.
4. Address: Central Tobacco Research Institute, Rajahmundry-1, Andhra Pradesh.
6. Latitude 17° N
7. Whether research, multiplication or demonstration farm: Research.
8. Whether State, University or private managed: Indian Council of Agricultural Research.
9. Programme of research: Fundamental and applied.
11. Type of tract it represents: Black-cotton soil tract.
12. General description of the topography of the experimental area: Plain levelled land located on the banks of the river Godavari. But these lands are protected from flooding or submergence by a bund.
13. Soils:
   (a) Broad soil types:
      (i) Depth:
      (ii) Colour: Clay.
      (iii) Structure: Angular blocky
   (b) Chemical analysis:
      Depth
      Organic carbon: 0.48 0.44
      Total nitrogen: 0.035 0.029
      Available P₂O₅: 0.033 0.030
      T.S.S.: 0.063 0.057
      pH: 8.2 7.5
      Exchangeable cations (m.e. 100 gm.):
      Ca: 18.46 14.23
      Mg: 1.9 8.63
      K: 0.29 0.46
      Total: 51.74 63.14
      (Year of analysis is 1957).
(c) Mechanical analysis:

<table>
<thead>
<tr>
<th>Depth</th>
<th>0—9&quot;</th>
<th>9—18&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse sand</td>
<td>1.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Fine sand</td>
<td>17.0</td>
<td>11.4</td>
</tr>
<tr>
<td>Silt</td>
<td>22.3</td>
<td>15.1</td>
</tr>
<tr>
<td>Clay</td>
<td>36.5</td>
<td>61.8</td>
</tr>
<tr>
<td>CaCO₃</td>
<td>1.5</td>
<td>0.3</td>
</tr>
</tbody>
</table>

14. Normal average rainfall in mm.:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall</td>
<td>135</td>
<td>268</td>
<td>219</td>
<td>116</td>
<td>64</td>
<td>1</td>
<td>36</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>848</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(The period on which the figures are based is 1965—1966.)

15. Irrigation facilities available:

Yes, since 1960.

16. Whether any proper drainage system exists:

Necessary surface drainage has been provided for bailing out excess rainwater.
1. Name of the experimental station : Wrapper and Hookah Tobacco Research Station.

2. Tehsil or Taluka : Dinhata.

3. District : Cooch Behar.

4. Address : Dinhata (P.O.), Cooch Behar Distt., W.B.


6. Latitude
   26° 20' N

7. Whether Research, multiplication or demonstration farm : Research farm.

8. Whether State, University or privately managed : Indian Council of Agricultural Research.

9. Programme of research : Work on agronomical and botanical aspects of tobacco.

10. Normal cropping pattern : Tobacco in rabi followed by jute or paddy in kharif.

11. Type of tract it represents : Sub-tropical humid.

12. General description of the topography of the experimental area : Plane land with ample drainage system and farm roads and bounded by a bamboo plantation on one side and a dead river and beyond, and village roads on the other sides.

13. Soils :
   (a) Broad soil types :
   (i) Depth :
   (ii) Colour :
   (iii) Structure :
   (b) Chemical analysis :
   (c) Mechanical analysis :

14. Normal average rainfall in mm.:

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>651.2</td>
</tr>
<tr>
<td>July</td>
<td>563.6</td>
</tr>
<tr>
<td>Aug.</td>
<td>436.4</td>
</tr>
<tr>
<td>Sept.</td>
<td>310.0</td>
</tr>
<tr>
<td>Oct.</td>
<td>178.5</td>
</tr>
<tr>
<td>Nov.</td>
<td>34.7</td>
</tr>
<tr>
<td>Dec.</td>
<td>0.1</td>
</tr>
<tr>
<td>Jan.</td>
<td>34.6</td>
</tr>
<tr>
<td>Feb.</td>
<td>12.6</td>
</tr>
<tr>
<td>March</td>
<td>35.0</td>
</tr>
<tr>
<td>April</td>
<td>105.4</td>
</tr>
<tr>
<td>May</td>
<td>416.5</td>
</tr>
<tr>
<td>Total</td>
<td>226.3</td>
</tr>
</tbody>
</table>

(The period on which the figures are based is 1956--1965.)

15. Irrigation facilities available : A deep tube well; since 1961.

16. Whether any proper drainage system exists : Yes.
I. Name of the experimental station: Tobacco Research Station.

2. Tehsil or Taluka: Hunsur.

3. District: Mysore.

4. Address: Officer-in-charge, Tobacco Research Station, Hunsur (P.O.), Mysore State.

5. Year of establishment: 1957.

6. Latitude: 12° - 17° - 55°
   Longitude: 76° - 17° - 35°
   Altitude: 2,711 feet above mean sea level

7. Whether research, multiplication or demonstration farm: Research farm.

8. Whether State, University or private managed: Indian Council of Agricultural Research, New Delhi.

9. Programme of research: Programme of work include Agronomical, Botanical and Pathological research on the flue cured virginia, burley and taba tobacco.

10. Normal cropping pattern: Normally two crops in a year are cultivated under rainfed conditions. The first cropping period is from April to September and the second period is from October to January. The crops generally grown from April to September consist of ragi, til, groundnut (short duration). Flue cured virginia tobacco and jowar. The crops grown in October to January are taba tobacco, late ragi, horse gram, coriander, bengal gram and niger.

11. Type of tract it represents: It represents semi-maland tract mostly under rainfed conditions with small trees and open scrub and dense scrub in many regions. The soils are mostly light, sandy to gravelly in texture, reddish to light brown in colour and with poor fertility.

12. General description of the topography of the experimental area:
   The farm is located within the municipal limits. It is situated on the side of a hillock, sloping to the west and is benchterrace. Consequently all the main plots are length (north-south direction than broad.

   There is a small storage tank on the south side of the farm which is fed by Lakshmanathirtha river water from Acherut by channel. This tank gets dried up during the off season and hence not of much use to the farm at that period. On the slope side of the channel and to the west of the farm, paddy is cultivated during the season.

   The total area of the farm is about 36 acres, of which about 24 acres are under cultivation. The break up of the cultivable area is as follows.
Tobacco nursery about 2 acres, flue cured virginia tobacco about 10 acres, "bid" and burley tobacco about 8 acres, paddy about 4 acres. In normal years a crop of groundnut (short duration) is raised in about 8 acres early in the season under rainfed conditions in those plots where "bid" and burley tobacco will be planted as a second crop.

At present there is a well (open well) on the extreme south western corner of the farm which supplies water to laboratory and to tobacco nursery. It is hoped that a couple of open wells will be opened out in the near future when it should be possible to grow food crop (ragi) in an area of about 20 acres in the off season under irrigated conditions.

13. Soils:
   (a) Broad soil type:
       (i) Depth:
       (ii) Colour:
       (iii) Structure:
   (b) Chemical analysis:
   (c) Mechanical analysis:

14. Normal average rainfall in mm:

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80.2</td>
<td>142.4</td>
<td>69.3</td>
<td>79.6</td>
<td>127.6</td>
<td>46.6</td>
<td>21.4</td>
<td>3.3</td>
<td>3.3</td>
<td>46.6</td>
<td>74.6</td>
<td>811.9</td>
<td></td>
</tr>
</tbody>
</table>

(The period on which the figures are based is 1956—1966.)

15. Irrigation facilities available:

Irrigation facilities are not available. It is hoped to have irrigation facilities in the near future.

16. Whether any proper drainage system exists:

Ordinary surface drainage is available in all the plots. A few fields having poor sub-soil drainage were provided with artificial underground rubble drainage system during 1959-60 which are working satisfactorily so far.
1. Name of the experimental station : Tobacco Research Station.
2. Tehsil or Taluka : Pusa Block
3. District : Darbhanga
4. Address : Tobacco Research Station, Pusa P.O., District Darbhanga Bihar.
6. Latitude 25.89° N.
7. Whether research, multiplication or demonstration farm : Research farm.
8. Whether State, University or private managed : Managed by the Indian Council of Agricultural Research.
9. Programme of research : Agronomical and botanical research on cultivated varieties of \( N. \) tabacum and \( N. \) rustica species.
10. Normal cropping pattern : Maize + other or maize alone followed by tobacco.
11. Type of tract it represents : Sandy loam (calcareous).
12. General description of the topography of the experimental area : Flat and plain sloping from east to west.
13. Soils :
   (a) Broad soil types :
       Calcaceous sandy loam, alluvium.
       N.A.
       Whitsit grey.
       Single grain.
   (b) Chemical analysis :
       See appendix
   (c) Mechanical analysis :
       See appendix
14. Normal average rainfall in mm. :

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>241.3</td>
<td>203.3</td>
<td>225.7</td>
<td>214.3</td>
<td>151.4</td>
<td>24.2</td>
<td>40.2</td>
<td>2.3</td>
<td>5.1</td>
<td>13.8</td>
<td>22.5</td>
</tr>
<tr>
<td>July</td>
<td>14.1</td>
<td>27.5</td>
<td>169.8</td>
<td>234.3</td>
<td>145.4</td>
<td>18.2</td>
<td>32.0</td>
<td>4.1</td>
<td>5.4</td>
<td>11.5</td>
<td>26.0</td>
</tr>
<tr>
<td>Aug.</td>
<td>18.2</td>
<td>32.0</td>
<td>4.1</td>
<td>5.4</td>
<td>11.5</td>
<td>26.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sept.</td>
<td>5.1</td>
<td>13.8</td>
<td>22.5</td>
<td>14.1</td>
<td>27.5</td>
<td>169.8</td>
<td>234.3</td>
<td>145.4</td>
<td>18.2</td>
<td>32.0</td>
<td></td>
</tr>
</tbody>
</table>

(The period on which the figures are based is 1953-54 to 1962-63.)
15. Irrigation facilities available ; year from which the facilities were made available : Research Station is possessing one tubewell and pumpset and capacity is quite sufficient for providing irrigation facilities for an area of 30 acres since 1965.
16. Whether any proper drainage system exists : No drainage problem so far as farm is concerned.
### APPENDIX

<table>
<thead>
<tr>
<th>Depth in inches</th>
<th>Mechanical Composition Percentage of</th>
<th>Chemical Composition</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sand</td>
<td>Silts</td>
<td>Clays</td>
</tr>
<tr>
<td><strong>South Nepal Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0&quot;—18&quot;</td>
<td>29.50</td>
<td>25.25</td>
<td>7.75</td>
</tr>
<tr>
<td>18&quot;—20&quot;</td>
<td>44.90</td>
<td>16.15</td>
<td>11.45</td>
</tr>
<tr>
<td>20&quot;—22&quot;</td>
<td>47.25</td>
<td>16.25</td>
<td>6.50</td>
</tr>
<tr>
<td><strong>North Pangurbi Area</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0&quot;—17&quot;</td>
<td>30.14</td>
<td>13.50</td>
<td>10.35</td>
</tr>
<tr>
<td>17&quot;—29&quot;</td>
<td>30.46</td>
<td>25.05</td>
<td>5.35</td>
</tr>
</tbody>
</table>

Depth of Water Table: 10 ft. deep minimum and 32 ft. deep maximum.

Maximum water holding capacity: 43 to 46%.
CIGAR AND CHEROOT TOBACCO STATION, VEDASANDUR,

1. Name of the experimental station : Cigar and Cheroot Tobacco Research Station.
2. Tehsil or Taluka : Dindigul.
3. District : Madurai
4. Address : Cigar and Cheroot Tobacco Research Station, P.O. Vedasandur, Madurai District, Madras.
6. Latitude 10°32' N
   Longitude 77°37' E
   Altitude 250 feet
7. Whether research, multiplication or demonstration farm : Research farm.
8. Whether State, University or private managed : Indian Council of Agricultural Research, New Delhi.
9. Programme of research : Manorial and cultural trials on tobacco.
10. Normal cropping pattern : Tobacco during November—February every year with j epara, bajra or marua in between. Sometimes two of these, if season permits.
11. Type of tract it represents : Mixed soil of grayish coarse gravelly soils and medium red loams.
12. General description of the topography of the experimental area : The station is close to a seasonal river, the lands near the river being very much undulated and the soil being coarse gravel. The lands away from the river are red sandy and medium loams.
13. Soils :
   (a) Broad soil types :
      (i) Depth :
      (ii) Colour :
      (iii) Structure :
   (b) Chemical analysis :
      Depth pH EC TSS Available in lbs./ac. N P K
      Cigar tobacco 0—9" 8.3 Less than 0.2 168 6.0 365
      eco soil 9"—18" 8.0 " 140 8.8 270
      Chewing tobacco 0—9" 8.0 " 70 7.6 100
      eco soil 9"—18" 7.3 " 70 9.6 150
   (c) Mechanical analysis :
      N.A.
14. Normal average rainfall in mm. :
   20.3 20.6 68.0 62.7 203.0 144.9 66.2 56.5 7.7 11.9 62.1 63.3 757.2
   (The figures are based on the period 1930 to 1965.)
15. Irrigation facilities available; year from which the facilities were made available:

16. Whether any proper drainage system exists:

Yes, from wells with 30' to 40' depth. From the beginning. Fair crops can be raised at this station only with at least two irrigations per week.

The soil is highly porous. Usual drainage system for heavy and moderate rains provided with ordinary drains. Permanent drainage of the farm has not yet completed.
Crop: Tobacco.  
Ref: C.T.R.I. 54(1).

Site: Wrapper and Hookah Tobacco Res. Sta., Dinhata.  
Type: 'M'.

Object: - To study the effect of organic and inorganic manures on the yield and quality of wrapper Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Mustard. (c) Nil. (d) (a) Allurium (Doraz). (b) N.A.  (ii) 13.11.1955.  (iv) (a) 6 ploughings followed by planking and 2 cultivations followed by planking. (b) Transplanting.  (d) 20000 plants/ac.  (e) 2. (v) Nil.  (vi) Rangpur Bananas. (vii) Irrigated. (viii) Interploughing and weeding.  (ix) 0.47.  (x) 4 to 23.1.1955.

2. TREATMENTS:

Main-plot treatments:
5 manural treatments : M₀=Control (fallow plot), M₁=Diatrache sown broadcast 2 mds. of Super and ploughed in as G.M. and M₃=40 Ib./ac. of N as F.Y.M. applied by broadcast.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 levels of N as A/S : N₀=0 and N₁=50 lb./ac.
(2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=35 lb./ac.
N and P applied by broadcast at sowing.

3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/replication and 4 sub-plots/main-plot. (b) N.A.  (iv) (a) 14'x48'. 10'x44'. (v) 2'x2'. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Wide spread and severe attack of tobacco mosaic. Roguing of affected plants was done in the initial stage only. (iii) Yield of cured leaf. (iv) (a) and (b) Nil. (v) Nil. (vi) Nil. (vii) The experiment was planted rather late and possibly because of this reason the crop failed to put up normal growth.

5. RESULTS:
(i) 631 lb./ac.  (ii) 366.1 lb./ac.  (b) 134.2 lb./ac.  (iii) Main effect of P alone is significant.  (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>Mean</th>
<th>P₀</th>
<th>P₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>498</td>
<td>665</td>
<td>663</td>
<td>595</td>
<td>548</td>
<td>643</td>
</tr>
<tr>
<td>N₁</td>
<td>662</td>
<td>704</td>
<td>634</td>
<td>667</td>
<td>586</td>
<td>748</td>
</tr>
<tr>
<td>Mean</td>
<td>560</td>
<td>685</td>
<td>648</td>
<td>631</td>
<td>567</td>
<td>695</td>
</tr>
<tr>
<td>P₀</td>
<td>458</td>
<td>659</td>
<td>583</td>
<td>458</td>
<td>548</td>
<td>643</td>
</tr>
<tr>
<td>P₁</td>
<td>662</td>
<td>710</td>
<td>713</td>
<td>548</td>
<td>586</td>
<td>748</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means = 65.8 lb./ac.
2. N or P marginal means = 38.7 lb./ac.
3. N or P means at the same level of M = 67.1 lb./ac.
4. M means at the same level of N or P = 81.1 lb./ac.
S.E. of body of N x P table = 38.7 lb./ac.

Crop: Tobacco.  

Site: Wrapper and Hookah Tobacco Res. Sta., Dinhata.  
Type: 'M'.

Object: - To study the effect of various organic manures and urea on the yield and quality of Tobacco.
1. BASAL CONDITIONS
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Light silt loam. (b) N.A. (iii) 20.11.1955. Gaps filled on 20.11.1955 and 21.12.1955. (iv) (a) 4 ploughings. (b) Transplanting. (c) 10870 plants/ac. (d) 2' x 2'. (e) 1. (v) G.M. (Dhaincha) and 15 C.L.,ac. of F.Y.M. (vi) Motihari (local). (vii) Irrigated. (viii) 6 intercultures, 5 hoeings, 2 hand weeding, topping and suckering. (ix) 1.94". (x) 28.2.1956 to 14.3.1956.

2. TREATMENTS:
   4 sources of 100 lb./ac. of N : S1=Horn hoof meal, S2=Blood meal, S3=Urea and S4=F.Y.M.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 52' x 21'. (b) 48' x 20'. (v) 2' x 2'. (vi) Yes.

4. GENERAL:
   (i) Shortage of moisture during transplanting and growth periods adversely affected the stand and growth of the crop. (ii) Nil. (iii) Yield of cured leaf. (iv) (a) 1954—1958. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Unusually strong wind storms accompanied by rains during the harvesting and curing periods damaged the crop. (vii) Nil.

5. RESULTS:
   (i) 555 lb./ac. (ii) 99.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>483</td>
<td>472</td>
<td>372</td>
<td>893</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>40.7 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Tobacco.  
Ref :- C.T.R.I. 56(26).
Site :- Wrapper and Hookah Tobacco Res. Stn., Dinhata.  
Type :- 'M'.

Object :- To study the effect of various organic manures and urea on the yield and quality of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Dhaincha. for G.M. (c) Nil. (ii) (a) Light silt loam. (b) N.A. (iii) 23.11.1956. Gaps filled on 1.12.1956 and 6.12.1956. (iv) (a) 4 ploughings. (b) Transplanting. (c) 10870 plants/ac. (d) 2' x 2'. (e) 1. (v) G.M. (Dhaincha). (vi) Motihari (local). (vii) Unirrigated. (viii) 2 hand weeding, 3 intercultures, 3 hand hoeings, topping and suckering. (ix) N.A. (x) 2.2.1957 to 13.3.1957.

2. TREATMENTS:
   4 sources of 100 lb./ac. of N : S1=Horn hoof meal, S2=Blood meal, S3=Urea and S4=F.Y.M.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 40' x 16'. (b) 36' x 12'. (v) 2' x 2'. (vi) Yes.

4. GENERAL:
   (i) Good. Crop lodged. (ii) Nil. (iii) Yield of cured leaf. (iv) (a) 1954—1958. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rains during the month of January caused considerable damage to the crop by the way of causing water logged conditions. (vii) Nil.

5. RESULTS:
   (i) 809 lb./ac. (ii) 246.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S5</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>776</td>
<td>691</td>
<td>943</td>
<td>824</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>105.5 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Tobacco.  
Site: Wrapper and Hookah Tobacco Res. Stn., Dinbata.  
Type: 'M'.

Object: To study the effect of various organic manures and urea on the yield and quality of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Dhaincha for G.M. (c) 15 C.L./ac. of F.Y.M. + 100 lb./ac. of N as A/S. (ii) (a) Light silt loam. (b) N.A. (iii) N.A. (iv) (a) 4 ploughings. (b) Transplanting. (c) 10890 plants/ac. (d) 2 x 2'. (e) 1. (v) G.M. (dhaincha). (vi) Motihari (local). (vii) Irrigated. (viii) Weeding, hoeing, mummoti digging, earthing and topping. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 56(26) on page 512.

4. GENERAL:
   (i) N.A.  (ii) Heavy incidence of mosaic virus especially during post December period. (iii) Yield of cured leaf. (iv) (a) 1954—1955. (b) Yes. (c) Nil.  (v) and (b) N.A. (vi) Rainfall during the period was below normal. (vii) Nil.

5. RESULTS:
   (i) 872 lb./ac.  (ii) 155.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>862</td>
<td>906</td>
<td>860</td>
<td>858</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>63.4 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Crop: Tobacco.  
Site: Wrapper and Hookah Tobacco Res. Stn., Dinbata.  
Type: 'M'.

Object: To study the effect of various organic manures and urea on the yield and quality of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Light silt loam. (b) N.A. (iii) N.A. (iv) (a) 4 ploughings. (b) Transplanting. (c) 10,890 plants/ac. (d) 2 x 2'. (e) 1. (v) Nil. (vi) Motihari (local). (vii) Irrigated. (viii) Weeding, hoeing, mummoti digging, earthing up and topping. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 56(16) on page 512.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of cured leaf. (iv) (a) 1954—1955. (b) Yes. (c) Nil.  (v) and (b) N.A. (vi) Heavy rainfall during the harvesting period. (vii) Nil.

5. RESULTS:
   (i) 1052 lb./ac.  (ii) 277.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1728</td>
<td>1664</td>
<td>1731</td>
<td>1486</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>113.2 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Tobacco.  
Ref: C.T.R.I. 54(2).

Site: Wrapper and Hookah Tobacco Res. Sta., Dinhata.  
Type: 'M'.

Object: To study the effects of various organic manures and ash on the yield and quality of Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco. (c) Nil. (ii) (a) Alluvium (dowar). (b) N.A. (iii) 26.11.1954. (iv) (a) 6 ploughings, 2 cultivation and 8 plantings. (b) Transplanting. (c) 100/90 plants/ac. (d) 2' x 2'. (e) 1. (v) Dhalinek (G.M.). (vi) Motihari (local). (vii) Irrigated. (viii) Interplanting, weeding, topping and suckering. (ix) 0.18. (x) 15.2.1955 to 2.3.1955.

2. TREATMENTS:
4 sources of 100 lb./ac. of N: S1 = Horn and hoof meal, S2 = Blood meal, S3 = Pro and S4 = F.Y.M. N applied broadcast before planting.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 32' x 24'. (b) 48' x 30'. (v) 2' x 2'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Stray cases of hollow stem rot were observed; affected plants were up-rooted and destroyed. (iii) Yield of tobacco. (iv) (a) 1954—contd. (b) Yes. (c) No. (v) and (vi) Nil. (vii) The land was not uniform in fertility and the levels were bad. It resulted in a markedly uneven growth in the individual plots.

5. RESULTS:
(i) 636 lb./ac. (ii) 86.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>552</td>
<td>628</td>
<td>681</td>
<td>681</td>
</tr>
</tbody>
</table>

S.E./mean = 35.4 lb./ac.

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Crop: Tobacco.  
Ref: C.T.R.I. 54(3).

Site: Cigarette Tobacco Res. Sub-Sta. Farm, Guntur.  
Type: 'M'.

Object: To find out the best time of application and method of placement of fertilizers for Cigarette Tobacco.

1. BASAL CONDITIONS:
(b) (a) Groundnut—Sorghum—Fallow—Tobacco. (b) Fallow. (c) Nil. (d) (a) Black clay, (b) N.A. (ii) 8 10 1954. (iv) (a) 4 ploughings. (b) Transplanted. (c) —. (d) 33' x 33'. (e) N.A. (f) Nil. (v) Harrison special. (vii) Irrigated. (viii) 5 weeding and 2 intercultures. (x) 7.55'. (a) 8.1.1955 to 5.2.1995.

2. TREATMENTS:
All combinations of (1), (2) and (3)
1. 2 levels of N as A/S: N1 = 20 and N3 = 25 lb./ac.
2. 2 methods of applications: M1 = Broadcast and M4 = In plough furrows.
3. 3 times of application of N: T1 = 30, T2 = 20 and T3 = 10 days before planting.

3. DESIGN:
(i) (a) Fact. in R.B.D. (b) N.A. (c) —. (d) (a) 1/47.6 ac. (b) 1/71.43 ac. (v) 1 row all round the plot. (vi) Yes.

4. GENERAL:
(b) Satisfactory. (ii) Nil. (iii) Yield of green leaf, bright leaf and bright leaf equivalent. (iv) to (vii) Nil.

5. RESULTS:
(i) 341 lb./ac. (ii) 242.9 lb./ac. (iii) Main effect of M is significant. (iv) Av. yield of green leaf in lb./ac.
Crop: Tobacco  
Ref: C.T.R.L 54(4)

Site: Cigarette Tobacco Res. Sub-Stn. Farm, Guntur.  
Type: 'M'.

Object: To find out the effect of different combinations of manures given to the rotation crops—groundnut and sorghum on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS:

(i) (a) Groundnut—Sorghum—Fallow—Tobacco.  
(b) Fallow.  
(c) Nil.  
(iii) 12.10.1954.  
(iv) (a) 5 ploughings.  
(b) Transplanting.  
(c) —.  
(d) 33"x33".  
(e) N.A.  
(vi) Nil.  
(vii) Unirrigated.  
(viii) 4 weedicings and 2 intercultures.  
(ix) 7.65".  
(x) 8.1.1955 to 15.2.1955.

2. TREATMENTS:

All combinations of (1), (2) and (3)

(1) 3 levels of manure to groundnut in kharif:  
M₀ = No manure,  
M₁ = 20 lb./ac. of N+30 lb./ac. of P₂O₅,  
M₂ = M₁+60 lb./ac. of F.Y.M.

(2) 2 levels of manure to sorghum in rabi:  
L₀ = No manure and  
L₁ = 20 lb./ac. of N+30 lb./ac. of P₂O₅

(3) 2 levels of N to tobacco:  
N₀ = 0 and  
N₁ = 20 lb./ac.


3. DESIGN:

(i) F.act. in R.B.D.  
(ii) (a) 12.  
(b) N.A.  
(iii) 4.  
(iv) (a) 1/40 ac.  
(b) 1/47.6 ac.  
(v) 1 row all round the plot.  
(vi) Yes.

4. GENERAL:

(i) Satisfactory.  
(ii) Nil.  
(iii) Yield of green leaf, bright leaf and total bright leaf equivalent.  
(iv) (a) 1952—1955.  
(b) and (c) No.  
(v) (a) and (b) No.  
(vi) and (vii) Nil.

5. RESULTS:

(i) 3461 lb./ac.  
(ii) 295.2 lb./ac.  
(iii) Main effect of N and interaction N×L are highly significant.  
(iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>Mean</th>
<th>L₀</th>
<th>L₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>3016</td>
<td>2186</td>
<td>3479</td>
<td>3127</td>
<td>2954</td>
</tr>
<tr>
<td>N₁</td>
<td>3689</td>
<td>3526</td>
<td>3785</td>
<td>3800</td>
<td>3954</td>
</tr>
<tr>
<td>Mean</td>
<td>3552</td>
<td>3556</td>
<td>3482</td>
<td>3463</td>
<td>3459</td>
</tr>
<tr>
<td>L₀</td>
<td>3175</td>
<td>3654</td>
<td>3548</td>
<td>3466</td>
<td></td>
</tr>
</tbody>
</table>
Crop: Tobacco.  

Site: Cigarette Tobacco Res. Sub-Sn. Farm, Guntur.  

Object: -To compare the effect of C/N and A/S on Cigarette Tobacco.  

1. BASAL CONDITIONS:  
   (i) (a) Groundnut—Sorghum—Fallow—Tobacco. (b) Fallow. (c) Nil. (d) Black clay. (e) N.A.  
   (ii) (a) 4 ploughings. (b) Transplanted. (c) —. (d) 33" x 33". (e) N.A.  
   (iii) 4.10.1954. (iv) (a) 3 ploughings. (b) Nil.  

2. TREATMENTS:  
   Main-plot treatments:  
   2 levels of F.Y.M.: F₀ = 0 and F₁ = 6 C.L./ac.  
   Sub-plot treatments:  
   3 sources of 20 lb./ac. of N: N₀ = 0, N₁ = C/N and N₂ = A/S.  

3. DESIGN:  
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot. (b) N.A.  
   (iii) 1 row all round th' plot. (iv) Yes.  

4. GENERAL:  
   (i) Normal. (ii) Nil. (iii) Yield of green leaf, bright leaf and total bright leaf equivalent. (iv) 1952—1954. (b) N.A. (c) Nil. (v) to (vii) Nil.  

5. RESULTS:  
   (i) 3245 lb./ac. (ii) (a) 598.8 lb./ac. (b) 381.2 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of bright leaf in lb./ac.  

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F₀</td>
<td>2662</td>
<td>3341</td>
<td>3024</td>
<td>3039</td>
</tr>
<tr>
<td>F₁</td>
<td>3222</td>
<td>3790</td>
<td>3428</td>
<td>3480</td>
</tr>
</tbody>
</table>

S E. of difference of two  

1. F marginal means = 244.5 lb./ac.  
2. N marginal means = 191.6 lb./ac.  
3. N means at the same level of F = 271.0 lb./ac.  
4. F means at the same level of N = 329.7 lb./ac.  

Crop: Tobacco.  

Site: Cigarette Tobacco Res. Sub-Sn. Farm, Guntur.  

Object: -To compare the effect of C/N and A/S on Tobacco.  

1. BASAL CONDITIONS:  
   (i) (a) Nil. (b) Chillies. (c) 12 C.L./ac. of F.Y.M. (ii) (a) Black clay. (b) N.A. (iii) 20.10.1951. (iv) (a) 5 ploughings. (b) Transplanting. (c) —. (d) 33" x 33". (e) N.A. (v) Nil. (vi) N/A. (vii) Unirrigated. (viii) 3 intercultures and 1 weeding. (ix) 7.65'. (x) 12.2.1955.  

Ref - C.T.R.I. 54(5).
2. **TREATMENTS:**

**Main-plot treatments:**
- 2 levels of F.Y.M.: $F_0 = 0$ and $F_1 = 12$ C.L./ac.

**Sub-plot treatments:**
- 5 levels of $N$: $N_0 = 0$, $N_1 = 30$ lb./ac. as C/N, $N_2 = 60$ lb./ac. as C/N, $N_3 = 30$ lb./ac. as A/S and $N_4 = 60$ lb./ac. as A/S.

3. **DESIGN:**

(i) Split-plot. (ii) 2 main-plots/repetition; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/37 ac. (b) 1/58 8 ac. (v) 1 row all round the plot. (vi) Yes.

4. **GENERAL:**

(i) Normal. (ii) Nil. (iii) Yield of cured leaf. (iv) (a) 1952—54. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**

(i) 1183 lb./ac. (ii) (a) 100.5 lb./ac. (b) 91.1 lb./ac. (iii) Main effect of $N$ alone is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Year</th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>N_3</th>
<th>N_4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1952</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>F</td>
<td>F</td>
<td>1183</td>
</tr>
<tr>
<td>1953</td>
<td>C</td>
<td>F</td>
<td>A/S</td>
<td>F</td>
<td>C</td>
<td>1185</td>
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<tr>
<td>1954</td>
<td>C</td>
<td>F</td>
<td>A/S</td>
<td>F</td>
<td>C</td>
<td>1183</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. F marginal means = 31.8 lb./ac.
2. N marginal means = 45.6 lb./ac.
3. N means at the same level of F = 61.4 lb./ac.
4. F means at the same level of N = 65.8 lb./ac.

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**Crop**: Tobacco.  
**Ref**: C.T.R.I. 54(7).  
**Site**: Cigarette Tobacco Res. Sub-Stn. Farm, Gujurat.  
**Type**: 'M'.

**Object**: To study the direct, residual and cumulative effects of manures on Tobacco.

1. **BASAL CONDITIONS:**

(i) (a) Tobacco after Tobacco. (b) Tobacco. (c) N.A. (d) (a) Black clay. (b) N.A. (iii) 11.10.1954. (iv) (a) 4 ploughings. (b) Transplanting. (c) —. (d) 33' x 33'. (e) N.A. (f) Nil. (g) N.A.– Rat tail. (h) Unirrigated. (ii) 3 intercultures and 2 weedings. (i) 7.65. (ii) 6.2.1955.

2. **TREATMENTS:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Treatment</th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>N_3</th>
<th>N_4</th>
<th>N_5</th>
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<td>C</td>
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<td>F</td>
<td>F</td>
<td>F</td>
<td>A/S</td>
<td>A/S</td>
</tr>
<tr>
<td>1953</td>
<td>C</td>
<td>F</td>
<td>A/S</td>
<td>F</td>
<td>C</td>
<td>A/S</td>
<td>A/S</td>
<td>F</td>
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<tr>
<td>1954</td>
<td>C</td>
<td>F</td>
<td>A/S</td>
<td>F</td>
<td>C</td>
<td>A/S</td>
<td>A/S</td>
<td>F</td>
</tr>
</tbody>
</table>

Residual effect of the above treatments:

C = No manure, $F = 12$ C.L./ac. of F.Y.M., $A/S = 30$ lb./ac. of $N$.

3. **DESIGN:**

(i) R B D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 1/22.3 ac. (b) 1/30.3 ac. (v) 1 row all round the plot. (vi) Yes.

4. **GENERAL:**

(i) Normal. (ii) Nil. (iii) Yield of cured leaf. (iv) (a) 1952—1954. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**

(i) 1004 lb./ac. (ii) 101.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.
Crop → Tobacco.  
Site → Tobacco Res. Sta., Hunsur.  
Type → 'M'.

Object: — To find the effect of coconut oil in suppressing the suckers and its effect on yield.

1. BASAL CONDITIONS:
   (i) (a) to (c) Nil. (ii) (a) Red sandy loam. (b) N.A. (iii) July, 1957. (iv) (a) Ploughing 3 to 4 times. (b) Broadcasting. (c) 3 lb./ac. (d) 33\(^\circ\) × 33\(^\circ\). (e) N.A. (v) Application of V.O.T.F. mixture at 60 gms/plant. (vi) Harrision special. (vii) Unirrigated. (viii) Intercultivation and topping. (ix) N.A. (x) November—December, 1957.

2. TREATMENTS:
   2 manural treatments: M₀ = No application of coconut oil and M₁ = Application of coconut oil in the axils of the leaf on the topped plants.

3. DESIGN:
   (i) R.B.D. (ii) 60 plants/plot. (iii) 6. (iv) and (b) 60 plants/plot. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Endex spraying at 10 yrs. in 5 gallons of water against caterpillar. (iii) No. and weight of suckers and yield of green and cured leaf. (iv) 1957—1962. (b) No. (c) Nil. (d) (a) and (b) N.A. (v) and (vi) Nil.

5. RESULTS:
   Yield of suckers
   (i) 1071 lb./ac. (d) 178.2 lb./ac. (iii) Treatment difference is not significant. (iv) Av. weight of suckers in lb./ac.
   Treatment  M₀  M₁
   Av. yield  1126 1015
   S.E./mean = 72.7 lb./ac.

   Yield of cured leaf
   (i) 516 lb./ac. (ii) 113.6 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of cured leaf in lb./ac.
   Treatment  M₀  M₁
   Av. yield  300 331
   S.E./mean = 46.4 lb./ac.

Crop → Tobacco.  
Site → Tobacco Res. Sta., Hunsur.  
Type → 'M'.

Object: — To study the effect of different forms of N and the optimum combination of N, P and K on the yield of Tobacco.

1. BASAL CONDITIONS:
   (i) Nil. (b) F.O. (c) 20 tons/ac. of F.Y.M. (ii) (a) Red sandy loam. (b) N.A. (iii) 17.11.1959. (iv) (a) 3 to 4 ploughings. (b) Broadcasting. (c) 3 lb./ac. (d) 33\(^\circ\) × 33\(^\circ\). (e) N.A. (v) Nil. (vi) Chondkuf. (vii) Unirrigated. (viii) Topping at 8 leaves level. (ix) Nil. (x) 11.2.1960.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2)
(1) 3 sources of N: S1 = G.N.C., S2 = A/S and S3 = G.N.C.+A/S in equal proportion.
(2) 3 levels of N: N1 = 20, N2 = 40 and N3 = 80 lb/ac.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 levels of P2O5 as Super: P1 = 50 and P2 = 100 lb/ac.
(2) 2 levels of K2O as Potash: K1 = 25 and K2 = 50 lb/ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 9 main-plots/repl.; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 48 plants/plot. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Growth was sub-normal. (ii) Minor insects were controlled by spraying Bordeaux mixture at weekly intervals. (iii) Yield of cured and green leaf. (iv) (a) 1959—1961. (b) No. (c) Nil. (v) (a) and (b) Nil, (vi) Nil. (vii) The crop did not mature in time due to heavy rains and late sowing. N × S table is not available.

5. RESULTS:
(i) 606 lb/ac. (ii) (a) 217.7 lb/ac. (b) 112.7 lb/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of tobacco in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>K1</th>
<th>K2</th>
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</tr>
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<tr>
<td>P1</td>
<td>549</td>
<td>628</td>
<td>590</td>
<td>487</td>
<td>617</td>
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<td>582</td>
<td>596</td>
<td>589</td>
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<td>696</td>
<td>619</td>
<td>646</td>
<td>530</td>
<td>627</td>
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<td>628</td>
<td>693</td>
<td>589</td>
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</table>

S.E. of difference of two
1. N or S marginal means
2. P or K marginal means
3. P or K means at the same level of N or S
4. N or S means at the same level of P or K
S.E. of body of P × K table

Ref: C.T.R.I. 58(1).
Type: 'M'.

Object: To find the effect of coconut oil and other chemicals in suppressing the suckers and its effect on the yield of Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco. (c) Same as (V). (ii) (a) Red sandy loam. (b) N.A. (iii) 13.11.1958. (iv) (a) 3 to 4 ploughings. (b) Broadcasting. (c) 3 lb/ac. (d) 33° × 33°. (e) N.A. (v) Application of V.O.T.F. mixture at 40 gms/plant. (vi) Harrison spread. (vii) Unirrigated. (viii) Inter cultivation and topping. (ix) and (x) N.A.
2. TREATMENTS :

4 chemical treatments: T₀ = Control (hand suckering), T₁ = Naphthalene acetic acid (one drop at the cut end of the stem and spreading uniformly), T₂ = Maleic hydrazide (sprayed on the top of leaf axil), and T₃ = Coconut oil.

3. DESIGN :

(i) R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 50 plants/plot. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Fair. (ii) Enreex spraying at 10 ozs in 5 gallons of water against caterpillars. (iii) No. and wt. of suckers. (iv) 1957-1962 (failed in 1960). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Unirrigated. (viii) Unirrigated. (ix) Interplowing and topping. (x) 22.6'. (xi) 31.2.1959.

5. RESULTS :

(i) 172 lb/ac. (ii) 87.8 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. weight of suckers in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>335</td>
<td>74</td>
<td>252</td>
<td>29</td>
<td>35.8 lb/ac</td>
</tr>
</tbody>
</table>

Crop : Tobacco.  
Site : Tobacco Res. Stn., Hunsur.  
Ref : C.T.R.I. 59(2).  
Type : 'M'.

Object : To find the effect of coconut oil and other chemicals in suppressing suckers and its effect on the yield of Tobacco.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Tobacco. (c) Same as (V). (ii) (a) Red sandy loam. (b) N.A. (iii) 12.6.1959. (iv) (a) 3 to 4 ploughings. (b) Broadcasting. (c) 3 lbs/ac. (d) 33' x 33'. (e) N.A. (v) Application of V.O.T.F. mixture at 40 gms/plant. (vi) Harrison special. (vii) Unirrigated. (viii) Interplowing and topping. (ix) 5.12.1959.

2. TREATMENTS :

4 chemical treatments: T₀ = Control (hand suckering), T₁ = Naphthalene acetic acid 2% (one drop at the cut end of the stem and spreading uniformly), T₂ = Maleic hydrazide 1% (sprayed on the top of 6th leaf axil) and T₃ = Coconut oil (in the axils of the leaf on topped plants).

3. DESIGN :

(i) R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 50 plants/plot. (b) Nil. (vi) Yes.

4. GENERAL :

(i) Subnormal. (ii) Minor insects were controlled by spraying Enderex at 10 ozs in 5 gallons against caterpillars. (iii) No. and weight of suckers and weight of green and cured leaf. (iv) 1957-1962 (expt. failed in 1960). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) The growth was subnormal due to lack of rains.

5. RESULTS :

1. Yield of cured leaf

(i) 867 lb/ac. (ii) 109.2 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>887</td>
<td>917</td>
<td>847</td>
<td>855</td>
<td>44.6 lb/ac</td>
</tr>
</tbody>
</table>

2. Weight of suckers

(i) 63 lb/ac. (ii) 275.8 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of suckers in lb/ac.
Crop: Tobacco (Rahj).

Site: Hookah & Chewing Tobacco Res. Sta., Pusa. Type: 'M'.

Object: To find out the optimum dose of oil cake and inorganic fertilizer for Hookah and Chewing tobacco.

1. BASAL CONDITIONS:
   (i) (a) Maize—Rabar Mixture followed by tobacco. (b) Maize—Rabar mixture. (c) Nil. (ii) (a) Gaonabic alluvium calcareous. (b) N.A. (iii) N.A./30.9.1954 and 1.10.1954. (iv) (a) to (c) N.A. (d) 15'x15'. (e) 1 plant/ hole. (v) G.M. with sannhemp. (vi) Bari Bharao—93 (medium). (vii) Irrigated. (viii) 3 weedicings, 3 hoeings, 1 topping and 6 suckings. (ix) 46.73”. (x) 11.3.1955.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N₀ =0, N₁ =50 and N₂ =100 lb./ac.
   (2) 3 levels of P₂O₅ as Super: P₀ =0, P₁ =30 and P₂ =60 lb./ac.
   (3) 3 levels of K₂O as Pot. Sul.: K₀ =0, K₁ =50 and K₂ =100 lb./ac.
   Half of N was applied as oil cake and ½ of N as A/S.

3. DESIGN:
   (i) 3 conf. (ii) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 54’x24’. (b) 48’x18’. (v) 15’x15’. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Leaf curl, mosaic etc. Removal of affected plants. (iii) Growth, length and breadth of individual leaf. Yield of cured leaf, weight and percentage of various grades. (iv) (a) 1950—1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1837 lb./ac. (ii) 215.1 lb./ac. (iii) Main effect of N and interaction N P K² are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>1621</th>
<th>1622</th>
<th>1621</th>
<th>Mean</th>
<th>1894</th>
<th>1664</th>
<th>1672</th>
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<td>1828</td>
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<td></td>
</tr>
<tr>
<td>N₁</td>
<td>1861</td>
<td>1978</td>
<td>1906</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>N₂</td>
<td>1865</td>
<td>1916</td>
<td>1836</td>
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<table>
<thead>
<tr>
<th></th>
<th>1829</th>
<th>1837</th>
<th>1839</th>
<th>1872</th>
<th></th>
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<td>Mean</td>
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<td></td>
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</tr>
<tr>
<td>K₀</td>
<td>1938</td>
<td>1900</td>
<td>1929</td>
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<td></td>
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<tr>
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<td>1865</td>
<td>1816</td>
<td>1836</td>
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<td></td>
</tr>
<tr>
<td>K₂</td>
<td>1855</td>
<td>1670</td>
<td>1872</td>
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<td></td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 36.4 lb./ac.
S.E. of body of any table = 63.1 lb./ac.

Crop: Tobacco.

Site: Hookah & Chewing Tobacco Res. Sta., Pusa. Type: 'M'.

Object: To find out the effect of fertilizing G.M. crop in Maize and Rahar mixture—Sannhemp—Hookah and chewing tobacco (N. Tabacum) rotation.
1. BASAL CONDITIONS:
(i) (a) Maize-Rahar—Sunnhemp—Tobacco. (b) Maize—Rahar mixture. (c) Nil. (ii) (a) GANgetic alluvium calcareous. (b) N.A. (iii) N.A./26.9.1954. (iv) (a) to (c) N.A. (d) 3' x 2'. (e) 1 plant/ hole. (v) Nil. (vi) Bori bharao—93 (medium). (vii) Irrigated. (viii) 3 weedings, 1 interculturating, topping once and 6 time suckerings. (ix) 46.73°. (x) 14 and 16.2.1955.

2. TREATMENTS:
Maize-plot treatments:
2 levels of G.M.: G_0 = No G.M. (Fallow in kharif) and G_1 = G.M. Sunnhemp (in kharif).
Sub-plot treatments:
4 manurial treatments:
M_1 = No manure in kharif and manure to tobacco at 10 lb./ac. of N and 60 lb./ac. of P_2O_5. M_2 = No manure in kharif and no manure to tobacco. M_3 = Manure applied in kharif at 25 lb./ac. of N and 75 lb./ac. of P_2O_5 to tobacco and M_4 = Manure applied in kharif at 25 lb./ac. of N + 50 lb./ac. of P_2O_5 + No manure to tobacco.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication: 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 42' x 20'. (b) 36' x 16'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:
(i) Crop poor and the stand was also not good. (ii) Leaf curl, mosaic and attack of caterpillars and picking of insects. (iii) Yield of cured leaves and percentage of various grades. (iv) (a) 1954—155. (b) and (c) Nil (v) to (vii) Nil.

5. RESULTS:
(i) 1533 lb./ac. (ii) (a) 426.9 lb./ac. (b) 309.3 lb./ac. (iii) Main effect of M is highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>M_4</th>
<th>Mean</th>
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<td>1643</td>
<td>1452</td>
<td>1494</td>
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<td>G_1 1618</td>
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<tr>
<td>Mean 1680</td>
<td>1319</td>
<td>1650</td>
<td>1529</td>
<td>1513</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. G marginal means = 123.2 lb./ac.
2. M marginal means = 126.3 lb./ac.
3. M means at the same level of G = 176.6 lb./ac.
4. G means at the same level of M = 197.7 lb./ac.


Site: Hookah & Chewing Tobacco Res. Stn., Pusa. Type:—M'.

Object:—To find out the effect of coconut oil in the suppression of suckers and its effect on yield.

1. BASAL CONDITIONS:
(i) (a) Maize—Rahar mixture followed by tobacco. (b) Maize—Rahar mixture. (c) Nil. (ii) (a) GANgetic alluvium calcareous. (b) N.A. (iii) N.A./10.1954. (iv) (a) to (c) N.A. (d) 3' x 2'. (e) 1 plant/ hole. (v) G.M. with sunnhemp. (vi) Bori bharao—93 (medium). (vii) Irrigated. (viii) 3 weedings, 1 interculturating, topping once as usual and 7 times suckerings. (ix) 46.73°. (x) 7.3.1955.

2. TREATMENTS:
3 treatments: T_0 = Control, T_1 = Application of coconut oil to top 5 beds and T_2 = Application of coconut oil to top 8 beds.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 36' x 12'. (b) 30' x 8'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:
(i) Average growth and stand. (ii) Attack of leaf curl, mosaic and caterpillars. Hand picking of larvae. (iii) Yield of cured leaves. Fresh and dry weights of suckers. (iv) (a) 1554—1915. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:

(i) 200 lb./ac.  (ii) 213.3 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_0</th>
<th>T_1</th>
<th>T_3</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2320</td>
<td>2212</td>
<td>2349</td>
<td>87.1 lb./ac.</td>
</tr>
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</table>

Crop: Tobacco.

Ref: C.T.R.I. 54(11).

Site: Hookah & Chewing Tobacco Res. Stn., Pusa. Type: 'M'.

Object: To determine the optimum dose of N and P in relation to topping and spacing of Hookah and Chewing tobacco.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Barley.  (c) Nil.  (d) Gangetic alluvium calcareous.  (e) N.A.  (ii) (a) 22.10.1954.  (b) N.A.  (iii) N.A./22.10.1954.  (iv) (a) to (c) N.A.  (d) As per treatments.  (e) 1 plant/choke.  (f) G.M. with saan hemp.  (g) Bori bharao-93.  (h) 3 weeding, 1 interculturing, topping as usual and 6 times suckering.  (i) 46.73\'.

2. TREATMENTS:

Main-plot treatments:
- 2 spacings: S_1=2'x3' and S_2=2'x3'.

Sub-plot treatments:
- 2 topping treatments: T_1=12 and T_2=14 leaves/plant.

3. DESIGN:

(i) Split-plot.  (ii) 4 main-plots/replication; 2 sub-plots/main-plot and 6 sub-sub-plots/sub-plot.  (iii) 42'.  (iv) 36'x16'.  (v) 3'x2'.  (vi) Yes.

4. GENERAL:

(i) Good.  (ii) Leaf cur!, mosaic and attack of caterpillers.  Hand picking of larvae.  (iii) Yield of cured leaf and percentage of first grade leaf.  (iv) (a) 1954-1955 (in modified form).  (b) N.A.  (c) Nil.  (d) Nil.  (e) Nil.  (f) Nil.  (g) Land subjected to water lodging, hence planting was delayed.

5. RESULTS:

(i) 1539 lb./ac.  (ii) 684.6 lb./ac.  (b) 250.3 lb./ac.  (c) 216.7 lb./ac.  (iii) Main effect of N is highly significant.  Interaction T_x N\_x P is significant.  (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T_0</th>
<th>T_1</th>
<th>T_3</th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>P_0</th>
<th>P_1</th>
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<td>1695</td>
<td>1308</td>
<td>1689</td>
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<td>1573</td>
<td>1703</td>
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<td>S_2</td>
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<td>1492</td>
<td>1122</td>
<td>1479</td>
<td>1718</td>
<td>1426</td>
<td>1453</td>
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</tr>
<tr>
<td>Mean</td>
<td>1481</td>
<td>1594</td>
<td>1213</td>
<td>1584</td>
<td>1817</td>
<td>1500</td>
<td>1578</td>
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<table>
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<th></th>
<th>P_0</th>
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<tbody>
<tr>
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<td>1530</td>
<td>1500</td>
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<td>1658</td>
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<th>N_2</th>
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<td>N_1</td>
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<tr>
<td>N_2</td>
<td>1754</td>
<td>1881</td>
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</tbody>
</table>
Crop: Tobacco (Rabi).

Site: Hookah and Chewing Tobacco Res. Sta., Pusa. Type: 'M'.

Object: To study the effect of different sources of N on the yield and quality of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Maize+Rahar—Tobacco. (b) Maize+Rahar. (c) Nil. (ii) (a) Gangetic alluvium calcareous. (b) N.A. (iii) 4.10.1956. (iv) (a) 1 ploughing by planter Junior cultivator. (b) Transplanting. (c) 2 lb./ac. (d) 3'x2'. (e) 1 G.M. with sanai=500 mds/ac. of F.Y.M. (vi) Bori Bharao—93 (medium). (vii) Irrigated. (viii) 2 weedings, 10 suckering and topping. (ix) 14.00°. (x) 3.3.1957.

2. TREATMENTS:
   5 sources of 50 lb./ac of N: S1=Control, S2=A/S, S3=A/C, S4=A/S+A/C and S5=Mustard cake.

3. DESIGN:
   (i) R.B.D. (ii) (a) 1. (b) N.A. (iii) 4. (iv) (a) 15'x30'. (b) 9'x26'. (v) 3'x2'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Leaf curl and mosaic. (iii) Yield of cured leaf. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Hail storm in January, 1957.

5. RESULTS:
   (i) 2443 lb./ac. (ii) 193.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2163</td>
<td>2401</td>
<td>2487</td>
<td>2611</td>
<td>2554</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>96.7 lb./ac.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Crop: Tobacco.

Site: Hookah and Chewing Tobacco Res. Sta., Pusa. Type: 'M'.

Object: To determine the effect of different organic manures on yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Maize+Rahar. (c) Nil. (ii) (a) Gangetic alluvium calcareous. (b) Nil. (iii) 23.0.1956. (iv) (a) to (c) N.A. (d) 3'x2'. (e) 1 plant/hole. (v) G.M. with sanai=50 lb./ac. of N as A/S. (vi) Bori Bharao—93 (medium). (vii) Irrigated. (viii) 3 weedings, 1 intercutturing, topping as usual and 6 times suckering. (ix) 46.73°. (x) 24.2.1955.

2. TREATMENTS:
   5 sources of 50 lb./ac of N: S1=Mustard cake, S2=Sitera meal, S3=Blood meal, S4=Steamed horn hoof meal and S5=Urea (actually A/S).

As urea was not available, 50 lb./ac of N as A/S was applied.
3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 21' x 20'. (b) 30' x 16'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:
   (i) Poor. (ii) Leaf curl, mosaic and attack of caterpillars. Hand picking of larvae. (iii) Yield of cured leaf. (iv) (a) 1954-1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1752 lb./ac. (ii) 209.72 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

   Treatment: S1  S2  S3  S4  S5
   Av. yield: 1753 1855 1739 1740 1673
   S.E./mean = 85.61 lb./ac.

---

Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Stn., Pusa.
Type: 'M'.

Object: To find out the effect of vegetable oil in the suppression of suckers and on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Maize + Rahar - Tobacco. (b) Maize + Rahar. (c) Nil. (ii) (a) Gangetic alluvium calcareous. (b) N.A. (iii) 12.9.1955. (iv) (a) 1 ploughing by planet Junior cultivator. (b) Transplanting. (c) 2 lb./ac. (d) 3' x 2'. (e) 1. (v) G.M. with sandtemp. (vi) Bari Bharao - 93 (medium). (vii) Irrigated. (viii) 2 weedings and mulching, 9 suckering and topping. (ix) 6.11'. (x) 9.2.1956.

2. TREATMENTS:
   Main-plot treatment: 3 sources of N: S1 = Mustard oil, S2 = Groundnut oil and S3 = Coconut oil.
   Sub-plot treatments: 4 methods of application of N: M0 = Control, M1 = Application to 4 top buds, M2 = Application to 2 top buds and M3 = Application to 8 top buds.

3. DESIGN:
   (i) Split-plot. (ii) 3 main-plots/replcation and 4 sub-plots/main-plot, (b) N.A. (iii) 6. (iv) (a) 21' x 20'. (b) 15' x 30'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Leaf curl and mosaic. (iii) Cured leaf weight. (iv) (a) 1955-1958. (b) No. (c) Nil. (v) (a) and (b) Nil. (vii) and (viii) N.A.

5. RESULTS:
   (i) 1855 lb./ac. (ii) 266.2 lb./ac. (b) 171.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1793</td>
<td>2138</td>
<td>1933</td>
<td>1779</td>
<td>1911</td>
</tr>
<tr>
<td>S2</td>
<td>1873</td>
<td>1860</td>
<td>1788</td>
<td>1863</td>
<td>1846</td>
</tr>
<tr>
<td>S3</td>
<td>1800</td>
<td>1789</td>
<td>1867</td>
<td>1792</td>
<td>1812</td>
</tr>
<tr>
<td>Mean</td>
<td>1822</td>
<td>1929</td>
<td>1863</td>
<td>1811</td>
<td>1856</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. S marginal means = 76.8 lb./ac.
2. M marginal means = 57.1 lb./ac.
3. M means at the same level of S = 98.9 lb./ac.
4. S means at the same level of M = 115.0 lb./ac.
Crop - Tobacco (Rabi).

Site - Hookah and Chewing Tobacco Res. Sta., Pusa.

Object:- To study the effect of vegetable oils in the suppression of suckers on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sannhemp (G.M.). (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 23.9.1957. (iv) (a) Transplanting. (b) G.M. with *sannhemp*. (v) Bori Bharao-10 (medium). (vi) Irrigated. (vii) 1 weeding, topping and suckering. (viii) 6.3.1958.

2. TREATMENTS:
   Same as in exp. no. 55(1) on page 523.

3. DESIGN:
   (i) Split-plot. (ii) 3 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 15'x30'. (b) 9'x20'. (v) Yes.

4. GENERAL:

5. RESULTS:
   (i) 1623 lb./ac. (ii) (a) 369.7 lb./ac. (b) 237.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1717</td>
<td>1611</td>
<td>1671</td>
<td>1716</td>
<td>1681</td>
</tr>
<tr>
<td>S2</td>
<td>1453</td>
<td>1598</td>
<td>1608</td>
<td>1551</td>
<td>1553</td>
</tr>
<tr>
<td>S3</td>
<td>1616</td>
<td>1584</td>
<td>1635</td>
<td>1656</td>
<td>1635</td>
</tr>
<tr>
<td>Mean</td>
<td>1595</td>
<td>1601</td>
<td>1653</td>
<td>1641</td>
<td>1623</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. S marginal means = 106.7 lb./ac.
2. M marginal means = 79.0 lb./ac.
3. M means at the same level of S = 156.9 lb./ac.
4. S means at the same level of M = 159.5 lb./ac.
4. GENERAL:
(i) Good. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 199 lb./ac. (ii) (a) 306.7 lb./ac. (b) 319.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>1956</td>
<td>2061</td>
<td>2251</td>
<td>1940</td>
<td>2032</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>1956</td>
<td>2103</td>
<td>1835</td>
<td>1726</td>
<td>1905</td>
</tr>
<tr>
<td>( S_3 )</td>
<td>2161</td>
<td>2022</td>
<td>1975</td>
<td>1897</td>
<td>2014</td>
</tr>
<tr>
<td>Mean</td>
<td>2024</td>
<td>2062</td>
<td>2020</td>
<td>1854</td>
<td>1990</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. S marginal means = 88.5 lb./ac.
2. M marginal means = 106.6 lb./ac.
3. M means at the same level of S = 184.7 lb./ac.
4. S means at the same level of M = 182.8 lb./ac.

Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Sta., Pusa.
Type: 'M'.

Object: To study the effect of vegetable oils in the suppression of suckers on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS.
(i) (a) Nil. (b) Sandhemp (G.M.). (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 16.9.1956. (iv) (a) 5 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 2 x 2'. (e) (vi) G.M. with sandhemp. (vii) D.F.—401. (viii) Irrigated. (ix) 2 weedings, topping and suckering. (x) 7.1'. (a) 12.2.1959.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 55(1) on page 525.

4. GENERAL:
(i) Good. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 234 lb./ac. (ii) (a) 257 lb./ac. (b) 167 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>2254</td>
<td>2268</td>
<td>2176</td>
<td>2300</td>
<td>2250</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>2230</td>
<td>2193</td>
<td>2203</td>
<td>2230</td>
<td>2214</td>
</tr>
<tr>
<td>( S_3 )</td>
<td>2243</td>
<td>2225</td>
<td>2297</td>
<td>2363</td>
<td>2282</td>
</tr>
<tr>
<td>Mean</td>
<td>2252</td>
<td>2229</td>
<td>2225</td>
<td>2298</td>
<td>2249</td>
</tr>
</tbody>
</table>
Crop: Tobacco (Rabi).  
Site: Hookah and Chewing Tobacco Res. Sta., Pusa.  
Type: - 'M'.

Object: — To find out the effect of fertilizing G.M. crop and Tobacco crop as compared to farmer's method of manuring with F.Y.M.

1. BASAL CONDITIONS:
   (i) (a) Maize + Rabar — Tobacco.  
       (b) Maize — Rabar.  
       (c) Nil.  
   (ii) (a) Ganges alluvium calcareous.  
       (b) N.A.  
   (iii) 28.9.1955.  
   (iv) (a) 1 ploughing by plant junior cultivator.  
       (b) Transplanting.  
       (c) 2 lb/ac.  
       (d) 3'X2'.  
   (e) 1.  
   (vi) Nil.  
   (vii) Bori Bharao—93 (medium).  
   (viii) Irrigated.  
   (ix) 3 times weeding and mulching, 9 suckerings and topping.  
   (x) 6.11'.  
   (k) 2.3.1956.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Kharif</th>
<th>Crop</th>
<th>Manure</th>
<th>Rabi</th>
<th>Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>Fallow</td>
<td>Nil</td>
<td>Tobacco</td>
<td>50 C.L./ac. of F.Y.M.</td>
</tr>
<tr>
<td>T2</td>
<td>Fallow</td>
<td>Nil</td>
<td>Tobacco</td>
<td>50 C.L./ac. of F.Y.M.+25 lb./ac. of N as mustard cake.</td>
</tr>
<tr>
<td>T3</td>
<td>Fallow</td>
<td>Nil</td>
<td>Tobacco</td>
<td>50 C.L./ac. of F.Y.M.+50 lb./ac. of N as mustard cake+5 lb./ac. of P2O5.</td>
</tr>
<tr>
<td>T4</td>
<td>Fallow</td>
<td>Nil</td>
<td>Tobacco</td>
<td>50 C.L./ac. of F.Y.M.+100 lb./ac. of N as mustard cake+5 lb./ac. of P2O5.</td>
</tr>
<tr>
<td>T5</td>
<td>Sannhemp</td>
<td>Nil</td>
<td>Tobacco</td>
<td>G.M. with sannhemp+50 lb./ac. of N as A/S+5 lb./ac. of P2O5.</td>
</tr>
<tr>
<td>T6</td>
<td>Sannhemp</td>
<td>30 lb./ac. of P2O5</td>
<td>Tobacco</td>
<td>G.M. with sannhemp+50 lb./ac. of N as A/S+5 lb./ac. of P2O5.</td>
</tr>
<tr>
<td>T7</td>
<td>Sannhemp</td>
<td>Nil</td>
<td>Tobacco</td>
<td>G.M. with sannhemp+100 lb./ac. of N as A/S+10 lb./ac. of P2O5.</td>
</tr>
<tr>
<td>T8</td>
<td>Sannhemp</td>
<td>60 lb./ac. of P2O5</td>
<td>Tobacco</td>
<td>G.M. with sannhemp+100 lb./ac. of N as A/S+10 lb./ac. of P2O5.</td>
</tr>
</tbody>
</table>

P2O5 was applied as Super.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 8.  
   (b) N.A.  
   (iii) 6.  
   (iv) (a) 18'X30'.  
   (b) 12'X32'.  
   (v) 3'X2'.  
   (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  
   (ii) Leaf curl and mosaic.  
   (iii) Cured leaf yield.  
   (iv) (a) 1955—1958.  
   (b) No.  
   (c) Nil.  
   (vi to (vii) Nil.

5. RESULTS:
   (i) 2235 lb./ac.  
   (ii) 197.7 lb./ac.  
   (iii) Treatment differences are highly significant.  
   (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>Av yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2034</td>
<td>2015</td>
<td>2400</td>
<td>2559</td>
<td>2153</td>
<td>1693</td>
<td>2408</td>
<td>2350</td>
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</tr>
</tbody>
</table>

S.E./mean = 81.3 lb./ac.
Crop :- Tobacco (Rabi).  
Site :- Hookah and Chewing Tobacco Res. Stn., Pusa.  
Type :- 'M'.  

Object :— To find out the effect of fertilizing the G.M. crop and Tobacco crop as compared to farmer's practice of manuring with F.Y.M. on Tobacco.

1. BASAL CONDITIONS:
   (i) Nil to (c) As per treatments.  (ii) (a) Gangetic alluvium calcareous.  (b) N.A.  (iii) Maize+Rahar.  (c) Nil.  (iv) 2 ploughings.  (b) Transplanting.  (c) 4 lb/ac.  (d) 3'x2'.  (e) 1.  (v) Nil.  (vi) Bari bharao—93 (medium).  (vii) Irrigated.  (viii) 3 times weeding and mulching, 7 suckerings and topping.  (ix) 14.00°.  (x) 4.3.1957.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 55(2) on page 528.

4. GENERAL:
(i) Good.  (ii) Leaf curl and mosaic.  Aphid attack and Endrin 19.5% sprayed.  (iii) Cured leaf yield.  (iv) (a) 1955—1958.  (b) No.  (c) Nil.  (v) (a) and (b) Nil.  (vi) 1.  (vii) 49.28°.  (viii) 4.3.1957.

5. RESULTS:
(i) 1966 lb/ac.  (ii) 230.5 lb/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of cured leaf in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1975</td>
<td>1908</td>
<td>1874</td>
<td>2163</td>
<td>1835</td>
<td>1954</td>
<td>2013</td>
<td>2018</td>
</tr>
</tbody>
</table>

S.E./mean = 94.1 lb/ac.
Crop: Tobacco (Rabi).

Ref.: G.T.R.I. 58(3).

Site: Hookah and Chewing Tobacco Res. Sta., Pusa.

Type: 'M'.

Object: To find out the effect of fertilizing the G.M. crop and Tobacco crop as compared to farmer's practice of manuring with P.Y.M. on Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) Nil. (ii) (a) Indus-ganga alluvium calcareous. (b) N.A. (iii) 24-9-1958. (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3'x2'. (e) L. (f) Nil. (g) D.P.--401. (h) Irrigated. (i) 2 weeding, topping and suckering. (ix) 7.0'. (x) 18.2.1959.

2. TREATMENTS:
   Same as in exp. no. 53(2) on page 528.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 35'x68'. (b) 30'x64'. (v) 3'x2'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Leaf spot disease. (iii) Cured leaf yield. (iv) (a) 1955-1958. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2693 lb./ac. (ii) 266.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
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<tr>
<td>Av. yield</td>
<td>2581</td>
<td>2675</td>
<td>2691</td>
<td>2611</td>
<td>2577</td>
<td>2604</td>
<td>2800</td>
<td>2806</td>
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<tr>
<td>S.E./mean</td>
<td>108.9 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Crop: Tobacco (Rabi).


Site: Hookah and Chewing Tobacco Res. Sta., Pusa.

Type: 'M'.

Object: To study the effect of different fertilizers on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize+Rabar. (c) Nil. (ii) (a) Indo-ganga alluvium calcareous. (b) N.A. (iii) 24.9.1957. (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3'x2'. (e) 1. (f) 50 C.L./ac. of F.Y.M. (g) Bori Bhara-10. (h) Irrigated. (i) 1 weeding, topping and suckering. (ii) N.A. (iii) 14.2.1958.

2. TREATMENTS:
   8 sources of 50 lb./ac. of N : S0=Control, S1=A/S, S2=A/C, S3=A/S+A/C, S4=Mustard cake, S5=Nitrophoska green, S6=C/A/N and S7=Nitrophoska green+C/A/N.

As Nitrophoska green and C/A/N were not received in time for application, the last three treatments become control plots. So, there were four control plots in each replication.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 15'x30'. (b) 9'x26'. (v) 3'x2'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Leaf curl and mosaic. (iii) Yield of cured leaf. (iv) (a) 1957-1961. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1861 lb./ac. (ii) 256.8 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>1726</td>
<td>1934</td>
<td>1794</td>
<td>2195</td>
<td>2161</td>
</tr>
<tr>
<td>S.E. of Sa mean</td>
<td>52.4 lb./ac.</td>
<td>S.E./mean (other than S4)</td>
<td>104.8 lb./ac.</td>
<td></td>
<td></td>
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</table>
Crop :- Tobacco (Rabi).
Site :- Hookah and Chewing Tobacco Res. Stn., Pusa. Type :- 'M'.

Object :- To study the effect of different fertilizers on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 5.10.1958.
(iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3'x2'. (e) 1. (v) N.A. (vi) D.P.---401. (vii) Irrigated. (viii) 2 weedings, topping and suckering. (ix) 7.0'. (x) 12.3.1959.

2. TREATMENTS to 4. GENERAL :
Same as in expt. no. 57(4) on page 530.

5. RESULTS :

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S_6</th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
<th>S_5</th>
<th>S_7</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2109</td>
<td>2657</td>
<td>2753</td>
<td>3010</td>
<td>2658</td>
<td>3201</td>
<td>2942</td>
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<tr>
<td>S.E./mean</td>
<td>207.3 lb./ac.</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

Crop :- Tobacco (Rabi).
Ref :- C.T.R.I. 35(3).
Site :- Hookah and Chewing Tobacco Res. Stn., Pusa. Type :- 'M'.

Object :- To study the effect of different doses of organic and inorganic manures on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 22.9.1559.
(iv) (a) 5 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3'x2'. (e) 1. (v) G.M. with sannhemp. (vi) D.P.---401. (vii) Irrigated. (viii) 4 weedings, topping and suckering. (ix) N.A. (x) 6.3.1960.

2. TREATMENTS to 4. GENERAL :
Same as in expt. no. 57(4) on page 530.

5. RESULTS :

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S_6</th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
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<tr>
<td>Av. yield</td>
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<td>1204</td>
<td>1212</td>
<td>1179</td>
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<tr>
<td>S.E./mean</td>
<td>79.6 lb./ac.</td>
<td></td>
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Crop :- Tobacco (Rabi).
Ref :- C.T.R.I. 57(5).
Site :- Hookah and Chewing Tobacco Res. Stn., Pusa. Type :- 'M'.

Object :- To study the effect of different doses of organic and inorganic manures on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Maize+Rahar. (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 5.10.1957.
(iv) (a) 5 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3'x2'. (e) 1. (v) Nil. (vi) Bori Bharat--10. (vii) Irrigated. (viii) 1 weedings, topping and suckering. (ix) 49.3'. (x) 10.3.1958.
2. TREATMENTS:

Main-plot treatments:
3 levels of organic manures: F₁ = 50 C.L./ac. of F.Y.M.; F₂ = 35 C.L./ac. of F.Y.M.+G.M. and F₃ = 50 C.L./ac. of F.Y.M.+G.M.

Sub-plot treatments:
All combinations of (1) and (2) + one control
(1) 3 levels of N: N₁ = 50, N₂ = 100 and N₃ = 150 lb./ac.
(2) 5 sources of N: S₁ = A/S, S₂ = Uncomposted mustard cake, S₃ = A/S + 1/4 uncomposted mustard cake, S₄ = Composted mustard cake and S₅ = A/S + 1/4 composted mustard cake.

3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/replication; 16 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 15' x 30', (b) 9' x 26', (v) 3' x 2'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1937-1939. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1816 lb./ac. (ii) (a) 491.1 lb./ac. (b) 272.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
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<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>Mean</th>
<th>F₁</th>
<th>F₂</th>
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<tr>
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<td>1732</td>
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<td>1713</td>
<td>1731</td>
<td>1726</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. F marginal means = 103.5 lb./ac. 5. F means at the same level N = 131.6 lb./ac.
2. N marginal means = 57.5 lb./ac. 6. S means at the same level of F = 128.5 lb./ac.
3. S marginal means = 74.2 lb./ac. 7. F means at the same level of S = 154.7 lb./ac.
4. N means at the same level of F = 99.6 lb./ac. S.E. of body of S x N table or control mean = 157.4 lb./ac.

Crop -> Tobacco (Rabi).
Site -> Hookah and Chewing Tobacco Res. Stn., Fussa.
Type -> 'M'.
RESULTS:
(i) 3010 lb./ac. (ii) 1131.8 lb./ac. (b) 290.1 lb./ac. (iii) Only 'control vs. others' effect is highly significant.
(iv) Av. yield of cured leaf in lb./ac.

Crop :- Tobacco (Rai).
Site :- Hookah and Chewing Tobacco Res. Sta., Pusa.
Object :- To study the effect of different doses of organic and inorganic manures on the yield and quality of Hookah and Chewing Tobacco.

1. BASEL CONDITIONS:
   (i) (a) Nil. (b) Sandemp. (c) Nil. (d) (a) Indo-gangetic alluvium calcareous. (b) N.A. (ii) 20.9.1959.
   (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3 x 2'. (e) 1. (v) Top dressing with A/S and mustard cake. (vi) D P. - 461. (viii) 4 weedings, topping and suckering. (ix) 19.6'. (x) 24.2.1960.

2. TREATMENTS to 4. GENERAL:
   same as in exp. no. 57(S) on page 531.

5. RESULTS:
   (i) 3010 lb./ac. (ii) 1131.8 lb./ac. (b) 290.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

### Control = 2538 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>Mean</th>
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<th>F2</th>
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<tr>
<td>N2</td>
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<td>3068</td>
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<td>N3</td>
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<td>3055</td>
<td>3042</td>
<td>2976</td>
<td>3037</td>
<td>3113</td>
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</tbody>
</table>

S.E. of difference of two
1. F marginal means = 238.6 lb./ac. 5. F means at the same level of S = 268.1 lb./ac.
2. S marginal means = 79.0 lb./ac. 6. N means at the same level of F = 105.9 lb./ac.
3. N marginal means = 61.2 lb./ac. 7. F means at the same level of N = 253.8 lb./ac.
4. S means at the same level of F = 156.7 lb./ac. S.E. of body of N x S table or control mean = 167.5 lb./ac.
Crop: Tobacco (Rabi).

Site: Hookah and Chewing Tobacco Res. Stn., Pusa.

Ref: C.T.R.L 57(6).

Type: 'M'.

Object: To study the effect of deep placement of fertilizers on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 8.10.1957. (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3' X 2'. (e) One. (v) G.M. with sannhemp. (vi) Bori bharao-10. (vii) Irrigated. (viii) Weeding, topping and suckering. (ix) 49.3°. (x) 12.3.1958.

2. TREATMENTS:
   All combinations of (1) and (2)
   2 doses of fertilizers: F₁=100 lb./ac. of N as A/S+I as mustard cake and F₂=100 lb./ac. of N as A/S+100 lb./ac. of P₂O₅ as Super+60 lb./ac. of K₂O as Pot.

   (2) 3 methods of application of fertilizers: 
      M₁=Mustard cake to be applied before planting and A/S to be applied one month after planting, 
      M₂=Fertilizers to be applied at a depth of 4' in 4 holes at a distance of 4' from the plant and M₃=M₁ of the fertilizers to be broadcasted and I to be applied as in M₂.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) 2. (iii) 4. (iv) 15' X 30'. (b) 9' X 26'. (v) 3' X 2'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1957-1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2474 lb./ac. (ii) 233.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
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<td>2399</td>
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</tr>
<tr>
<td>Mean</td>
<td>2418</td>
<td>2623</td>
<td>2382</td>
<td>2474</td>
</tr>
</tbody>
</table>

S.E. of F marginal mean = 66.6 lb./ac.
S.E. of M marginal mean = 81.6 lb./ac.
S.E. of body of table = 115.4 lb./ac.

---

Crop: Tobacco (Rabi).

Site: Hookah and Chewing Tobacco Res. Stn., Pusa.

Ref: C.T.R.L 58(5).

Type: 'M'.

Object: To study the effect of deep placement of fertilizers on the yield and quality of Hookah and Chewing Tobacco.
1. **BASAL CONDITIONS:**

   (i) (a) Nil. (b) Sannahemp (G.M.). (c) Nil. (ii) (a) Indo gangetic alluvium calcareous. (b) N.A. (iii) 29.9.1958. (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb/ac. (d) 3'×2'. (e) One. (v) G.M. with sannahemp. (vi) D.P.—401. (vii) Irrigated. (viii) 3 weeding, topping and suckering. (ix) 7.0". (x) 27.2.1959.

2. **TREATMENTS to 4. GENERAL:**

   Same as in expt. no. 57(6) on page 534.

3. **RESULTS:**

   (i) 3152 lb/ac. (ii) 247.9 lb/ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>$M_1$</th>
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</tr>
<tr>
<td>Mean</td>
<td>3028</td>
<td>3191</td>
<td>3237</td>
<td>3132</td>
</tr>
</tbody>
</table>

S.E. of $F$ marginal mean = 71.5 lb/ac.
S.E. of $M$ marginal mean = 87.6 lb/ac.
S.E. of body of table = 123.9 lb/ac.

---

**Crop:** Tobacco *(Rabi).*

**Site:** Hookah and Chewing Tobacco Res. Sta., Pusa.

**Ref:** C.T.R.L. 59(5).

**Type:** 'M'.

**Object:** To study the effect of deep placement of fertilizers on the yield and quality of Hookah and Chewing Tobacco.

1. **BASAL CONDITIONS:**

   (i) (a) NIL. (b) Sannahemp (G.M.). (c) NIL. (ii) (a) Indo gangetic alluvium calcareous. (b) N.A. (iii) 29.9.1959. (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb/ac. (d) 3'×2'. (e) One. (v) G.M. with sannahemp. (vi) D.P.—401. (vii) Irrigated. (viii) 3 weeding, topping and suckering. (ix) 19.3". (x) 26.2.1960.

2. **TREATMENTS to 4. GENERAL:**

   Same as in expt. no. 57(6) on page 534.

3. **RESULTS:**

   (i) 2859 lb/ac. (ii) 265.8 lb/ac. (iii) Only main effect of $F$ is significant. (iv) Av. yield of cured leaf in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>$M_1$</th>
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<td>2908</td>
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S.E. of $F$ marginal mean = 76.7 lb/ac.
S.E. of $M$ marginal mean = 94.0 lb/ac.
S.E. of body of table = 132.9 lb/ac.
Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Sta., Pusa. Type: 'M'.

Object: To determine the effect of organic and inorganic manures on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Maize + Rahar—Tobacco. (b) Maize + Rahar mixture. (c) Nil. (ii) (a) Gangetic alluvium calcareous. (b) N.A. (iii) 3.10.1956. (iv) (a) 1 ploughing by planet Junior cultivator. (b) Transplanting. (c) 2 lb./ac. (d) 3'x2'. (e) 1. (v) Nil. (vi) Bori bharao—93 (medium). (vii) Irrigated. (viii) 3 times weeding and mulching, 9 suckering and topping. (ix) 14.00'. (x) 1.3.1957.

2. TREATMENTS:
   Main-plot treatments:
   2 types of basal dressing: B₁=B.Y.M. and B₂=G.M. (Sanathemp).
   Sub-plot treatments:
   9 sources of N: S₉=Control (no nitrogen), S₄=A/S, S₅=A/S/N, S₆=C/N, S₇=Stere meal, S₈=Blood meal, S₉=Urea, S₁₀=Horn and hoof meal and S₁₁=Mustard cake. Levels of N is not available.

3. DESIGN:
   (i) Split plot. (ii) (a) 2 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 21'x42', (b) 15'x38', (v) 3'x2'. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Leaf curl and mosaic. (iii) Cured leaf weight. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2038 lb./ac. (ii) (a) 586.8 lb./ac. (b) 266.1 lb./ac. (iii) Main effect of S is highly significant and that of B is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>S₉</th>
<th>S₁₀</th>
<th>S₄</th>
<th>S₅</th>
<th>S₆</th>
<th>S₇</th>
<th>S₈</th>
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<td>2236</td>
<td>2349</td>
<td>2465</td>
<td>2496</td>
<td>2176</td>
<td>2055 2144 2092</td>
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<tr>
<td>B₂</td>
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<td>1959</td>
<td>1841</td>
<td>1775</td>
<td>1858 1615 1971</td>
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<tr>
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<td>2115</td>
<td>2212</td>
<td>2169</td>
<td>1976</td>
<td>1957 1880 2032</td>
<td>2038</td>
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S.E. of difference of two
1. B marginal means = 112.9 lb./ac.
2. S marginal means = 108.6 lb./ac.
3. S means at the same level of B = 153.6 lb./ac.
4. B means at the same level of S = 183.7 lb./ac.

Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Sta., Pusa. Type: 'M'.

Object: To determine the effect of organic and inorganic manures on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Maize and Rahar mixture—Tobacco. (b) Maize and Rahar mixture. (c) Nil. (ii) (a) Gangetic alluvium calcareous. (b) N.A. (iii) 3.10.1956. (iv) (a) 1 ploughing by planet Junior cultivator. (b) Transplanting. (c) 2 lb./ac. (d) 3'x2'. (e) 1. (v) Nil. (vi) Bori bharao—93 (medium). (vii) Irrigated. (viii) 5 times weeding and mulching, topping and suckering. (ix) 14.00'. (x) 1.3.1957.

2. TREATMENTS:
   Same as in exp. no. 55(3) above.
3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 15’×30’. (b) 9’×26’. (v) 3’×2’. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Leaf curl and mosaic. (iii) Yield of cured leaf. (iv) (a) 1955–1959. (b) Nil. (c) Nil. (v) (a) and (b) Nil. (vi) Hail storm in January, 1957. (vii) Nil

5. RESULTS:
(i) 1613 lb./ac. (ii) 1963 lb./ac. (b) 2310 lb./ac. (iii) Only main effect of S is highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
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<th></th>
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<th>S_3</th>
<th>S_4</th>
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<td>1592</td>
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</tbody>
</table>

S.E. of difference of two
1. B marginal means = 76.3 lb./ac.
2. S marginal means = 94.1 lb./ac.
3. S means at the same level of B = 138.0 lb./ac.
4. B means at the same level of S = 146.8 lb./ac.

Crop = Tobacco (Rabì).  
Ref = C.T.R.I. 57(7).  
Site = Hookah and Chewing Tobacco Res. Stn., Pusa. Type = 'M'.

Object = To determine the effect of different organic and inorganic manures on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS:
(a) Nil. (b) As per treatments. (c) Nil. (d) Indigo-gangetic alluvium calcareous. (b) N.A. (f) 30.9.1957. (v) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3’×2’. (e) 1. (v) Nil. (v) Bori Marno–10. (vi) Irrigated. (vii) 1 weeding, topping and suckering. (vi) 49.28’. (vii) 2.3.1958.

2. TREATMENTS:
Same as in exp. no. 55(3) on page 536.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 15’×30’. (b) 9’×26’. (v) 3’×2’. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1955–1959. (b) Nil. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2213 lb./ac. (ii) (a) 358.3 lb./ac. (b) 292.9 lb./ac. (iii) Only main effect of S is highly significant. (iv) Av. yield of cured leaf in lb./ac.
Object:—To study the effect of different organic and inorganic manures on yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) As per treatment. (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) N.A. (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3'×2'. (e) 1. (v) Nil. (vi) D.P.—401. (vii) Irrigated. (viii) 2 weedings, topping and suckering. (ix) 7.0'. (x) 1.3.1959.

2. TREATMENTS:
   Same as in expt. no. 55(3) on page 536.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 15'×30'. (b) 9'×26'. (v) 3'×2'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) Yes. (vi) Nil.

5. RESULTS:
   (i) 2155 lb./ac. (ii) (a) 395.2 lb./ac. (b) 264.4 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
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S.E. of difference of two
1. B marginal means = 103.6 lb./ac.
2. S marginal means = 119.6 lb./ac.
3. S means at the same level of B = 169.1 lb./ac.
4. B means at the same level of S = 165.7 lb./ac.
Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Sta., Pass. Type: "M".

Object: To study the effect of different organic and inorganic manures on the yield and quality of Hookah and Chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Indo-Gangetic alluvium calcareous. (b) N.A. (iii) 21.9.1959.
   (iv) (a) 3 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3' x 2'. (e) 1. (f) Nil. (g) D.F.-401. (h) Irrigated. (i) 6 weedings. (j) 19.27°. (k) 29.2.1960.

2. TREATMENTS:
   Same as in exp. no. 55(3) on page 536.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 15' x 30'. (b) 9' x 26'. (c) 3' x 2'. (v) Yes.

4. GENERAL:
   (i) Good. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1955-1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1170 lb./ac. (ii) (a) 138.5 lb./ac. (b) 125.0 lb./ac. (iii) Main effect of B is significant and that of S is highly significant. (iv) Av. yield of cured leaf in lb./ac.

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S.E. of difference of two

1. B marginal means = 26.7 lb./ac.
2. S marginal means = 55.1 lb./ac.
3. S means at the same level of B = 77.9 lb./ac.
4. B means at the same level of S = 78.2 lb./ac.

Crop: Tobacco.
Site: Central Tobacco Res. Inst., Rajahmundry. Type: "M".

Object: To compare the effect of C/N, A/S and A/S/N on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco. (b) Tobacco. (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) 17.11.1954. (iv) (a) 6 ploughings with country plough. (b) to (e) N.A. (f) Nil. (g) Chakam. (h) Unirrigated. (i) One interculture with planet junior and three hand weedinga. (j) 6.24°. (k) 26.1.1955 to 10.3.1955.
2. TREATMENTS:
All combinations of (1) and (2) + control (2 plots)
(1) 4 sources of N: $S_1 = A/S, S_2 = C/N, S_3 = A/S/N$ and $S_4 = Urea$.
(2) 2 levels of N: $N_0 = 20$ and $N_2 = 40$ lb./ac.
Fertilizers were applied in furrows, opened by plough, a week before transplanting.

3. DESIGN:
(i) R.B.D. (ii) N.A. (iii) 4. (iv) (a) $22' \times 38'6"$. (b) $15'6" \times 33'$. (v) $2'9" \times 2'9"$. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Green, cured leaf weight and the proportion of different grades of cured leaf. Counts of flowerheads per plant. Dry weight of seed capsules and stalk. (iv) to (vii) Nil.

5. RESULTS:
(i) 4168 lb./ac. (ii) 690.0 lb./ac. (iii) 'Control vs. others' effect alone is highly significant. (iv) Av. yield of green leaf in lb./ac.

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Mean: 4244
Mean of S marginal mean: 4355
Mean of N marginal mean: 243.9 lb./ac.
Mean of body of table: 172.5 lb./ac.

Crop: Tobacco.  
Ref: C.T.R.I. 54(14).
Site: Central Tobacco Res. Inst., Rajahmundry. Type: 'M'.

Object: To find out whether soil pH and availability of manures under local conditions are influenced by application of sulphur on the yield of Cigarette Tobacco.

1. BASAL CONDITIONS:
(i) (a) Tobacco—Tobacco. (b) Tobacco. (c) Nil. (ii) (a) Deep black soil. (b) Nil. (iii) 19.10.1954. (iv) (a) 4 ploughings with country plough. (b) to (e) N.A. (v) Nil. (vi) Harrison special. (vii) Unirrigated. (viii) 3 intercultures with planet junior and 2 hand weedings. (ix) 6.24'. (x) 5.1.1955 to 10.2.1955.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S: $N_0 = 0, N_1 = 20$ and $N_2 = 40$ lb./ac.
(2) 3 sources of P: $P_0 = 0, P_1 = Kudada phosphate, P_2 = Super$.
(3) 2 levels of Sulphur applied in 1953—1954: $S_0 = 0$ and $S_1 = 560$ lb./ac.

3. DESIGN:
(i) $3 \times 2$ partially confd. (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) $16'6" \times 44'$. (b) $11'6" \times 33'6"$. (v) $2'9" \times 2'9"$. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Green leaf yield. (iv) to (vii) Nil.

5. RESULTS:
(i) 6784 lb./ac. (ii) 569.0 lb./ac. (iii) Main effect of N is highly significant and interaction N x P is significant. (iv) Av. yield of green leaf in lb./ac.
Object: To study the effect of time of application of A/S on cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) Nil. (ii) (a) Deep black soil. (b) N.A. (iii) 16.10.1954.
   (iv) (a) 6 ploughings with country plough. (b) to (e) N.A. (v) Nil. (vi) Chatham. (vii) Unirrigated.
   (viii) 2 intercultures with planet junior and 1 hand weeding. (ix) 6.2.4". (x) 9.1.1955 to 2.2.1955.

2. TREATMENTS:
   All combinations of (1) and (2)+control (2 plots)
   (1) 2 levels of N as A/S: N1 = 20 and N2 = 40 lb./ac.
   (2) 2 times of application of N: T1 = Early application during August and T2 = Late application a fortnight before transplanting.

3. DESIGN:
   (i) R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) 22'x49'6". (b) 16'6"x44'. (v) 29"x29". (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Green leaf yield. (iv) to (vii) Nil.

5. RESULTS:
   (i) 430 lb./ac. (ii) 611.0 lb./ac. (iii) Main effect of N and "control vs. others" are highly significant. (iv) Av. yield of green leaf in lb./ac.

   Control = 5631 lb./ac.

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   S.E. of any marginal mean or control mean = 170.4 lb./ac.
   S.E. of body of table = 249.5 lb./ac.
Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.

Object: To study the effect of fertilizers on chemical composition of flue-cured Virginia Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) 20 lb./ac. of N as A/S.
   (ii) (a) Deep black soil. (b) N.A. (iii) 3.11.1954.
   (iv) 4 to 5 ploughings. (b) Transplanting. (a) N.A. (d) 33° x 33°. (e) N.A. (v) Nil. (vi) Harrison (medium). (vii) Unirrigated. (viii) 4 interculturings with hoe. Weeding and removal of Orobanche as and when necessary. (ix) 0.58°. (x) 21.1.1956 to 1.3.1955.

2. TREATMENTS:
   Main-plot treatments:
   - 5 manurial treatments: M₀ = Control, M₁ = Pot. sul. at 50 lb./ac. of K₂O. M₂ = Super at 50 lb./ac. of P₂O₅. M₃ = M₂ + M₄ and M₄ = F.Y.M. at 600 lb./ac.
   Sub-plot treatments:
   - 4 sources of 20 lb./ac of N: S₀ = Control, S₁ = Blood meal, S₂ = Horn hoof meal and S₃ = Stera meal. N applied as top dressing.

3. DESIGN:
   (i) Split-plot. (ii) (a) 5 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 22° x 11°. (b) 16° x 16°. (v) 2° x 2°. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of green leaf and bright leaf. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 375 lb./ac. (ii) (a) 1549.4 lb./ac. (b) 1067.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of green leaf in lb./ac.

<table>
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S.E. of difference of two treatments:
1. M marginal means = 547.8 lb./ac.
2. S marginal means = 337.9 lb./ac.
3. S means at the same level of M = 755.2 lb./ac.
4. M means at the same level of S = 853.2 lb./ac.
5. RESULTS:
(i) 4198 lb./ac. (ii) (a) 1948.0 lb./ac. (b) 535.7 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of green leaf in lb./ac.

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S.E. of difference of two
1. M marginal means = 370.8 lb./ac.
2. S marginal means = 169.4 lb./ac.
3. S means at the same level of M = 378.5 lb./ac.
4. M means at the same level of S = 495.0 lb./ac.

Site: Central Tobacco Res. Inst., Rajahmundry. Type: "M'.

Object: To investigate the influence of fertilizers on the yield of flue-cured Virginia Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco, (c) 20 lb./ac. of N as A/S. (ii) (a) Deep black soil. (b) N.A. (iii) 2.11.1954. (iv) (a) 4 to 5 pipaugings. (b) Transplanting. (c) N.A. (d) 33'×33'. (e) N.A. (v) Nil. (vi) Chatmarn. (vii) Unirrigated. (viii) 2 interculturings with hoe. Weeding and removal of orobanchus as and when necessary. (ix) 0.53. (x) 18.1.1955 to 28.2.1955.

2. TREATMENTS:
Main-plot treatments: M₀=Control, M₁=Pot. Sul. at 50 lb./ac. of K₂O, M₄=Super at 50 lb./ac. of P₂O₅, M₅=M₃+M₄ and M₆=F.Y.M. at 6000 lb./ac.
Sub-plot treatments: 5 sources of 20 lb./ac. of N as top dressing: N₀=Control, N₁=A/S, N₂=C/N, N₃=A/S/N and N₄=Urea.
F.Y.M. broadcast one month before transplanting, other fertilizers applied in 6" to 8" deep in furrows a fortnight before transplanting.

3. DESIGN:
(i) Split-plot. (ii) 5 main-plots/repllication and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 22'×13'. (b) 16'×8'. (v) 2'9"×2'9". (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Yield of green leaf and bright leaf, total bright leaf equivalent and number of leaves per pound. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 5039 lb./ac. (ii) (a) 1549.2 lb./ac. (b) 1070.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of green leaf in lb./ac.
Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.

Object: To investigate the influence of fertilizers on the yield of flue-cured Virginia Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—Tobacco. (b) Tobacco. (c) 20 lb./ac. of N as A/S. (ii) (a) Deep black soil. (b) N.A. (iii) 12.1.1955. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33"x33", (e) 1. (f) As per treatments. (v) Harrison (medium). (vi) Unirrigated. (vii) 3 hand weedings, 1 intercultivating with planet junior hoe. (ix) 0.05'. (x) 21.1.1956 to 7.3.1956.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 54(17) on Page 543.

5. RESULTS:
   (i) 4724 lb./ac. (ii) (a) 809.2 lb./ac. (b) 623.1 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of green leaf in lb./ac.

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S.E. of difference of two
1. M marginal means = 208.9 lb./ac.
2. S marginal means = 160.9 lb./ac.
3. S means at the same level of M = 359.1 lb./ac.
4. M means at the same level of S = 383.6 lb./ac.
Crop: Tobacco (*Rahi*).

Ref: C.T.R.I. 56(5).

Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.

Object: To investigate the influence of fertilizers on the yield of flue cured Virginia Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—Tobacco. (b) Tobacco. (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) 8-11.1956.
   (iv) (a) 4 ploughings with country plough. (b) Transplanted. (c) N.A. (d) 33" x 33". (e) 1 Acre per treatment.
   (vi) Harrison special (medium). (vii) Unirrigated. (viii) 2 hand weedicings, interculturings, 1 with planet junior hoe and 1 with country plough. (ix) 1.4".
   (x) 2.1.1957 to 6.2.1957.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no 54(17) on page 543.

3. RESULTS:
   (i) 5176 lb./ac. (ii) 863 lb./ac. (iii) 601.0 lb./ac. (iv) Main effect of N alone is significant.
   
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S.E. of difference of two
- 1. M marginal means = 22.9 lb./ac.
- 2. N marginal means = 155.2 lb./ac.
- 3. N means at the same level of M = 347.0 lb./ac.
- 4. M means at the same level of N = 382.1 lb./ac.

Crop: Tobacco.

Ref: C.T.R.I. 54(18).

Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.

Object: To find out the effect of F.Y.M. charged with hyperphosphate on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—Tobacco. (b) Tobacco. (c) Nil. (ii) (a) Deep black soil. (b) N.A. (iii) 16.9.1954. (iv) (a) 6 ploughings with country plough. (b) to (e) N.A. (v) 20 lb./ac. of N as A/S by broadcast. (vi) Chatham. (vii) Unirrigated. (viii) 2 interculturings with planet junior hoe and 1 hand weeding. (ix) 2.24". (x) 9.1.1955 to 22.2.1955.

2. TREATMENTS:
   M0 = Control (no manure), M1 = 3 tons/ac. of F.Y.M., M2 = 50 lb./ac. of P2O5 as hyperphosphate charged in M1, M3 = 100 lb./ac. of P2O5 as hyperphosphate charged in M1, M4 = 50 lb./ac. of P2O5 as hyperphosphate+M1, M5 = 100 lb./ac. of P2O5 as hyperphosphate+M1, M6 = 50 lb./ac. of P2O5 as Super+M1, and M7 = 100 lb./ac. of P2O5 as Super+M1.

3. DESIGN:
   (i) R.B.D. (ii) 8. (iii) 6. (iv) (a) 22" x 44". (b) 16" x 38". (v) 2' 9" x 2' 9". (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Green leaf yield. (iv) to (vii) Nil.
5. RESULTS:

(i) 5441 lb./ac.  (ii) 764.0 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>5566</td>
<td>4999</td>
<td>5548</td>
<td>5523</td>
<td>5547</td>
<td>5323</td>
</tr>
</tbody>
</table>

S.E./mean = 311.9 lb./ac.

Crop: Tobacco (Rabi).
Ref: C.T.R.I. 57(8).
Site: Central Tobacco Res. Inst., Rajahmundry.  Type: 'M'.

Object: To compare the response of cigarette tobacco to different nitrogenous fertilizers with and without K and P.

1. BASAL CONDITIONS:

(i) (a) Tobacco—Tobacco.  (b) Tobacco.  (c) A/S at 20 lb./ac. of N.  (ii) (a) Deep black soil.  (b) N.A.  
(iii) 19.11.1957.  (iv) 1 ploughing with country plough.  (b) Transplanting.  (c) N.A.  (d) 33' x 33'.  (e) 1.  
(j) 2.65'.  (k) 5 pickings from 11.2.1958 to 17.3.1958.

2. TREATMENTS:

All combinations of (1) and (2)+control (2 plots)

(1) 5 sources of 20 lb./ac. of N: S1=A/S, S2=C/N, S3=Urea, S4=C/A/N and S5=Nitrophoska green.

(2) 2 levels of manures: M0=0 and M1=100 lb./ac. of P2O5+50 lb./ac. of K2O.

3. DESIGN:

(i) R.B.D.  (ii) 12.  (b) N.A.  (iii) 6.  (iv) 44.9' x 13.75'.  (b) 38.5' x 8.25'.  (v) 2.9' x 2.9'.  (vi) Yes.

4. GENERAL:

(i) Normal.  (ii) Incidence of aphids. Spraying was done with Basudin at 2 ozs./10 gallons of water 5 weeks after planting.  (iii) Orobanche removed and burnt.  (iii) Yield of green leaf and total bright leaf equivalent.

5. RESULTS:

(i) 6344 lb./ac.  (ii) 571.7 lb./ac.  (iii) None of the effects is significant.  (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>6614</td>
<td>6561</td>
<td>5972</td>
<td>6440</td>
<td>6018</td>
</tr>
</tbody>
</table>

Mean = 6362

S.E. of S marginal mean or control mean = 165.0 lb./ac.
S.E. of M marginal mean = 104.4 lb./ac.
S.E. of body of table = 233.4 lb./ac.
Crop :- Tobacco (Rabi).
Site :- Central Tobacco Res. Inst., Rajahmundry. 
Type :- 'M'.

Object :- To study the effect of applying fertilizers in holes around plants under deep ploughing conditions on the yield of cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco - Tobacco. (b) Tobacco. (c) 20 lb./ac. of N as A/S was applied in ploughed furrows. (ii) (a) Deep black soil. (b) N.A. (iii) 2.12.1955. (iv) (a) 4 deep ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33" x 33". (e) Nil. (f) Nil. (g) Unirrigated. (h) 3 hand weedings and 2 intercultures with planet junior hoe. (i) Nil. (ii) 9.2.1956; 20.2.1956; 5.3.1956 and 15.3.1956.

2. TREATMENTS:
   6 manurial treatments : T₀ = Control, T₁ = 20 lb./ac. of N, T₂ = 20 lb./ac. of N+100 lb./ac. of P₂O₅, T₃ = 20 lb./ac. of N+100 lb./ac. of K₂O, T₄ = 20 lb./ac. of N+20 lb./ac. of MgO, T₅ = 20 lb./ac. of N half as A/S and half as A/S/N. N applied as A/S, P₂O₅ as Super and K₂O as Pot. Sul.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 11' x 22'. (b) 5'6" x 16'6". (v) 2'9" x 2'9". (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1955 - contd. (b) Nil. (c) Nil. (d) Yes. 

5. RESULTS:
   (i) 2665 lb./ac. (ii) 1105.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1542</td>
<td>2571</td>
<td>2958</td>
<td>3487</td>
<td>2926</td>
<td>2105</td>
</tr>
</tbody>
</table>

S.E./mean = 553.4 lb./ac.

Crop :- Tobacco (Rabi).
Site :- Central Tobacco Res. Inst., Rajahmundry. 
Ref :- C.T.R.I. 57(9).
Type :- 'M'.

Object :- To study the effect of applying fertilizers in holes around plants under deep ploughing conditions on the yield of cured Virginia Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco - Tobacco. (b) Tobacco. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) 25.10.1957. (iv) (a) 4 ploughings. (b) Transplanting. (c) N.A. (d) 33" x 33". (e) Nil. (f) Nil. (g) Harrison special (medium). (h) Unirrigated. (i) Gap filling, 1 hand weeding and 3 intercultures with planet junior hoe. (j) 2.65'. (k) 6 pickings from 8.1.1958 to 24.2.1958.

2. TREATMENTS:
   Same as in exp. no. 55(6) above. Fertilizers applied in 6" deep in 4 holes around the plants on 28, 29 Oct. 1957. Before putting the fertilizers small quantities of F.Y.M. were put in the holes. Pot watering of holes followed the application of fertilizers.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 16'6" x 38'6". (b) 11' x 33'. (v) 2'9" x 2'9". (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Small attack of caterpillars controlled by spraying D.D.T at 2 oz./10 gallons water. Mild attack of aphids controlled by spraying Basudin. (iii) Yield of green leaf. (iv) (a) 1955 - contd. (b) Yes. (c) Nil. (d) Yes.
5. RESULTS:

(i) 856 lb./ac. (ii) 690.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>7346</td>
<td>8719</td>
<td>9376</td>
<td>8904</td>
<td>8852</td>
<td>8127</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>345.4 lb./ac.</td>
<td></td>
<td></td>
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</tbody>
</table>

CROP: Tobacco (*Rabi*).

SITE: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.

Object:—To study the effect of applying fertilizers in holes around plants under normal ploughing conditions on cigarette Tobacco.

1. BASAL CONDITIONS:

(i) (a) Tobacco—Tobacco. (b) Tobacco. (c) 20 lb./ac. of N as A/S was applied in ploughed furrows. (ii) (a) Deep black soil. (b) N.A. (iii) 2.12.1955. (iv) (a) 4 normal ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33°33'. (e) I. (v) Nil. (vi) Chalunnur. (vii) Unirrigated. (viii) 3 hand weedicings and 2 intercultures with planet junior hoe. (ix) Nil. (a) 9.2.1956; (b) 20.2.1956; (c) 5.3.1956 and (d) 15.3.1956.

2. TREATMENTS and 3. DESIGN:

Same as in expn. no. 55(6) on page 547.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) to (vii) Nil.

5. RESULTS:

(i) 4318 lb./ac. (ii) 886.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₃</th>
<th>T₁</th>
<th>T₂</th>
<th>T₅</th>
<th>T₄</th>
<th>T₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>4317</td>
<td>4315</td>
<td>4487</td>
<td>4299</td>
<td>3667</td>
<td>4820</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>443.2 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CROP: Tobacco (*Rabi*).
Ref: C.T.R.I. 56(6).

SITE: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.

Object:—To study the effect of applying manures in holes around plants under tractor ploughing conditions on cigarette Tobacco.

1. BASAL CONDITIONS:

(i) (a) Tobacco—Tobacco. (b) Tobacco. (c) N.A. (d) N.A. (e) 19.11.1956. (f) (a) Heavy black soil. (b) N.A. (c) 33°33'. (d) 1. (e) 100 lb./ac. of A/S applied before transplanting in ploughed furrows. (f) Harrison special (medium). (g) Unirrigated. (h) 2 intercultures with planet junior hoe and 1 hand weeding. (i) 1.44°. (j) 6 pickings from 25.1.1957 to 1.3.1957.

2. TREATMENTS:

6 manural treatments: T₀=Control, T₁=20 lb./ac. of N as A/S, T₂=20 lb./ac. of K₂O as Pot. Sul., T₃=20 lb./ac. of P₂O₅ as Super, T₄=20 lb./ac. of K₂O as Pot. Sul., T₅=20 lb./ac. of N as A/S+100 lb./ac. of P₂O₅ as Super, T₆=20 lb./ac. of K₂O as Pot. Sul., T₇=20 lb./ac. of Mg as Mg. Sul. and T₈=20 lb./ac. of N as Urea.

Manures placed in 6° deep holes around the plants.
3. **DESIGN:**
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) $16'6'' \times 38'6''$. (b) $11' \times 33'$. (v) $2'9'' \times 2'9''$. (vi) Yes.

4. **GENERAL:**
   (i) Normal. (ii) Nil. (iii) Green leaf yield. (iv) to (vii) Nil.

5. **RESULTS:**
   (i) 6634 lb./ac. (ii) 645.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>5580</td>
<td>7050</td>
<td>7002</td>
<td>6792</td>
<td>7134</td>
<td>6248</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>322.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

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**Crop:** Tobacco (*Rabi*).  
**Ref:** C.T.R.I. 56(7).  
**Site:** Central Tobacco Res. Instt., Rajahmundry.  
**Type:** M'.

Object: To study the effect of applying manures in holes around plants under normal ploughing conditions on the yield of cigarette Tobacco.

1. **BASAL CONDITIONS:**
   (i) (a) Tobacco—Tobacco. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) N.A. (iii) N.A./19.11.1956. (iv) (a) Normal ploughings. (b) Transplanting. (c) N.A. (d) $33'' \times 33''$. (e) 1 seedling/hole. (f) Nil. (g) Harrison special (medium). (h) Unirrigated. (i) 4 ft. long furrows. (ii) 6 pickings from 25.11.1956 to 11.3.1957.

2. **TREATMENTS**
   Same as in exp. no. 56(6) on page 548.

5. **RESULTS:**
   (i) 621.2 lb./ac. (ii) 5584 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>4680</td>
<td>5915</td>
<td>5840</td>
<td>6294</td>
<td>5487</td>
<td>5289</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>310.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Crop:** Tobacco (*Rabi*).  
**Ref:** C.T.R.I. 57(16).  
**Site:** Central Tobacco Res. Instt., Rajahmundry.  
**Type:** M'.

Object: To study the effect of applying manures in holes around plants under normal ploughing conditions on the yield of cigarette Tobacco.

1. **BASAL CONDITIONS:**
   (i) (a) Tobacco—Tobacco. (b) Tobacco. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) N.A./29.10.1957. (iv) (a) 3 ploughings with country plough, 2 barrowings with blade harrow. (b) Transplanting. (c) N.A. (d) $33'' \times 33''$. (e) 4 seedlings/hole. (f) Nil. (g) Harrison special (medium). (h) Unirrigated. (i) 1 yr. gap filling, 1 broad weeding and 3 intercultures with planet junior hoe. (ii) 2.65 ft. (iii) 6 pickings from 25.11.1956 to 24.2.1958.

2. **TREATMENTS**
   Same as in exp. no. 56(6) on page 548.

Fertilizers applied in 6'' deep 4 holes around the plants on 25, 26 and 28 October. A small quantity F.Y.M. was first put into the holes.
4. GENERAL:
(i) Normal. (ii) Mild attack of leaf eating caterpillars in early December controlled by spraying DDT at 2 ozs./10 gallons. Incidence of aphids controlled by spraying Basudin at 2 ozs./10 gallons. (iii) Yield of green leaf and total bright leaf equivalent. (iv) (a) 1955—contd. (b) Yes. (c) No. (v) to (vii) Nil.

5. RESULTS:
(i) 6872 lb./ac. (ii) 646.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>6129</td>
<td>6777</td>
<td>7065</td>
<td>7229</td>
<td>7207</td>
</tr>
</tbody>
</table>

S.E./mean = 332.2 lb./ac.

_Crop:_ Tobacco (Rabi).
_Ref:_ C.T.R.I. 56(8).
_Site:_ Central Tobacco Res. Inst., Rajahmundry. _Type:_ 'M'.

Object:—To compare the effect of A/Sand Urea as a source of N on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
(i) (a) Tobacco—Tobacco. (b) Tobacco. (c) Nil. (ii) (a) Heavy black soil. (b) N.A. (iii) N.A./23.11.1956. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33'x33'. (e) 1. (f) Nil. (vi) Harrison special (medium). (vii) Unirrigated. (viii) 2 intercultures and 2 hand weedings. (ix) 1.44'. (x) 7 pickings from 25.1.1957 to 16.3.1957.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 sources of N : S₁=A/S and S₂=Urea.
(2) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 24'9''x24'9''. (b) 19'3''x19'3''. (v) 2'9''x2'9''. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 6626 lb./ac. (ii) 373.0 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td></td>
<td>6404</td>
<td>7227</td>
</tr>
<tr>
<td>S₂</td>
<td></td>
<td>6744</td>
<td>6916</td>
</tr>
<tr>
<td>Mean</td>
<td>6232</td>
<td>6574</td>
<td>7072</td>
</tr>
</tbody>
</table>

S.E. of N or S marginal mean = 107.7 lb./ac.
S.E. of body of table = 132.3 lb./ac.
Crop : Tobacco (Rabi).

Site : Central Tobacco Res. Inst., Rajahmundry.

Type : 'M'.

Object :-To compare the effect of A/S and Urea as a source of Z on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS :
   (i) (a) Tobacco Tobacco. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) N.A. (iii) N.A./20.10.1977. (iv) (a) 1 ploughing with country plough. (b) Transplanting. (c) N.A. (d) 33" x 33". (e) 1. (v) N.A. (vi) Harrison special (medium). (vii) Unirrigated. (viii) Gap-filling, removal of sand leaves, 2 hand weedings, interculturing with planet junior hoe 2 times. (ix) N.A. (x) 6 pickings from 30.12.1957 to 13.2.1958.

2. TREATMENTS :
   Same as in exp. no. 56(8) on page 550.

3. DESIGN :
   (i) Fact, in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 44' x 13.75'. (b) 38.5' x 8.5'. (v) 2'9" x 2'9". (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Caterpillar attack was controlled by spraying of DDT at 2 oz./10 gallons of water. Aphids attack was controlled by spraying 2 oz./10 gallons of Basudin. In case of mosaic disease care was taken not to touch attacked plants. (iii) Green leaf yield and total bright leaf equivalent. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
   (i) 7467 lb./ac. (ii) 565.0 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>7546</td>
<td>7897</td>
<td>7722</td>
</tr>
<tr>
<td>S2</td>
<td>7244</td>
<td>8020</td>
<td>7612</td>
</tr>
<tr>
<td>Mean</td>
<td>6625</td>
<td>7395</td>
<td>7558</td>
</tr>
</tbody>
</table>

S.E. of N or S marginal mean = 163.1 lb./ac.
S.E. of body of table = 230.7 lb./ac.

Crop : Tobacco (Rabi).

Site : Central Tobacco Res. Inst., Rajahmundry.

Type : 'M'.

Object :-To study the effect of tobacco uncomposted and composted stalks on improvement of physical conditions of soil and it's effect on response to N, P and K of cigarette Tobacco.

1. BASAL CONDITIONS :
   (i) (a) Tobacco—Tobacco. (b) Tobacco. (c) N.A. (ii) (a) 20 lb./ac. of N as A/S. (b) N.A. (iii) N.A./25.10.1957. (iv) (a) 2 ploughings. (b) Transplanted. (c) N.A. (d) 33" x 33". (e) 1. (v) As per treatments. (vi) Harrison special (medium). (vii) Unirrigated. (viii) Gap-filling, removal of sand leaves, 2 hand weedings. Inter culturing was done with planet junior hoe both ways before paddy straw mulching at 3200 lb./ac. and crow barring in summer. (ix) 1.5'. (x) 31.12.1957 to 20.2.1958.

2. TREATMENTS :
   5 manurial treatments : T0 = Control (3 tons/ac. of F.Y.M. given to 2 plots), T1 = 20 lb./ac. of N as A/S, of P2O5=50 lb./ac. of K2O, T1=T1+3 tons/ac. of F.Y.M., T3=Uncomposted tobacco stalks chaffed with T1 and T4=Tobacco stalks chaffed and composted with T1 (2 plots).

Tobacco stalks were applied at 5 tons/ac.
3. DESIGN:
(i) R.B.D. (ii) 7. (b) N.A. (iii) 5. (iv) (a) 46'9"x24'9". (b) 41'3"x19'3". (v) 2'9"x2'9". (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Slight incidence of mosaic and incidence of caterpillar attack. Spraying was done once with DDT at 2 oz. in 10 gallons of water. (iii) Green leaf yield and total bright leaf equivalent. (iv) to (vi) N.A. (vii) To compare the effect of crowbarring with normal cultivation a control plot was laid out adjoining to the main exist. The control plot received 3 ploughings and 2 harrowings. The plot was divided into 2 equal parts (2'9"x46'7") and N, P and K treatments were applied deep during 3rd week of October. Results presented under non crowbarred area.

5. RESULTS:
(i) 819 lb./ac. (ii) 705.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
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</table>

S.E. of mean (other than T₀ and T₄) = 313.3 lb./ac.
S.E. of T₀ or T₄ mean = 223.0 lb./ac.

Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.
Object: To study the effect of continuous application of N, P and K with and without F.Y.M on the yield of cigarette Tobacco.

1. BASAL CONDITIONS:
(i) (a) Continuous tobacco. (b) Tobacco. (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) N.A./2.11.1955. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (v) 33'x33'. (d) I. (e) Nil. (vi) Harrison special (medium). (vii) Unirrigated. (viii) 3 hand weedicings, 2 intercultures with country plough and 1 with planet junior hoe. (ix) 0.12". (x) 6 primings from 7.1.1956 to 20.2.1956.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 2 levels of N as A/S: N₀=0 and N₁=20 lb./ac.
(2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=100 lb./ac.
(3) 3 levels of K₂O as Pot. Sul.: K₀=0 and K₁=50 lb./ac.
F.Y.M. could not be given as the treatments were applied rather late.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 8. (iv) (a) 13'9"x49'6". (b) 8'3"x44'9". (v) 2'9"x2'9". (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1955—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rain. (vii) The seedlings were transplanted on 12.10.1955 but due to heavy rains they have to be replanted on 2.11.1955.

5. RESULTS:
(i) 4487 lb./ac. (ii) 588.1 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of green leaf in lb./ac.
Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.

Object: To study the effect of N, P and K with and without F.Y.M. on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
   (iv) 4 ploughings with country plough. (v) Harrison special (medium). (vi) Uirrigated. (vii) 2 intercultures and 2 hand weedings. (viii) No prunings from 7.1.1957 to 1.3.1957.

2. TREATMENTS:
   Main-plot treatments:
   - 2 levels of F.Y.M.: F0 = 0 and F1 = 3 tons/acre.
   - All combinations of (1), (2) and (3).
     (1) 2 levels of N as A/S: N0 = 0 and N1 = 20 lb./acre.
     (2) 2 levels of P0 as Super: P0 = 0 and P1 = 100 lb./acre.
     (3) 2 levels of K0 as Pot. Sul.: K0 = 0 and K1 = 50 lb./acre.

3. DESIGN:
   (i) 2 x 2 x 3 split-plot confd. (ii) (a) 2 main-plots/replications, 2 blocks/main-plot and 4 sub-plots/block.
   (b) N.A. (iii) 4. (iv) (a) 13' x 39'6". (b) 8' x 39'6". (v) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1955—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 538 lb./acre. (ii) 597 lb./acre. (b) 423 lb./acre. (iii) Main effects of N, P and K are highly significant.
   (iv) Av. yield of green leaf in lb/acre.
Crop :- Tobacco (Rabi).

Site :- Central Tobacco Res. Instt., Rajahmundry. Type :- 'M'.

Object :- To study the effect of N, P and K with and without F.Y.M. on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS :
   (i) (a) Continuous tobacco. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) N.A.
   (iii) N.A./29.10.1957. (iv) (a) 2 ploughings with iron mould board plough. (b) Planting with rope. (c) N.A.
   (d) 33' x 33'. (e) 1. (f) Nil. (vi) Harrison special (medium). (vii) Unirrigated. (viii) Gap-filling, removal of sand leaves, 2 hand weedicings and 3 interculturings with planet junior hoe. (ix) 2.56'. (x) 6 primings from 8.1.1958 to 25.2.1958.

2. TREATMENTS and 3. DESIGN :
   Same as in exptr. no. 56(9) on page 553.

4. GENERAL :
   (i) Normal. (ii) Caterpillar attack. One spraying with DDT at 2 ccm. in 10 gallons of water. (iii) Green leaf yield and total bright leaf equivalent. (iv) (a) 1955 - contd. (b) Yes. (c) No. (v) to (vii) Nil.

5. RESULTS :
   (i) 6136 lb./ac. (ii) (a) 888.7 lb./ac. (b) 639.5 lb./ac. (iii) Only main effect of N is highly significant. (iv) Av. yield of green leaf in lb./ac.

<table>
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<th>( F_0 )</th>
<th>( F_1 )</th>
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S.E. of difference of two

1. F marginal mean = 149.3 lb./ac.
2. N, P or K marginal means = 105.8 lb./ac.
3. N, P or K means at the same level of F = 152.7 lb./ac.
4. F means at the same level of N, P or K = 182.9 lb./ac.
S.E. of body of \( N \times P \), \( N \times K \) or \( P \times K \) table = 105.8 lb./ac.
Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.

Object: To study the effect of N, P and K with and without F.Y.M. on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco after tobacco. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) N.A. (iii) N.A./6.11.19. (iv) (a) 3 ploughings with country plough before application of F.Y.M. and 1 ploughing with iron mould board plough after applying F.Y.M. (b) Transplanting. (c) N.A. (d) 33' x 33'. (e) 1. (f) Nil. (g) Harrison special (medium). (h) Unirrigated. (i) Gap-filling, removal of sand leaves, 4 hand weeding, 4 intercultures with planet junior hoe and 1 with country plough. (j) Nil. (k) 6 primings from 6.1.1959 to 22.2.1960.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 56(9) on page 53.

4. (i) Satisfactory. (ii) Caterpillar attack. 2 sprayings with DDT at 2 ozs. in 10 gallons of water. Attack of aphids. One spraying with Basudin at 2 ozs. in 10 gallons of water. Orobanche — removed and destroyed. (iii) Yield data. (iv) (a) 1955 — contd. (b) Yes. (c) Nil. (d) (a) and (b). (e) Nil. (f) Heavy rains. (g) Nil.

5. RESULTS:
   (i) 5528 lb./ac. (ii) (a) 1011.5 lb./ac. (b) 545.9 lb./ac. (iii) Main effects of F and N are highly significant. (iv) Av. yield of green leaf in lb./ac.

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S.E. of difference of two
1. F marginal means = 252.9 lb./ac.
2. N, P or K marginal means = 136.5 lb./ac.
3. N, P or K means at the same level of F = 193.1 lb./ac.
4. F means at the same level of N, P or K = 287.4 lb./ac.
S.E. of body of N×P, N×K or P×K table = 136.5 lb./ac.

Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Inst., Rajahmundry. Type: 'M'.

Object: To study the effect of N, P or K with and without F.Y.M. on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco after tobacco. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) N.A. (iii) N.A./6.11.195. (iv) (a) 1 ploughing with country plough before application of F.Y.M. and one harrowing to mix up F.Y.M. 2 ploughings before application of fertilizers. (b) Transplanting. (c) N.A. (d) 33' x 33'. (e) 1. (f) Nil. (g) Harrison special (medium). (h) Unirrigated. (i) Gap-filling, removal of sand leaves. 4 hand weeding, 4 intercultures with planet junior hoe and 1 with country plough. (j) Nil. (k) 6 primings from 8.1.1940 to 22.2.1960.
2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 55(9) on page 553.

4. GENERAL:
(i) Very poor. (ii) Caterpillar attack. Endrin was sprayed thrice at 2 ozs. in 10 gallons of water. Aphids attack. Basudm was sprayed once at 2 ozs. in 10 gallons of water. Caterpillars were also removed by hand three times. (iii) Yield of green leaf. (iv) (a) 1953—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2668 lb./ac. (ii) (a) 457.7 lb./ac. (b) 338.8 lb./ac. (iii) Main effect of N is highly significant. (iv) Av. yield of green leaf is lb./ac.

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S.E. of difference of two
1. F marginal means = 114.4 lb./ac.
2. N, P or K marginal means = 84.7 lb./ac.
3. N, P or K means at the same level of F = 119.8 lb./ac.
4. F means at the same level of N, P or K = 142.4 lb./ac.
S.E. of body of N XP, N X K or P X K table = 84.7 lb./ac.

Crop :- Tobacco (Rabi).
Ref :- C.T.R.I. 58(8).
Site :- Central Tobacco Res. Instt., Rajahmundry. Type :- 'M'.

Object :- To study the response of cigarette Tobacco to different nitrogen fertilizers at different levels of N with and without P and K under normal ploughing.

1. BASAL CONDITIONS:
(i) (a) Tobacco after tobacco. (b) Tobacco. (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) N.A./13.11.1958. (iv) (a) 3 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33°×33°. (e) 1. (f) 3 tons/ac. of M.C. (vii) Harrison special (medium). (viii) Unirrigated. (ix) Gap-filling was done twice. 2 inter-culturings was done with planet junior hoe. Mulching with paddy straw. (x) 11/6°. (xi) 5 primings from 27.1.1959 to 11.3.1959.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 5 sources of N : S1=A/S, S2=Ca, S3=Urea, S4=C/A/N and S5=Nitrophoska green.
(2) 2 levels of N : N1 = 20 and N2 = 40 lb./ac.

Sub-plot treatments: 2 levels of P0 + K2O : M0 = 0 and M1 = 100 lb./ac. of P2O5 as Super and 50 lb./ac. of K2O as Pot. Sul.

3. DESIGN:
(i) Split-plot. (ii) (a) 10 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 22.0'×19.25'. (b) 10'×13'. (v) 2'9"×2'9". (vi) Yes.
4. GENERAL:
(i) Considerable number of plants were lodged in February due to heavy rain in early stages of crop growth. (ii) Severe incidence of caterpillar. Hand picking of caterpillars and spraying of DDT at 20 ozs. in 10 gallons of water. Incidence of aphids—spraying of Basudin at 2 ozs. in 10 gallons of water. (iii) Yield of green leaf. (iv) (a) 1937—coated (modified in 1938). (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains. (vii) Nil.

5. RESULTS:
(i) 7004 lb./ac. (ii) (a) 954.3 lb./ac. (b) 633.6 lb./ac. (iii) Main effect of Malone is significant. (iv) Av. yield of green leaf in lb./ac.

<table>
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<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
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Mean 7173 6704 6892 7006 7244 7004 6904 7203

N1 6767 6678 6735 6583 7054 7244

N2 7365 6731 7048 7203

S.E. of difference of two
1. S marginal means = 341.7 lb./ac. 5. S means at the same level of M = 402.9 lb./ac.
2. N marginal means = 216.1 lb./ac. 6. M means at the same level of N = 190.9 lb./ac.
3. M marginal means = 135.0 lb./ac. 7. N means at the same level of M = 254.8 lb./ac.
4. M means at the same level of S = 301.8 lb./ac. S.E. of body of S×N table = 216.1 lb./ac.

Crop: Tobacco (Rabi).
Ref: C.T.R.I. 58(9).
Site: Central Tobacco Res. Instit., Rajahmundry. Type: 'M'.
Object: To study the response of cigarette Tobacco to different nitrogenous fertilizers at different levels of N with and without P and K under tractor ploughing.

1. BASAL CONDITIONS:
(i) (a) Tobacco after Tobacco. (b) Tobacco. (c) N.A. (i) (a) Deep black soil. (b) N.A. (ii) 13.11.1958. (iv) (a) 1 ploughing with tractor and 2 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33''×33'' (e) 1. (v) 3 tons/ac. of M.C. (vi) Harrison special (medium). (vii) Unirrigated. (viii) Gap filling done thrice. Interculture with planet junior hoe two weeks after planting. Mulching with paddy straw one week after interculturing. (ix) 11.6'' (x) 6 primings from 16.1.1959 to 11.3.1959

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 58(8) on page 556.

5. RESULTS:
(i) 8123 lb./ac. (ii) (a) 841.7 lb./ac. (b) 623.9 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of green leaf in lb./ac.

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Mean 8292 8090 8124 8008 7902 8123 7917 8329

N1 7800 7948 8356 7985 7498

N2 8783 8232 8292 8031 8307
Object:—To compare the effect of organic manures and inorganic fertilizers on the yield and quality of flue cured virginia Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco after tobacco. (b) Tobacco. (c) 20 lb./ac. of N as A/S. (ii) (a) Deep black soil. (b) N.A. (iii) 31.10.1959. (iv) (a) 4 ploughings with country plough and green gram and control treatment plots got one more ploughing. (b) Transplanting. (c) N.A. (d) 33' x 33'. (e) I. (f) Nil. (vi) Harrison special (medium). (vii) Unirrigated. (viii) Gap-filling was done twice. 3 hand weedings and 3 intercultures with planet junior hoe. (ix) Nil. (x) 1.6'.
   (v) Nil. (vi) Harrison special (medium). (vii) Unirrigated. (viii) Gap-filling was done twice. 3 hand weedings and 3 intercultures with planet junior hoe. 1.6'. (ix) Nil. (x) 1.6'.

2. TREATMENTS:
   9 sources of 20 lb./ac. of N : N0 = Control (no manure), N1 = F.Y.M., N2 = G.N.C., N3 = Castor cake, N4 = Sannhemp as G.M., N5 = Green gram as G.M., N6 = A/S, N7 = C/A/N and N8 = Urea.

3. DESIGN:
   (i) Balanced lattice. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 27.5' x 22.0'. (b) 22.0' x 16.5'. (v) One row on all sides. (vi) Yes.

4. GENERAL:
   (i) Due to heavy rains considerable number of plants were lodged in February. (ii) Severe incidence of caterpillar. Spraying was done with DDT at 2 ozs. in 10 gallons of water. Hand picking and destruction by putting in kerosene water was also done. For caterpillar attack G.M. crops of sannhemp, Endrine was sprayed at 1 oz. in 10 gallons of water. On green gram DDT was sprayed at 4 ozs. in 10 gallons of water and incidence of Orobanche was also noticed. Orobanche were pulled and burnt. (iii) Yield of green leaf. (iv) (a) 1958—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains during the early stages of the crop growth.

5. RESULTS:
   (i) 6032 lb./ac. (ii) 926.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

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2. TREATMENTS and DESIGN:
Same as in expt. no. 58(10) on page 558.

4. GENERAL:
(i) Normal. (ii) Caterpillar attack. Spraying of Endrin at 2 ozs. in 10 gallons of water. Aphids attack. Basudin sprayed at 2 ozs. in 10 gallons of water. Orobanche—Removed by hand. (iii) Yield of green leaf. (iv) 1958—contd. (v) Yes. (vi) Nil. (vii) Heavy rains. (viii) Green manure crops could not be incorporated in time due to heavy rains in September. The tobacco crop in the 2 green manure treatments was, therefore, raised without any application of manure or fertilizer. The data is analysed as R.B.D. because the efficiency of the balanced lattice over R.B.D. is found to be much less.

5. RESULTS:
(i) 2779 lb./ac. (ii) 365.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>N_3</th>
<th>N_4</th>
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<th>N_6</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>2030</td>
<td>2798</td>
<td>3417</td>
<td>3318</td>
<td>2564</td>
<td>2522</td>
<td>2612</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>2815</td>
<td>2939</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Tobacco (Rabi).

Site: Central Tobacco Res. Instit., Rajahmundry.

Type: 'M'.

Object:—To study the response of cigarette Tobacco to different nitrogenous fertilizers under deep ploughing conditions.

1. BASAL CONDITIONS:
(i) (a) Tobacco after tobacco. (b) Tobacco. (c) 20 lb./ac. of N as A/S. (i) Deep black soil (b) N.A. (vi) 12.11.1959. (v) 1 tractor ploughing, 2 ploughings with country plough and hoeing to mix up FYM. (b) Transplanting. (c) N.A. (d) 33'x22'. (e) 1. (v) F.Y.M. at 3 tons/ac. (v) Harrison special (medium). (vii) Unirrigated. (viii) 2 gap-fellings, 2 hand weedings, 4 interculturings with planet junior hoe and 1 interculturing with country plough. (x) 0.66'. (x) 7 prominings from 13.1.1960 to 14.3.1960.

2. TREATMENTS:
5 sources of 20 lb./ac. of N: S_1=A/S, S_2=Urea, S_3=C/A/N, S_4=Nitrophoska blue and S_5=Complex fertilizer.

3. DESIGN:
(i) L.Sq. (ii) 5. (b) N.A. (iii) 5 (effective number=3). (iv) (a) 33.0'x19.25'. (b) 27.5'x13.75'. (v) 1 row on all sides. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Caterpillar attack—Twice hand picking, spraying Endrin at 2 ozs. in 10 gallons of water. Aphids attack—Spraying Basudin at 2 ozs. in 10 gallons of water. Orobanche—Removed by hand. (iii) Yield of green leaf. (v) (a) 1959—N.A. (b) No. (c) Nil. (v) and (vi) Nil. (vii) 2 replications suffered due to nematode infestation, hence they were dropped from analysis. The experiment is analysed as R.B.D.

5. RESULTS:
(i) 4936 lb./ac. (ii) 502.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
<th>S_5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>4786</td>
<td>4193</td>
<td>4714</td>
<td>4620</td>
<td>4178</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>289.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Inst., Rajahmundry. Type: 'M'.

Object: To study the effect of continuous application of P on flue cured cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) Tobacco after tobacco. (b) Tobacco. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) 8.11.1959. (iv) (a) 2 ploughings. (b) Transplanting. (c) N.A. (d) 33'×33'. (e) L. (f) F.Y.M. at 3 tons/ac. Super at 600 lb/ac. and A/S at 100 lb/ac. (v) Harrison special (medium). (vi) Unirrigated. (vii) 2 gap-plantings, hand weeding as and when required, 4 intercultures with planet junior hoe and 1 interculture with country plough. (ix) Nil. (a) 6 primings from 12.1.1560 to 22.2.1960.

2. TREATMENTS:
   8 manural treatments: T1=No manure, T2=Manuring every year, T3=Manuring in 1st and 2nd years and no manure in 3rd year, T4=Manuring in 2nd and 3rd year, T5=Manuring in 1st and 3rd year, T6=Manuring in 1st year only, T7=Manuring in 2nd year only and T8=Manuring in 3rd year only.
   Manuring done with 100 lb/ac of P2O5 as Super starting with 1958-1959.

3. DESIGN:
   (i) R.B.D. (ii) 8. (b) N.A. (iii) 4, (iv) (a) 22.0' × 19.25'. (b) 16.5' × 13.75'. (v) 1 guard row on all sides of the plot. (vi) Yes.

4. GENERAL:

5. RESULTS:
   (i) 10362 lb/ac. (ii) 88.5 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb/ac.
   Treatment
   \[ \begin{array}{|c|c|c|c|}
   \hline
   & T1+T4 & T2+T5 & T3+T8 \\
   \hline
   T4+T7 & 10530 & 10708 & 10627 \\
   \hline
   T5+T8 & 10475 & & \\
   \hline
   \end{array} \]
   S.E./mean = 312.7 lb/ac.

Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Inst., Rajahmundry. Type: 'M'.

Object: To find out whether Urea can be used in place of A/S as the former has given indications of increasing top grades for cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) 20 lb/ac. of N as A/S was broadcast. (ii) (a) Deep black soil. (b) N.A. (iii) 11.12.1955. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33'×33'. (e) L. (f) Nil. (g) Harrison special (medium). (vi) Unirrigated. (vii) 2 hand plantings, 3 intercultures with planet junior hoe and 1 with country plough. (ix) 6.05'. (a) 6 primings from 25.1.1556 to 7.3.1955.

2. TREATMENTS:
   Main-plot treatments:
   2 sources of N: S1=A/S and S2=Urea.
   Sub-plot treatments:
   5 levels of N: N1=10, N2=20, N3=30, N4=40 and N5=50 lb/ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 16'×99'. (b) 11'×93'. (v) 1 row all round each plot. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) to (vii) Nil.

5. RESULTS:
(i) 2661 lb./ac. (ii) (a) 455.7 lb./ac. (b) 429.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
<th>N5</th>
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<tr>
<td>S1</td>
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<td>2033</td>
<td>2936</td>
<td>2221</td>
<td>2926</td>
<td>2649</td>
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<tr>
<td>S2</td>
<td>2500</td>
<td>2629</td>
<td>3105</td>
<td>3036</td>
<td>2118</td>
<td>2678</td>
</tr>
<tr>
<td>Mean</td>
<td>2755</td>
<td>2341</td>
<td>3021</td>
<td>2779</td>
<td>2722</td>
<td>2664</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. S marginal means = 144.1 lb./ac.
2. N marginal means = 215.0 lb./ac.
3. N means at the same level of S = 304.0 lb./ac.
4. S means at the same level of N = 307.7 lb./ac.

Crop: Tobacco (Rabi).

Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.

Object: To study whether any response to phosphate can be obtained by different methods of placement on cigarrette Tobacco.

1. BASAL CONDITIONS:
(i) (a) Continuous tobacco. (b) Tobacco. (c) 20 lb./ac. of N as A/S. (ii) (a) Deep black soil. (b) N.A. (iii) 15.11.1915. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33°x33°. (e) I. (f) Nil. (g) Harrison special medium. (h) Nearigated. (ix) 2 hand seedings and 2 inter-culturings with country plough. (x) 0.05°. (y) 5 primings from 1.2.1956 to 3.3.1956.

2. TREATMENTS:
6 manurial treatments: M0 = Control, M1 = Water treatment, M2 = M1+100 lb./ac. of P2O5 as Super, M3 = M1+20 lb./ac. of N as A/S, M4 = M2+20 lb./ac. of N as A/S, and M5 = M1+100 lb./ac. of P2O5 as spray.

3. DESIGN:
(i) R.B.D. (ii) 6. (b) N A. (iii) 4. (iv) (a) 13'x14'. (b) 8'x19'. (v) 23'x27'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 5912 lb./ac. (ii) 549.4 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>5825</td>
<td>5748</td>
<td>5958</td>
<td>5866</td>
<td>6440</td>
<td>5634</td>
</tr>
</tbody>
</table>

S.E./mean = 474.7 lb./ac.

Crop: Tobacco (Rabi).

Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'M'.

Object: To find out the effect of G.M. with maize on yield and quality of cigaret Tobacco.
1. **BASAL CONDITIONS:**

(i) (a) Tobacco—G.M. (b) Tobacco. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) 9.11.1955. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (c) 33" x 33". (e) 1. (v) Nil. (vi) Harrison special (medium). (vii) Unirrigated. (viii) 2 hand-weedicings, 2 intercultures with planet junior hoe and 1 with country plough. (ix) 0.03°. (x) 6 prirnings from 19.1.1956 to 25.2.1956.

2. **TREATMENTS:**

Main-plot treatments:

- 3 levels of G.M.: M₀ = No maize, M₁ = Maize grown and buried and M₂ = Maize grown and cut.

Sub-plot treatments:

- 3 levels of N as A/S: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.

3. **DESIGN:**

(i) Split-plot. (ii) (a) 3 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 16' x 71'. (b) 11' x 61'. (v) One row around the plot. (vi) Yes.

4. **GENERAL:**

(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) to (vii) Nil.

5. **RESULTS:**

(i) 3981 lb/ac. (ii) (a) 1378.4 lb/ac. (b) 447.1 lb/ac. (iii) Main effect of M alone is significant. (v) Ax. yield of green leaf in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>M₀</td>
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<td>5385</td>
<td>5689</td>
<td>5415</td>
</tr>
<tr>
<td>M₁</td>
<td>3334</td>
<td>3303</td>
<td>3980</td>
<td>3559</td>
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<tr>
<td>M₂</td>
<td>2876</td>
<td>3014</td>
<td>3019</td>
<td>2970</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. M marginal means = 503.3 lb./ac.
2. N marginal means = 163.3 lb./ac.
3. N means at the same level of M = 282.8 lb./ac.
4. M means at the same level of N = 353.7 lb./ac.

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**Crop:** Tobacco. **Ref:** C.T.R.L 54(19).

**Site:** Cigar and Cheroot Tobacco Res. Sta., Vedasandur. **Type:** 'M'.

Object: To compare the response of cigar Tobacco to different forms of inorganic nitrogenous fertilizers applied with and without F.Y.M.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (b) Cumbu. (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) 2.11.1954. (iv) (a) 4 ploughings. (b) Transplanting. (c) N.A. (d) 2.5’ x 2’. (e) 1. (v) Nil. (vi) Yelliwazhai (Nicotiana tabacum). (vii) Irrigated. (viii) H eing earthing up, weeding and topping. (ix) 6.30°. (x) 8.2.1955.

2. **TREATMENTS:**

All combinations (1 and 2)

- (1) 4 sources of 100 lb/ac. of N: S₀ = Control (no application), S₁ = A/S, S₂ = C/N and S₃ = A/S/N.
- (2) 2 levels of F.Y.M.: F₀ = 0 and F₁ = 20 C.L./ac.

F.Y.M. applied as broadcast one month before planting. N applied in 2 equal doses as broadcast at planting and as top dressing 6 weeks after planting.

3. **DESIGN:**

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 22.5’ x 15.5’. (b) 17.5’ x 10.0’. (v) 2.5’ x 2.25’. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) In the initial stages of plant growth, regular spraying with DDT 550 was done as a precautionary measure against leaf eating caterpillar (Prodenia litura) and stem borer. In the later stages the crop was sprayed periodically with tobacco decoction as the crop was found infested with aphids. (iii) Yield of tobacco. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v to vii) Nil.

5. RESULTS:
(i) 2165 lb./ac. (ii) 254.0 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
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<tr>
<td>$F_0$</td>
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<td>2317</td>
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<td>$F_1$</td>
<td>1959</td>
<td>2284</td>
<td>2218</td>
<td>2150</td>
<td>2178</td>
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<tr>
<td>Mean</td>
<td>1978</td>
<td>2351</td>
<td>2244</td>
<td>2087</td>
<td>2165</td>
</tr>
</tbody>
</table>

S.E. of $S$ marginal mean = 73.3 lb./ac.
S.E. of $F$ marginal mean = 51.8 lb./ac.
S.E. of body of table = 77.4 lb./ac.

Site : Cigar and Cheroot Tobacco Res. Stn., Vedasandur. Type : 'M'.

Object — To compare the response of cigar Tobacco to different forms of inorganic fertilizers applied with and without F.Y.M.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) N.A. (iv) (a) 4 pouhings. (b) Transplanting. (c) 8,712 plants/ac. (d) 2.5'X2'. (e) 1. (v) Nil. (vi) Vellaiavzhal. (vii) Irrigated. (viii) Weeding and hoeing, mummati digging, earthing-up and topping. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 54(19) on page 562.

4. GENERAL:
(i) Sub-normal. (ii) Severe incidence of aphids and the same persisted till the end inspite of repeated sprayings with tobacco decoction and endrin. (iii) Yield of cured tobacco. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Commencement of monsoon was late. (vii) Nil.

5. RESULTS:
(i) 1859 lb./ac. (ii) 189.6 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
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<tbody>
<tr>
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<td>1919</td>
<td>2024</td>
<td>1956</td>
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<tr>
<td>$F_1$</td>
<td>1585</td>
<td>1874</td>
<td>1961</td>
<td>1944</td>
<td>1841</td>
</tr>
<tr>
<td>Mean</td>
<td>1596</td>
<td>1897</td>
<td>1992</td>
<td>1950</td>
<td>1859</td>
</tr>
</tbody>
</table>

S.E. of $S$ marginal mean = 54.7 lb./ac.
S.E. of $F$ marginal mean = 38.7 lb./ac.
S.E. of body of table = 77.4 lb./ac.

Site: Cigar and Cheroot Tobacco Res. Stn., Vedasandur. Type: MLP.

Object: To study the fertilizer value of indigenous rock phosphates as compared to Super and B.M. on Cigar Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Legume—Tobacco. (b) Sunnhemp. (c) Nil. (a) Red loam. (b) Nil. (iii) 16.10.1954 to 28.10.1954.
   (iv) (a) 4 ploughings. (b) Transplanting. (c) Nil. (d) 2.5′ x 2′. (e) 1. (v) 20 C.L./ac. of F.Y.M. (vi) Fellarvachai (Nicotiana tabacum). (vii) Irrigated. (viii) Weeding, hoeing, earthing up and topping. (x) 13.03.1955 and 9.2.1955.

2. TREATMENTS:
   8 manurial treatments: M₀ = Control, M₁ = 100 lb./ac. of N as A/S, M₂ = M₁ + 200 lb./ac. of P₂O₅ as rock phosphate (Trichy nodules), M₃ = M₁ + 100 lb./ac. of P₂O₅ as Super, M₄ = M₁ + 66 lb./ac. of P₂O₅ as rock phosphate (Trichy nodules), M₅ = M₁ + 66 lb./ac. of P₂O₅ as Super and 66 lb./ac. of P₂O₅ as rock phosphate (Singhbhum) and M₆ = M₁ + 200 lb./ac. of P₂O₅ as B.M. A/S applied in two equal doses, as broadcast at planting and top dressing 6 weeks after transplanting. P₂O₅ applied in bands just before transplanting.

3. DESIGN:
   (i) RBD. (ii) 8. (b) N.A. (iii) 20. (iv) (a) 30′ x 15′. (b) 25′ x 15′. (v) 2.5′ x 2.5′. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Regular spraying with DOT was done as a precautionary measure against leaf eating caterpillar and stem borer. (iii) Yield of tobacco. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2439 lb./ac. (ii) 176.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
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<td>2289</td>
<td>2427</td>
<td>2459</td>
<td>2435</td>
<td>2490</td>
<td>2499</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>71.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>


Site: Cigar and Cheroot Tobacco Res. Stn., Vedasandur. Type: MLP.

Object: To study the fertilizer value of indigenous rock phosphates as compared to Super and B.M. on Cigar Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (i) (a) Red loam. (b) N.A. (iii) N.A. (iv) (a) 4 ploughings. (b) Transplanting. (c) 8,712 plants/acre. (d) 30′ x 24′. (e) 1. (v) 20 C.L./ac. of F.Y.M. (vi) Fellarvachai. (vii) Irrigated. (viii) Weeding, hoeing, monnmati digging, earthing up and topping. (x) and (x) N.A.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(20) above.

4. GENERAL:
   (i) Sub-normal. (ii) Nil. (iii) Yield of cured tobacco. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (v) Commencement of monsoon was late. (vi) Nil.

5. RESULTS
   2431 lb./ac. (ii) 192.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.
Crop :- Tobacco.  

Site :- Cigar and Cheroot Tobacco Res. Sta., Vedasandur.  Type :- 'M'.

Object :-To study the effect of different levels of N and different methods of application on the yield and quality of cigar Tobacco.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Cumbu. (c) Nil.  
   (ii) (a) Red loam. (b) N.A. (iii) 18.10.1954. (iv) (a) 3 ploughings.  
   (b) Transplanting. (c) N.A. (d) 24' x 2'. (e) I. (vi) 20 C. L.ac. of F.Y.M. (vii) multiangular (Nicotiana tabacum). (viii) Irrigated. (ix) Weeding, hoeing, topping and suckering. (x) 13.03'. (xi) 24.1.1953.

2. TREATMENTS:
   Main-plot treatments:
   4 levels of N as A/S : N1~60, N2~90, N3~120 and N4~150 lb./ac.
   Sub-plot treatments:
   4 methods of application of N : M1=Broadcast before transplanting, M2=Half dose as in M1+half top dressed 6 weeks after transplanting, M3=Band placement before transplanting and M4=Half dose as in M2+top dressed 6 weeks after transplanting.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 16' x 20', (b) 10' x 15'. (v) 3' x 2.5'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Regular spraying with DDT 500 was done as a safeguard against leaf eating caterpillar and stem borer. (iii) Yield of tobacco. (iv) (a) 1951-1954. (b) N/A. (c) N/A. (v) to (vii) N/A.

5. RESULTS:
   (i) 1943 lb./ac. (ii) (a) 412.0 lb./ac. (b) 1890 lb./ac. (iii) Main effect of N is significant and that of M is highly significant. (iv) Av. yield of curd leaf in lb./ac.

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S.E. of difference of two
1. N marginal means = 118.9 lb./ac.
2. M marginal means = 54.6 lb./ac.
3. M means at the same level of N = 109.1 lb./ac.
4. N means at the same level of M = 151.9 lb./ac.

---

Crop :- Tobacco.  

Site :- Cigar and Cheroot Tobacco Res. Sta., Vedasandur.  Type :- 'M'.

Object :-To study the effect of different sources of K with other fertilizers on cigar Tobacco.
1. BASAL CONDITIONS:
   (i) Tobacco—Cumbu. (b) Cumbu. (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) 13.10.1954. (iv) (a) 4 ploughings. (b) Transplanting. (c) N.A. (d) 2.5'x2'. (e) 1. (f) Nil. (i) Vellavazhal (local). (ii) Irrigated. (viii) Weeding, hoeing, earthing up and topping. (ix) 13.03'. (x) 21.11.1955.

2. TREATMENTS:
   Main-plot treatments:
   5 manurial treatments: M_0=Control, M_1=20 C.L./ac. of FYM., M_2=100 lb./ac. of N as A/S, M_3=100 lb./ac. of P_2O_5 as Super and M_4=M_2+M_3.

   Sub-plot treatments:
   5 sources of 100 lb./ac. of K_2O: K_0=0 (no application), K_1=Pot. sul., K_2=Pot. chloride, K_3=Pot. nitrate and K_4=Pot. carbonate.

   FYM was applied one month before transplanting. Half dose of N with full dose of K_30 and P_2O_5 applied just before planting in furrows. Remaining half dose of N applied at mummati digging.

3. DESIGN:
   (i) Split-plot. (ii) (a) 5 main-plots/replication and 5 sub-plots/main-plot. (b) N.A. (ii) 6. (v) (a) 19'x10'. (b) 15'x6'. (v) 2'x2'. (vii) Yes.

4. GENERAL:
   (i) Normal. (ii) During the earlier periods of growth there was an attack of stem-borer which was brought under control by removing the borer from the affected plants. (iii) Yield of tobacco. (iv) (a) 1954—1956. (b) Yes. (c) Nil. (v) (vii) Nil.

5. RESULTS:
   (i) 2435 lb./ac. (ii) (a) 416.0 lb./ac. (b) 242.0 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of cured leaf in lb./ac.

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</table>

   Mean: 2415

   S.E. of difference of two
   1. M marginal means = 75.9 lb./ac.
   2. K marginal means = 44.2 lb./ac.
   3. K means at the same level of M = 139.7 lb./ac.
   4. M means at the same level of K = 164.7 lb./ac.

   Crop: Tobacco.

   Site: Cigar and Cheroot Tobacco Res. Stn., Vedasandur. Type: 'M0'.


   Object: To study the effect of different sources of K with other fertilizers on cigar Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Cumbu—Tobacco. (b) Cumbu. (c) Nil. (ii) (e) Grey gravelly loam. (b) N.A. (iii) 13.10.1955. (iv) (a) 4 ploughings. (b) Transplanting. (c) 8,712 plants/ac. (d) 30'x24'. (e) 1. (f) Nil. (i) Vellavazhal. (ii) Irrigated. (vii) 1 weeding, 1 hoeing, mummati digging, earthing up and topping. (ix) 15.03'. (x) 22.12.1956.

2. TREATMENTS:
   Same as in exp. no 54(22) on page 505.
3. DESIGN:
   (i) Split-plot. (ii) 5 main-plots/replication ; 5 sub-plots/main-plot. (b) 100'×12'. (iii) 5. (iv) (a) 15'×10'. (b) 15'×6'. (v) 2'×2'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of cured leaf. (iv) (a) 1954–1956. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Commencement of monsoon was late. (vii) Nil.

5. RESULTS:
   (i) 2186 lb./ac. (ii) 255.0 lb./ac. (iii) 188.0 lb./ac. (iv) (a) 1954-1956. (v) (a) and (b) N.A. (vi) Commencement of monsoon was late. (vii) Nil.

   Site: Cigar and Cheroor Tobacco Res. Stn., Vedasandur. Type: M.
   Object: To study the effect of different sources of K with other fertilizers on cigar Tobacco.

   1. BASAL CONDITIONS:
      (i) (a) Cumbu—Tobacco. (b) Cumbu. (c) Nil. (ii) (a) Grey gravelly loam. (b) N.A. (iii) 20.10.1956. Gaps filled on 30.10.1956. (iv) (a) 4 ploughings. (b) Transplanting. (c) 8,712 plants/ac. (d) 30'×24'.

   2. TREATMENTS:
      Same as in exp. no. 54(12) on page 565.

   3. DESIGN:
      (i) Split-plot. (ii) (a) 5 main-plots/replication ; 5 sub-plots/main-plot. (b) N.A. (iii) 6 (effective replications are 4). (iv) (a) 19'×10'. (b) 15'×6'. (v) 2'×2'. (vi) Yes.

   4. GENERAL:
      (i) Normal. (ii) Nil. (iii) Yield of cured leaves. (iv) (a) 1954–1956. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Excessive rains soon after transplanting. Growth in 2 replications vitiated completely and hence they are omitted. (vii) Nil.

   5. RESULTS:
      (i) 2617 lb./ac. (ii) (a) 227.3 lb./ac. (b) 169.7 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of cured leaf in lb./ac.
Site: Cigar and Cheroott Tobacco Res. Sta., Vedasandur. Type: 'M'.

Object: To study the effect of different sources of N with other fertilizers on cigar Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—White chom. (b) White chom. (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) 23.10.1954.
   (iv) (a) 4 ploughings. (b) Transplanting. (c) N.A. (d) 2'X2'. (e) l. (vi) Nl. (vi) Peltisapor (Nicotiana tabacum). (vii) Irrigated. (viii) Weeding, hoeing, mumminti digging, earthing up and topping. (ix) 6.30'.
   (x) 27.1.1955.

2. TREATMENTS:
   Main-plot treatments: 4 manural treatments: M₄=Control, M₅=20 C.L./ac. of F.Y.M., M₆=100 lb./ac. of K₂O as Pot. Sul. and M₇=100 lb./ac. of P₂O₅ as Super.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 19'X10', (b) 15'X6'. (v) 2'X2'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) During the earlier periods of growth there was a slight attack of stem borer. It was brought under control by removing the borer from the plant. Soon after topping there was a slight attack of aphids. The borer was brought under control by spraying tobacco decoction. (iii) Yield of tobacco. (iv) (a) 1955—1956 (expts. for the years 1955 and 1956 failed). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2058 lb./ac. (ii) 373.0 lb./ac. (b) 247.0 lb./ac. (iii) S effect alone is highly significant. (iv) Av. yield of cured leaf in lb./ac.
S.E. of difference of two
1. M marginal means = 76.5 lb./ac.
2. S marginal means = 61.8 lb./ac.
3. S means at the same level of M = 174.6 lb./ac.
4. M means at the same level of S = 192.4 lb./ac.

Site: Cigar and Cheroot Tobacco Res. Stn., Vedasandur. Type: "M".

Object: To investigate the influence of nitrogenous manures on the yield, composition and burning quality of cigar Tobacco.

1. BASAL CONDITIONS:
(i) (a) Tobacco—Cumbu. (b) Cumbu (Pennisetum typhoides). (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) 30.10 1954. (iv) (a) 4 ploughings. (b) Transplanting. (c) N.A. (d) 2.5' x 2'. (e) I. (v) Nil. (vi) Velavasal (local). (vii) Irrigated. (viii) Weeding, hoeing, mummati digging, earthing up and topping. Suckering was done periodically and Orobanche, a root parasite in tobacco was removed at frequent intervals. (ix) 6.21. (x) 5.2.1955.

2. TREATMENTS:
Main-plot treatments: 5 manurial treatments: M₀ = Control (no manure), M₁ = 20 C.L./ac. of F.Y.M., M₂ = 100 lb./ac. of K₂O as Pot. Sul., M₃ = 100 lb./ac. of P₂O₅ as Super and M₄ = M₂ + M₃.
Sub-plot treatments: 6 sources of 100 lb./ac. of N: S₀ = Control (no application), S₁ = AJS, S₂ = Blood meal, S₃ = Fish meal, S₄ = Stera meal and S₅ = Urea.
F.Y.M. broadcast 1 month before transplanting and other fertilizers applied in bands at transplanting. Nitrogen applied in split doses, 1 at transplanting and 1 at the time of mummati digging.

3. DESIGN:
(i) Split-plot. (ii) (a) 5 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 19' x 10', (b) 15' x 6', (v) 2' x 2'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) During the earlier periods of growth there was slight attack of stem borer. It was brought under control by removing the borer from the affected plants. (iii) Yield of tobacco. (iv) (a) 1954—1956. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Stand differences were significant, hence results were calculated by the method of covariance.

5. RESULTS:
(i) 2326 lb./ac. (ii) (a) 426.0 lb./ac. (b) 149.0 lb./ac. (iii) Main effect of S and interaction M x S are significant. (iv) Av. yield of cured leaf in lb./ac.
Crop :- Tobacco.  
Site :- Cigar and Cheroot Tobacco Res. Sta., Vedasandur.  
Type :- 'M'.

Object :- To investigate the influence of nitrogenous manures on the the yield, composition and burning quality of cigar Tobacco.

1. BASAL CONDITIONS :
   (i) (a) Cumbu—Tobacco. (b) Cumbu. (c) Nil. (ii) (a) Grey gravelly loam. (b) N.A. (iii) 5.11.1955.
   (iv) (a) 4 ploughings. (b) Transplanting. (c) 8,712 plants/ac. (d) 30" × 24". (e) 1. (v) Nil. (vi) 
   Vellarathai (Nicotiana tabacum). (vii) Irrigated. (viii) Weeding, hoeing, mundmati digging and earthing up. 
   (ix) 8.25'. (x) 14.2.1956.

2. TREATMENTS and 3. DESIGN :
   Same as in exp. no. 54(21) on page 560.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Yield of tobacco. (iv) (a) 1954 –1956. (b) Yes. (c) Nil. (v) (a) and (b) N.A. 
   (vi) and (vii) Nil.

5. RESULTS :
   (i) 2588 lb./ac. (ii) (a) 389.0 lb./ac. (b) 183.0 lb./ac. (iii) Main effect of S alone is significant. (iv) Av. yield 
   of cured leaf in lb./ac.

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<th>S₁</th>
<th>S₂</th>
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S.E. of difference of two
1. M marginal means = 112.3 lb./ac. 
2. S marginal means = 57.9 lb./ac. 
3. S means at the same level of M = 129.4 lb./ac. 
4. M means at the same level of S = 163.0 lb./ac.
Crop: Tobacco.  
Site: Cigar and Cheroot Tobacco Res. Sta., Vedasattdur.  Type: 'M'.

Object: To investigate the influence of different nitrogenous manures on the yield, chemical composition and quality of cigar Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil.  (ii) (a) Red loam. (b) N.A.  (iii) 30.10.1956.  (iv) (a) 4 ploughings. (b) Transplanting.  (c) 8,712 plants/ac.  (d) 30' x 24'.  (e) N.A.  (v) Nil.  (vi) Villavazhai.  (vii) Irrigated.  (viii) I hand weeding, mummati digging and topping.  (ix) N.A.  (x) 23.2.1957.

2. TREATMENTS and 3. DESIGN: Same as in exp. no. 54(24) on page 569.

4. GENERAL:
   (i) Poor.  (ii) Nil.  (iii) Yield of cured leaves.  (iv) (a) 1954-1956.  (b) Yes.  (c) Nil.  (v) (a) and (b) N.A.  (vi) During the first half of the year rainfall was poor.  (vii) Nil.  (viii) 1 hand weeding, mummati digging, earthing up and topping.  (ix) N.A.  (x) 6.2.1956.

5. RESULTS:
   (i) 2632 lb./ac.  (ii) (a) 930.9 lb./ac.  (b) 553.7 lb./ac.  (iii) Main effect of S alone is highly significant.  (iv) Avg. yield of cured leaf in lb./ac.

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S.E. of difference of two
1. M marginal means = 268.7 lb./ac.
2. S marginal means = 175.1 lb./ac.
3. S means at the same level of M = 391.5 lb./ac.
4. M means at the same level of S = 447.2 lb./ac.
3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 26.5' x 15'. (b) 22.5' x 12'. (v) 2' x 12'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of cured leaves of tobacco. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 183.5 lb./ac. (ii) 143.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
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<th>M₂</th>
<th>M₃</th>
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<td>S.E./mean</td>
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Site:— Cigar and Cheroot Tobacco Res. Stn., Vedasandur. Type:— M'.
Object:— To study the residual effect of different measures applied to cumbu crop on succeeding cigar Tobacco crop.

1. BASAL CONDITIONS:
(i) (a) Tobacco—Cumbu (2 crops)—Tobacco. (b) Cumbu (July—Sept.). (c) Nil. (ii) (a) Reddish brown sandy loam. (b) N.A. (iii) 16.11.1951. (iv) (a) 4 ploughings. (b) Transplanting. (c) N.A. (d) 26.5' x 12'. (e) 1. (v) 6.70 tons/ha. of F.Y.M. + 100 lb./ac. of N as A/S. (vi) Vellarasai. (vii) Irrigated. (viii) Weeding hoeing, munmati digging and topping. (ix) 16.22'. (x) 5.3.1956.

2. TREATMENTS:
Same as in exp. no. 54(25) on page 571.

5. RESULTS:
(i) 2171 lb./ac. (ii) 107.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaves in lb./ac.

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Crop:— Tobacco.  Ref:— C.T.R.I. 54(26).
Site:— Cigar and Cheroot Tobacco Res. Stn., Vedasandur. Type:— M'.
Object:— To compare the response of chewing Tobacco to different sources of N with and without F.Y.M.

1. BASAL CONDITIONS:
(i) (a) Tobacco—Cumbu. (b) Cumbu. (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) 1.11.1954. (iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 2.5' x 2'. (e) 1. (v) Nil. (vi) Fumonit (Nicotiana tabacum). (vii) Irrigated. (viii) 1 hand weeding, 1 hoeing, 1 topping, suckering and orobanche removal. (ix) 5.38'. (x) 10.2.1955.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 sources of 100 lb./ac. of N : S₀=Control (no application), S₁=A/S, S₂=C/N and S₃=A/S/N.
(2) 2 levels of F.Y.M.: F₀=0 and F₁=10 C.L./ac.
F.Y.M. broadcast 1 month before planting. Nitrogen applied in 2 equal doses, broadcast at planting and top dressed 6 weeks after planting.
3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 30' x 15/4'. (b) 25' x 10'. (v) 1 row all round. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Spraying with DDT 550 was done as a safeguard against leaf eating caterpillar and stem borer. (iii) Yield of tobacco. (iv) (a) 1952—1954. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2004 lb./ac. (ii) 186.0 lb./ac. (iii) Main effect of F alone is highly significant. (iv) Av. yield of cured leaf in lb/ac.

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S.E. of S marginal mean = 53.6 lb./ac.
S.E. of F marginal mean = 37.9 lb./ac.
S.E. of body of table = 75.9 lb./ac.

---

Crop: Tobacco.  
Ref: G.T.R.I. 54(27).  
Site: Cigar and Cheroot Tobacco Res. Sta., Vedasandur. Type: ‘M’.

Object: To study the fertilizer value of indigenous rock phosphate as compared to Super and B.M. on chewing Tobacco.

1. BASAL CONDITIONS:
(i) (a) Tobacco—Groundnut. (b) Groundnut. (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) 17.11.1954. (iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 2.5' x 2'. (e) I. (v) 20 C.L./ac. of F.Y.M. (vi) Valmonnai (Nicotiana tabacum). (vii) Irrigated. (viii) 1 hand weeding, 1 hoeing, 1 topping and suckering. (ix) 5.38'. (x) 8.3.1955.

2. TREATMENTS:
Same as in exp. no. 54(70) on page 564.

3. DESIGN:
(i) R B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 20' x 17/4'. (b) 15' x 12}'. (v) 1 row all round. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Regular spraying with DDT 550 was done as a safeguard against leaf caterpillar and stem borer. (iii) Yield of tobacco. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2144 lb./ac. (ii) 254.0 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1607</td>
<td>2115</td>
<td>2207</td>
<td>2224</td>
<td>2130</td>
<td>2114</td>
<td>2064</td>
<td>2398</td>
</tr>
</tbody>
</table>

S.E./mean = 103.7 lb./ac.
Crop: Tobacco.  

Site: Cigar and Cheroot Tobacco Res. Stn., Vedasandur.  
Type: 'M'.

Object: To study the fertilizer value of indigenous rock phosphate as compared to Super and B.M. on chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil.  
   (b) Groundnut.  
   (c) N.A.  
   (ii) (a) Red loam.  
   (b) N.A.  
   (iv) (a) 4 ploughings.  
   (b) Transplanting.  
   (c) 8712 plants/ac.  
   (d) 30' x 24'.  
   (e) 1. (v) 20 C.I./ac. of F.Y.M.  
   (vi) M.  
   (vii) Irrigated.  
   (viii) 1 hand weeding, monsoon digging, earthing up, topping and suckering.  
   (ix) N.A.  
   (X) 22 to 27.3.1957.

2. TREATMENTS:
   Same as in exp. no. 54(20) on page 564.

3. DESIGN:
   (ii) R.B.D.  
   (ii) (a) 8, (b) N.A.  
   (iii) 6.  
   (iv) (a) 20' x 17'.  
   (b) 15' x 12'.  
   (v) 1 row all round.  
   (vi) Yes.

4. GENERAL:
   (i) Slightly below normal.  
   (ii) Leaf curl and mosaic.  
   (iii) Cured leaf yield.  
   (iv) (a) 1953—1955  
   (b) Yes.  
   (c) Nil.  
   (d) and (e) N.A.  
   (vi) Monsoon was late.  
   (vii) Nil.

5. RESULTS:
   (i) 194~ lb./ac.  
   (ii) 271.9 lb./ac.  
   (iii) Treatment differences are not significant.  
   (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M2</th>
<th>M1</th>
<th>M4</th>
<th>M3</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1695</td>
<td>2009</td>
<td>1836</td>
<td>2063</td>
<td>1845</td>
<td>1911</td>
<td>2072</td>
</tr>
<tr>
<td>S.E.(mean)</td>
<td>111.0 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Tobacco (Rabij).  

Site: Hookah and Chewing Tobacco Res. Stn., Pusa.  
Type: 'MV'.

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil.  
   (b) Sannhemp (G.M.).  
   (c) G.M.  
   (ii) (a) Indo-gangetic alluvium calcareous.  
   (b) N.A.  
   (iii) 1.10.1958.  
   (iv) (a) 4 ploughings.  
   (b) Transplanting.  
   (c) 4 lb/ac.  
   (d) 3' x 2'.  
   (e) 1. (f) G.M. with sannhemp,  
   (v) As per treatments.  
   (vi) Irrigated.  
   (vii) 1 hand weeding, topping and suckering.  
   (viii) 2 levels of N as (i) 0 and (ii) 50 lb./ac.  
   (v) G.M. with sannhemp.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of N as (i) as A/S+1 as Mustard cake : N50=0 and N5=50 lb./ac.
   Sub-plot treatments:
   5 varieties: V1=Northwa Sararanjan, V2=Bori bhara 93, V3=Bori bhara 10, V4=Bori Mallnagar Thahra and V5=Cultivator’s bulk.

3. DESIGN:
   (i) Split-plot.  
   (ii) (a) 2 main-plots/replication; 5 sub-plots/main-plot.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) 15' x 30'.  
   (b) 9' x 26'.  
   (v) One row all round.  
   (vi) Yes.

4. GENERAL:
   (i) Good.  
   (ii) Leaf curl and mosaic.  
   (iii) Cured leaf yield.  
   (b) Yes.  
   (c) Nil.  
   (d) and (e) N.A.  
   (v) Nil.

5. RESULTS:
   (i) 2066 lb./ac.  
   (ii) 264.4 lb./ac.  
   (iii) Nil.  
   (iv) None of the effects is significant.  
   (v) Av. yield of cured leaf in lb./ac.
Crop :- Tobacco.

Site :- Hookah and Chewing Tobacco Res. Sta., Pusa.

Object :- To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Sannhemp. (c) Nil. (d) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 22.9.1959.
   (iv) (a) 5 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3'x2'. (e) 1. (f) G.M. with sannhemp. (g) As per treatments. (h) Irrigated. (i) 3 weedings, topping and suckering. (j) 2.017. (k) 4.3.1960.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 2 levels of N (1 as A/S+1 as mustard cake) : N1=0 and N2=50 lb./ac.
   (2) 5 varieties : V1 = Narhwa Sararaoj, V2 = Bori bharao 93, V3 = D.P. 401, V4 = Bori Malinagar Talbara and V5 = Cultivator's bulk.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 15'x30'. (b) 9'x26'. (v) 3'x2'. (vi) Yes.

4. GENERAL :
   Same as in exp. no. 50(109) on page 574.

5. RESULTS :
   (i) 2592 lb./ac. (ii) 424.4 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of cured leaf in lb./ac.

\[
\begin{array}{c|ccccc|c}
 & N_1 & N_2 & N_3 & N_4 & N_5 & \text{Mean} \\
\hline
V_1 & 2368 & 2568 & 2286 & 2417 & 2535 & 2437 \\
V_2 & 2731 & 2690 & 2987 & 2804 & 2522 & 2747 \\
\hline
\text{Mean} & 2550 & 2629 & 2637 & 2616 & 2529 & 2592 \\
\end{array}
\]

S.E. of N marginal mean = 94.9 lb./ac.
S.E. of V marginal mean = 140.8 lb./ac.
S.E. of body of table = 212.2 lb./ac.

---

Crop :- Tobacco (Rabi).

Site :- Central Tobacco Res. Sta., Rajahmundry.

Object :- To test the effect of N alone and in combination with P and K on different varieties of Tobacco.
1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) 20 lb./ac. of N as A/S was applied in ploughed furrows. (ii) (a) Deep black soil. (b) N.A. (iii) N.A./15.11.1955. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33' x 33'. (e) I. (v) N/A. (vi) As per treatments. (vii) Unirrigated. (viii) 2 hand weedings and 2 intercultures with planet junior hoe. (ix) 0.05'. (x) 31.1.1956 to 15.3.1956.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of fertilizer: F₁ = 20 lb./ac. of N as A/S and F₂ = 20 lb./ac. of N as A/S + 100 lb./ac. of K₂O as Super, 50 lb./ac. of K₂O as Pot. Sul.
   (2) 2 varieties of cigarette tobacco: V₁ = Chatham and V₂ = Harrison special (medium).

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) 57'9" x 99'. (b) 51'3" x 93'6". (v) 33' x 21'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) and (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 4035 lb./ac. (ii) 65.1 lb./ac. (iii) Main effect of N and interaction F X V are highly significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>F₁</th>
<th>F₂</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
<td>V₁</td>
<td>4341</td>
<td>4049</td>
<td>4195</td>
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<tr>
<td>V₂</td>
<td>3761</td>
<td>3986</td>
<td>3874</td>
</tr>
<tr>
<td>Mean</td>
<td>4051</td>
<td>4018</td>
<td>4035</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 32.6 lb./ac.
S.E. of body of table = 46.1 lb./ac.

Crop: Tobacco (Rabi).
Centre: Samastipur (Darbhanga, c.f.).
Type: MV'.
Object: To study the effect of different levels of N on different varieties of Tobacco.
5. RESULTS:

(i) 1322 lb/ac. (ii) (a) 123.4 lb/ac. (b) 126.2 lb/ac. (iii) Main effects of N and V are highly significant. (iv) Av. yield of cured leaf in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>$V_4$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>1151</td>
<td>1329</td>
<td>1167</td>
<td>931</td>
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<tr>
<td>$N_1$</td>
<td>1288</td>
<td>1580</td>
<td>1839</td>
<td>1629</td>
<td>1329</td>
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<tr>
<td>Mean</td>
<td>1130</td>
<td>1366</td>
<td>1584</td>
<td>1398</td>
<td>1131</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. N marginal means = 39.0 lb/ac.
2. V marginal means = 63.1 lb/ac.
3. V means at the same level of N = 89.2 lb/ac.
4. N means at the same level of V = 88.8 lb/ac.

Crop: Tobacco.
Centre: Samastipur (Darbanga, c.f.).
Ref: C.T.R.I. 58(13).
Type: •MV'.

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS to 4. GENERAL:
Same as in exp. no. 58(12) on page 576.

5. RESULTS:

(i) 1292 lb/ac. (ii) (a) 99.3 lb/ac. (b) 230.7 lb/ac. (iii) Main effect of N is highly significant and that of V is significant. (iv) Av. yield of cured leaf in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>$V_4$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>1257</td>
<td>1182</td>
<td>1494</td>
<td>1408</td>
<td>1106</td>
</tr>
<tr>
<td>$N_1$</td>
<td>1399</td>
<td>1418</td>
<td>1664</td>
<td>1654</td>
<td>1342</td>
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<tr>
<td>Mean</td>
<td>1328</td>
<td>1300</td>
<td>1579</td>
<td>1531</td>
<td>1224</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. N marginal means = 31.4 lb/ac.
2. V marginal means = 115.5 lb/ac.
3. V means at the same level of N = 163.5 lb/ac.
4. N means at the same level of V = 149.3 lb/ac.

Crop: Tobacco (Rabi).
Centre: Samastipur (Darbanga, c.f.).
Type: •MV'.

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS:

(i) (a) and (b) N.A. (c) Nil. (ii) Sandy loam. (iii) N.I. (iv) As per treatments. (v) (b) Transplanting. (c) 4 lb/ac. (d) 3'E'. (e) 1. (vi) 1.10.1958. (vii) and (v) 3.3.1959.
2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 58(12) on page 576.

5. RESULTS:
(i) 1436 lb./ac. (ii) (a) 149.4 lb./ac. (b) 200.2 lb./ac. (iii) Main effects of N and V are highly significant.
(iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>N0</td>
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<td>1313</td>
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<td>1426</td>
<td>1507</td>
<td>1936</td>
<td>1693</td>
<td>1321</td>
<td>1577</td>
</tr>
<tr>
<td>Mean</td>
<td>1321</td>
<td>1410</td>
<td>1714</td>
<td>1560</td>
<td>1175</td>
<td>1436</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 47.2 lb./ac.
2. V marginal means = 100.1 lb./ac.
3. V means at the same level of N = 141.6 lb./ac.
4. N means at the same level of V = 135.1 lb./ac.

---

Crop: Tobacco (Rabi).
Centre: Samastipur (Darbhanga, c.f.).
Type: MV'.

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS to 4. GENERAL:
Same as in expt. no. 58(14) on page 577.

RESULTS:
(i) 2030 lb./ac. (ii) (a) 100.3 lb./ac. (b) 215.4 lb./ac. (iii) Main effects of N and V are highly significant.
(iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>Mean</th>
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<tbody>
<tr>
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<td>1938</td>
<td>2117</td>
<td>1975</td>
<td>1588</td>
<td>1926</td>
</tr>
<tr>
<td>N1</td>
<td>2108</td>
<td>1919</td>
<td>2618</td>
<td>2316</td>
<td>1711</td>
<td>2134</td>
</tr>
<tr>
<td>Mean</td>
<td>2061</td>
<td>1929</td>
<td>2368</td>
<td>2146</td>
<td>1650</td>
<td>2030</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 31.7 lb./ac.
2. V marginal means = 107.7 lb./ac.
3. V means at the same level of N = 152.1 lb./ac.
4. N means at the same level of V = 159.9 lb./ac.

---

Crop: Tobacco (Rabi).
Centre: Samastipur (Darbhanga, c.f.).
Type: MV'.

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS to 4. GENERAL:
Same as in expt. no. 58(12) on page 576.
5. RESULTS:

(i) 1726 lb./ac.  (ii) (a) 234.4 lb./ac.  (b) 209.4 lb./ac.  (iii) Main effects of N and V are significant. (iv) 
Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
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<tbody>
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<td>1899</td>
<td>1983</td>
<td>1940</td>
<td>1630</td>
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<td>1819</td>
<td>1702</td>
<td>1837</td>
<td>1768</td>
<td>143</td>
<td>1726</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 74.1 lb./ac.
2. V marginal means = 104.7 lb./ac.
3. V means at the same level of N = 148.1 lb./ac.
4. N means at the same level of V = 151.8 lb./ac.

Crop: Tobacco (Rabi).
Centre: Samastipur (Darbhanga, c.f.).
Ref: C.T.R.I. 59(12).
Type: ‘M’.

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITION:
   (i) to (c) N.A.  (ii) Sandy loam.  (iii) Nil.  (iv) As per treatments.  (v) (a) 4 ploughings: Transplanting.  (c) 4 lb./ac.  (d) 3’ x 2’.  (e) 1.  (vi) 20.9.1959.  (vii) and (viii) N.A.  (ix) 1 (x) 24.2.1960.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of N: (a) A/S + ] as mustard cake: N₀ = 0 and N₁ = 50 lb./ac.
(2) 5 varieties: V₁ = Narsingh Sararanjan, V₂ = Bori bharao—92, V₃ = Bori bharao—10, V₄ = Bori Me Thaira and V₅ = Cultivator’s bulk.

3. DESIGN:
   (i) and (ii) Fact. in R.B.D. with 4 replications.  (iii) (a) 15’ x 30’.  (b) 9’ x 26’.  (iv) Yes.

4. GENERAL:
   (i) N.A.  (ii) Leaf curl and mosaic.  (iii) Yield of cured leaf.  (iv) (a) 1958—1959.  (b) and (c) N  (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1466 lb./ac.  (ii) 327.8 lb./ac.  (iii) Main effect of V alone is highly significant.  (iv) Av. yield of leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
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<td>1313</td>
<td>1705</td>
<td>1547</td>
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</table>

S.E. of N marginal mean = 73.3 lb./ac.
S.E. of V marginal mean = 115.9 lb./ac.
S.E. of body of table = 163.9 lb./ac.
Crop: Tobacco (Rabi).
Centre: Samastipur (Darbhanga c.f.).

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) and (b) N.A. (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) As per treatments. (v) (a) 4 ploughings. (b) Transplanting. (c) 4 lb/ac. (d) 3’ x 2’. (e) 1. (vi) 3.10.1959. (vii) and (viii) N.A. (ix) 19.2.1960.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 59(12) on page 579.

3. RESULTS:
   (i) 232 lb/ac. (ii) 201.8 lb/ac. (iii) Main effects of N and V are highly significant. (iv) Av. yield of cured leaf in lb/ac.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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<tbody>
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<td>V3</td>
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<td>V6</td>
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<tr>
<td>Mean</td>
<td>2985</td>
<td>2974</td>
<td>3294</td>
<td>3092</td>
</tr>
</tbody>
</table>

   S.E. of V marginal mean = 68.6 lb/ac.
   S.E. of N marginal mean = 43.4 lb/ac.
   S.E. of body of table = 97.0 lb/ac.

Crop: Tobacco (Rabi).
Centre: Samastipur (Darbhanga c.f.).

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (e) N.A. (ii) Sandy loam. (iii) Nil. (iv) As per treatments. (v) (a) 5 ploughings. (b) Transplanting (c) 4 lb/ac. (d) 3’ x 2’. (e) 1. (vi) 3.10.1959. (vii) and (viii) N.A. (ix) 19.2.1960.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 59(12) on page 579.

3. RESULTS:
   (i) 232 lb/ac. (ii) 201.8 lb/ac. (iii) Main effect of N is highly significant and that of V is significant. (iv) Av. yield of cured leaf in lb/ac.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>V1</td>
<td>V2</td>
<td>V3</td>
<td>V4</td>
<td>V6</td>
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<tr>
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<tr>
<td>N0</td>
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<td>2280</td>
<td>2070</td>
</tr>
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<tr>
<td>Mean</td>
<td>2188</td>
<td>2268</td>
<td>2510</td>
<td>2177</td>
</tr>
</tbody>
</table>

   S.E. of V marginal mean = 71.3 lb/ac.
   S.E. of N marginal mean = 45.1 lb/ac.
   S.E. of body of table = 100.9 lb/ac.
Crop: Tobacco (Rabi).
Centre: Samastipur (Darbhanga, c.f.).
Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS to 4. GENERAL:
Same as in expt. no. 59(12) on page 579.

5. RESULTS:
(i) 1743 lb./ac. (ii) 262.0 lb./ac. (iii) Main effect of N is highly significant and that of V is significant. (iv) Av. yield of cured leaf in lb./ac.

\[
\begin{array}{cccccc}
V_1 & V_2 & V_3 & V_4 & V_5 & \text{Mean} \\
N_0 & 1539 & 1484 & 1726 & 1645 & 1263 & 1531 \\
N_1 & 1881 & 1856 & 2260 & 1978 & 1799 & 1955 \\
\text{Mean} & 1710 & 1670 & 1993 & 1812 & 1531 & 1743 \\
\end{array}
\]

S.E. of V marginal mean = 92.6 lb./ac.
S.E. of N marginal mean = 58.6 lb./ac.
S.E. of body of table = 131.0 lb./ac.

Crop: Tobacco (Rabi).
Centre: Hazipur (Muzaffarpur, c.f.).
Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS to 4. GENERAL:
Same as in expt. no. 59(12) on page 579.

5. RESULTS:
(i) 2224 lb./ac. (ii) 281.2 lb./ac. (iii) Main effects of N and V are highly significant. (iv) Av. yield of cured leaf in lb./ac.

\[
\begin{array}{cccccc}
V_1 & V_2 & V_3 & V_4 & V_5 & \text{Mean} \\
N_0 & 1887 & 2015 & 2156 & 2141 & 1660 & 1980 \\
N_1 & 2478 & 2487 & 2685 & 2586 & 2097 & 2467 \\
\text{Mean} & 2183 & 2251 & 2441 & 2364 & 1879 & 2224 \\
\end{array}
\]

S.E. of N marginal mean = 62.9 lb./ac.
S.E. of V marginal mean = 99.4 lb./ac.
S.E. of body of table = 140.6 lb./ac.
1. BASAL CONDITIONS:
   (i) (a) and (b) N.A. (c) Nil. (ii) Sandy loam. (iii) Nil. (iv) As per treatments. (v) (a) 5 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3'x2'. (e) 1. (vi) 1.10.1958. (vii) to (ix) N.A. (x) 3.3.1959.

2. TREATMENTS:

   Main-plot treatments:
   - 2 levels of N (1/2 as AS+ 1/2 as mustard cake) : N₁ = 0 and N₂ = 50 lb./ac.

   Sub-plot treatments:
   - 5 varieties: V₁ = Narhwa Samranjn V₂ = Bori bhurao—93, V₃ = Bori bhurao—10, V₄ = Bori Muliangar and V₅ = Cultivator’s bakk.

3. DESIGN:
   (i) and (ii) Split-plot; 2 main-plots/replication, 5 sub-plots/main-plot and 4 replication. (iii) (a) 15' x 30'. (b) 9' x 26'. (iv) Yes.

4. GENERAL:
   (i) N.A. (ii) Leaf curl and mosaic. (iii) Yield of cured leaf. (iv) (a) 1951—1959. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

   (i) 2834 lb./ac. (ii) (a) 191.7 lb./ac. (b) 256.1 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
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</table>

   S.E. of difference of two:
   1. N marginal means = 60.6 lb./ac.
   2. V marginal means = 128.0 lb./ac.
   3. V means at the same level of N = 181.1 lb./ac.
   4. N means at the same level of V = 172.9 lb./ac.

---

Centre: Hajipur (Muzaffarpur, c.f.). Type: ‘MV’.

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Sandy loam. (iii) Nil. (iv) As per treatments. (v) (a) 3 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3' x 2'. (e) 1. (vi) 1.10.1958. (vii) to (ix) N.A. (x) 3.3.1959.

2. TREATMENTS to 4. GENERAL:
   Same as in expl. no. 58(17) on page 581.

5. RESULTS:

   (i) 3209 lb./ac. (ii) (a) 217.2 lb./ac. (b) 274.3 lb./ac. (iii) Main effects of N and V are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
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<td>3622</td>
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</table>
Crop: Tobacco (Rabi).
Centre: Hajipur (Muzaffarpur, e.f.).

Object: To study the effect of different levels of N on different varieties of Tobacco.

I. BASAL CONDITIONS to 4. GENERAL:
Same as in expt. no. 58(18) on page 582.

5. RESULTS:
(i) 2658 lb./ac. (ii) (a) 204.6 lb./ac. (b) 265.3 lb./ac. (iii) Main effects of N and V are highly significant.
(iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
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S.E. of difference of two
1. N marginal means = 71.2 lb./ac.
2. V marginal means = 137.1 lb./ac.
3. V means at the same level of N = 1940 lb./ac.
4. N means at the same level of V = 187.5 lb./ac.

---

Crop: Tobacco (Rabi).
Centre: Hajipur (Muzaffarpur, c.f.).

Type: 'MV'.

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS to 4. GENERAL:
Same as in expt. no. 58(18) on page 582.

5. RESULTS:
(i) 2987 lb./ac. (ii) (a) 169.4 lb./ac. (b) 232.2 lb./ac. (iii) Main effects of N and V are highly significant.
(iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>V1</th>
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<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>Mean</th>
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<td>2828</td>
<td>2909</td>
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</tbody>
</table>
Crop: Tobacco (Rabi).  
Centre: Hajipur (Muzaffarpur, c.f.).  
Ref: C.T.R.I. 58(21).  
Type: ‘MV’.  

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.
   (ii) Sandy loam.
   (iii) Nil.
   (iv) As per treatments.
   (v) (a) 4 ploughings.  
   (b) Transplanting.  
   (c) 4 lb./ac.  
   (d) 3’ X 2’.  
   (e) 1.
   (vi) 3.10.1958.
   (vii) to (ix) N.A.
   (x) 4.3.1959.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of N (as A/S+1 as Mustard cake):
      N₀=0 and N₁=50 lb./ac.
   (2) 5 varieties: V₁=Narhwa Sararanjan, V₂=Bori bharao—93, V₃=Bori bharao—10, V₄=Bori Mal- 
      nagar Thahra and V₅=Cultivator's bulk.

3. DESIGN:
   (i) and (ii) Fact. in R.B.D. with 4 replications.
   (iii) (a) 15’ X 30’.  
   (b) 9’ X 26’.  
   (iv) Yes.

4. GENERAL:
   (i) N.A.
   (ii) Leaf curl and mosaic.
   (iii) Yield of cured leaf.
   (iv) (a) 1958—1959.

---

Crop: Tobacco (Rabi).  
Centre: Hajipur (Muzaffarpur, c.f.).  
Ref: C.T.R.I. 59(17).  
Type: ‘MV’.  

Object: To study the effect of A/S and mustard cake on different varieties of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.
   (ii) Sandy loam.
   (iii) Nil.
   (iv) As per treatments.
   (v) (a) 4 ploughings.  
   (b) Transplanting.  
   (c) 4 lb./ac.  
   (d) 3’ X 2’.  
   (e) 1.
   (vi) 3.10.1959.
   (vii) to (ix) N.A.
   (x) 5.3.1960.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of N (as A/S+1 as Mustard cake):
      N₀=0 and N₁=50 lb./ac.
   (2) 5 varieties: V₁=Narhwa Sararanjan, V₂=Bori bharao—93, V₃=Bori bharao—10, V₄=Bori Mali-
      nagar Thahra and V₅=Cultivator's bulk.

3. DESIGN:
   (i) and (ii) Fact. in R.B.D. with 4 replications.
   (iii) (a) 15’ X 30’.  
   (b) 9’ X 26’.  
   (iv) Yes.

4. GENERAL:
   (i) N.A.
   (ii) Leaf curl and mosaic.
   (iii) Yield of cured leaf.
   (iv) (a) 1958—1959.

---

S.E. of difference of two
1. N marginal means  53.6 lb./ac.
2. V marginal means  116.1 lb./ac.
3. V means at the same level of N  164.2 lb./ac.
4. N means at the same level of V  156.3 lb./ac.

---

Crop: Tobacco (Rabi).  
Centre: Hajipur (Muzaffarpur, c.f.).  
Ref: C.T.R.I. 58(21).  
Type: ‘MV’.  

Object: To study the effect of different levels of N on different varieties of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.
   (ii) Sandy loam.
   (iii) Nil.
   (iv) As per treatments.
   (v) (a) 4 ploughings.  
   (b) Transplanting.  
   (c) 4 lb./ac.  
   (d) 3’ X 2’.  
   (e) 1.
   (vi) 3.10.1958.
   (vii) to (ix) N.A.
   (x) 4.3.1959.

2. TREATMENTS:
   (i) 2588 lb./ac.
   (ii) (a) 705.0 lb./ac.
   (b) 302.0 lb./ac.
   (iii) Main effect of V alone is significant.
   (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
<th>Mean</th>
</tr>
</thead>
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<td>2391</td>
<td>3112</td>
<td>2650</td>
<td>2398</td>
<td>2598</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means  222.9 lb./ac.
2. V marginal means  151.0 lb./ac.
3. V means at the same level of N  213.5 lb./ac.
4. N means at the same level of V  293.3 lb./ac.

---

Crop: Tobacco (Rabi).  
Centre: Hajipur (Muzaffarpur, c.f.).  
Ref: C.T.R.I. 58(17).  
Type: ‘MV’.  

Object: To study the effect of A/S and mustard cake on different varieties of Tobacco.
5. RESULTS:

(i) 2375 lb./ac.  (ii) 95.0 lb./ac.  (iii) Main effects of N and V are highly significant.  (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>Mean</th>
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</thead>
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<td>2664</td>
<td>2521</td>
<td>2387</td>
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</tbody>
</table>

S.E. of N marginal mean = 21.2 lb./ac.
S.E. of V marginal mean = 33.6 lb./ac.
S.E. of body of table = 47.5 lb./ac.

Crop = Tobacco (Rabi).
Centre = Hajipur (Muzaffarpur, c.f.).
Object = To study the effect of A/S and mustard cake on different varieties of Tobacco.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A.  (ii) Sandy loam.  (iii) Nil.  (iv) As per treatments.  (v) (a) 4 ploughings.  (b) Transplanting.  (c) 4 lb./ac.  (d) 3' X 2'.  (e) 1.  (vi) 3.10.1959.  (vii) and (viii) N.A.  (ix) 19.3'.  (x) 5.3.1960.

2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 59(17) on page 584.

5. RESULTS:

(i) 3244 lb./ac.  (ii) 133.9 lb./ac.  (iii) Main effects of N and V are highly significant.  (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>Mean</th>
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<td>3756</td>
<td>3445</td>
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<td>2857</td>
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</tbody>
</table>

S.E. of N marginal mean = 29.9 lb./ac.
S.E. of V marginal mean = 47.3 lb./ac.
S.E. of body of table = 66.9 lb./ac.

Crop = Tobacco (Rabi).
Centre = Hajipur (Muzaffarpur, c.f.).
Object = To study the effect of A/S and mustard cake on different varieties of Tobacco.

BASAL CONDITIONS:

(i) (a) to (c) N.A.  (ii) Sandy loam.  (iii) Nil.  (iv) As per treatments.  (v) (a) 4 ploughings.  (b) Transplanting.  (c) 4 lb./ac.  (d) 3' X 2'.  (e) 1.  (vi) 3.10.1959.  (vii) to (ix) N.A.  (x) 5.3.1960.
2. TREATMENTS to 4. GENERAL:
Same as in expt. no. 59(17) on page 584.

5. RESULTS:
(i) 2329 lb./ac.  (ii) 169.1 lb./ac.  (iii) Main effects of N and V are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
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<td>2659</td>
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<td>2181</td>
<td>1976</td>
<td>2329</td>
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</tbody>
</table>

S.E. of N marginal mean = 37.8 lb./ac.
S.E. of V marginal mean = 59.1 lb./ac.
S.E. of body of table = 84.5 lb./ac.

Crop: Tobacco (Rabi).
Centre: Hajipur (Muzaffarpur, c.f.).
Object: To study the effect of A/S and mustard cake on different varieties of Tobacco.

Ref: C.T.R.I. 59(20).
Type: MV

1. BASAL CONDITIONS to 4. GENERAL:
Same as in expt. no. 59(17) on page 584.

5. RESULTS:
(i) 3364 lb./ac.  (ii) 110.7 lb./ac.  (iii) All effects of N and V are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
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</tbody>
</table>

S.E. of N marginal mean = 24.7 lb./ac.
S.E. of V marginal mean = 39.1 lb./ac.
S.E. of body of table = 55.3 lb./ac.

Crop: Tobacco (Rabi).
Centre: Hajipur (Muzaffarpur, c.f.).
Object: To study the effect of A/S and mustard cake on different varieties of Tobacco.

Ref: C.T.R.I. 59(21).
Type: MV

1. BASAL CONDITIONS to 4. GENERAL:
Same as in expt. no. 59(17) on page 584.

5. RESULTS:
(i) 3282 lb./ac.  (ii) 172.0 lb./ac.  (iii) All effects are highly significant. (iv) Av. yield of cured leaf in lb./ac.
Crop: Tobacco.  
Site: Wrapper and Hookah Tobacco Res. Sta., Dinahata.  
Object—To determine the optimum transplanting period for yield and quality of Motihari Tobacco.

1. Basal Conditions:
   (i) (a) Nil.  (b) Paddy.  (c) Top dressing with A/S at 1 ml./ac.  (ii) (a) Alluvium (Doran).  (b) N.A.  (iii) As per treatments.  (iv) (a) 8 ploughings and 8 plantings.  (b) Transplanting.  (c) 100% plants/ac.  (d) 2' x 2'.  (e) 1.  (f) G.M. with dhaincha+200 mds/ac. of F.Y.M.  (vi) Motihari (local).  (vii) Irrigated.  (viii) Interculturings, weeding, topping and suckerings.  (ix) 0.21'.  (x) 29.1.1955 to 11.3.1955.

2. Treatments:
   4 dates of transplanting:  

3. Design:
   (i) R.B.D.  (ii) 4.  (b) N.A.  (iii) 6.  (iv) (a) 51' x 24'.  (b) 48' x 20'.  (v) 2' x 2'.  (vi) Yes.

4. General:
   (i) Normal.  (ii) Nil.  (iii) Yield of tobacco.  (iv) (a) and (b) No.  (c) Nil.  (v) to (vii) Nil.

5. Results:
   (i) 65.6 lb./ac.  (ii) 79.3 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of tobacco in lb./ac.

   Treatment  
   T1  
   T2  
   T3  
   T4  

   Av. yield  
   718  
   567  
   809  
   529  

   S.E./mean = 32.4 lb./ac.

Crop: Tobacco.  
Site: Cigarette Tobacco Res. Sub-Sta. Farm, Guntur.  
Object—To find out whether harvest of Natu Tobacco in the flue-cured tobacco fashion i.e., priming and topping high would improve the crop.

1. Basal Conditions:
   (i) (a) Sorghum—Tobacco.  (b) Sorghum.  (c) Nil.  (ii) (a) Black clay.  (b) N.A.  (iii) 31.1.1954.  (iv) (a) 5 ploughings.  (b) and (c) N.A.  (d) 33' x 33'.  (e) N.A.  (v) 12 C.L./ac. of F.Y.M.  (vi) Natu—Tokaku.  (vii) Irrigated.  (viii) 2 intercultures and 2 weedings.  (ix) 7.65'.  (x) 31.1.1955 to 3.2.1955.

2. Treatments:
   All combinations of (1) and (2)
   (1) 2 methods of topping:  
   T1 = At 14 leaves and T2 = at flower head.
   (2) 2 methods of harvest:  
   T3 = From bottom to top at different intervals and T4 = From top to bottom all leaves at one time.
3. DESIGN:
(i) Fact. in R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 1/28.57 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of cured leaf. (iv) (a) and (b) N.A. (c) Nil. (v) to (viii) Nil.

5. RESULTS:
(i) 774 lb./ac. (ii) 68.61 lb./ac. (iii) Main effects of H and C are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>H1</th>
<th>H2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>712</td>
<td>636</td>
<td>674</td>
</tr>
<tr>
<td>933</td>
<td>814</td>
<td>874</td>
</tr>
</tbody>
</table>

Mean = 774 lb./ac.

S.E. of body of table = 28.0 lb./ac.

---

Crop - Tobacco.  
Site - Cigarette Tobacco Res. Sub-Stn. Farm Guntur.  
Type: - "C'.

Object: - To find out the optimal number of ploughings and harrowings required for Cigarette Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sorghum. (c) Nil. (d) (a) Black clay. (b) Nil. (iii) 16.10.1534. (iv) (a) As per treatments. (b) Transplanting. (c) N.A. (d) 33' x 33'. (e) N.A. (f) 20 lb./ac. of N as A/S. (g) Harrison special. (h) Unirrigated. (v) 3 weedings. (vi) 7.65'. (vii) 10.1.1955 to 15.2.1955.

2. TREATMENTS:
Main-plot treatments:
4 levels of ploughing: P1=3, P2=4, P3=5 and P4=6.

Sub-plot treatments:
4 levels of harrowing: H0=0, H1=1, H2=2 and H3=3.

3. DESIGN:
(i) Split-plot. (ii) 4 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/29.41 ac. (b) 1/40 ac. (v) One row alround. (vii) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Yield of green leaf, bright leaf and total bright leaf equivalent. (iv) (a) 1955-1956. (b) No. (c) Nil. (v) to (viii) Nil.

5. RESULTS:
(i) 3651 lb./ac. (ii) 631.9 lb./ac. (b) 427.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>3675</td>
<td>3647</td>
<td>3903</td>
<td>3488</td>
<td>3678</td>
</tr>
<tr>
<td>4001</td>
<td>3629</td>
<td>3946</td>
<td>3165</td>
<td>3685</td>
</tr>
<tr>
<td>3685</td>
<td>3436</td>
<td>3777</td>
<td>3379</td>
<td>3569</td>
</tr>
<tr>
<td>3912</td>
<td>3585</td>
<td>3826</td>
<td>3362</td>
<td>3671</td>
</tr>
</tbody>
</table>

Mean = 3818 lb./ac. 3874 lb./ac. 3863 lb./ac. 3349 lb./ac. 3651 lb./ac.
**Crop:** Tobacco  
**Site:** Tobacco Res. Sta., Hunsur  
**Ref:** C.T.R.L 57(14)  
**Type:** 'G'.

Object: To study the effect of piercing the stem at different levels of topping on the yield of Tobacco.

1. **BASAL CONDITIONS**:
   - (i) (a) Nil. (ii) (a) Red sandy loam. (b) N.A. (iii) 3rd week of Oct., 1957.  
   - (iv) (a) Ploughing 3 to 4 times. (b) Broadcasting.  
   - (c) 3 lb./ac.  
   - (d) 33 x 33.  
   - (e) N.A. (v) 60 lb./ac. of N+50 lb./ac. of P₂O₅+25 lb./ac. of K₂O. (vi) Chaurikudi. (vii) Unirrigated. (viii) As per treatments. (ix) N.A. (x) Last week of Jan., 1958.

2. **TREATMENTS**:
   - All combinations of (1) and (2).
     - (1) 3 levels of topping: T₁ = Topping at 10 leaves, T₂ = Topping at 12 leaves and T₃ = Topping at 14 leaves.
     - (2) 2 levels of piercing: P₀ = No piercing and P₁ = Piercing the stem.

3. **DESIGN**:
   - (i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 72 plants/plot. (v) Nil. (vi) Yes.

4. **GENERAL**:
   - (i) Satisfactory. (ii) Minor insects, controlled by spraying Bordeaux mixture. (iii) Yield of green leaf (with stem) and cured leaf (without stem) and no. of plants/plot.  
   - (iv) a) 1957—1961. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   - (i) 1440 lb./ac.  
   - (ii) 306.9 lb./ac.  
   - (iii) None of the effects is significant.  
   - (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>1337</td>
<td>1352</td>
<td>1425</td>
<td>1428</td>
</tr>
<tr>
<td>P₁</td>
<td>1482</td>
<td>1390</td>
<td>1460</td>
<td>1414</td>
</tr>
<tr>
<td>Mean</td>
<td>1409</td>
<td>1471</td>
<td>1442</td>
<td>1441</td>
</tr>
</tbody>
</table>

S.E. of T marginal mean = 108.5 lb./ac.  
S.E. of P marginal mean = 88.6 lb./ac.  
S.E. of body of table = 153.4 lb./ac.

**Crop:** Tobacco  
**Site:** Tobacco Res. Sta., Hunsur  
**Ref:** C.T.R.L 58(22).  
**Type:** 'G'.

Object: To study the effect of piercing the stem at different levels of topping on the yield of Tobacco.

1. **BASAL CONDITIONS**:
   - (i) (a) Nil. (b) Tobacco. (c) 60 lb./ac. of N+50 lb./ac. of P₂O₅+25 lb./ac. of K₂O. (ii) (a) Red sandy loam. (b) N.A. (iii) 5.10.1958. (iv) (a) Ploughing 3 to 4 times. (b) Broadcasting.  
   - (c) 3 lb./ac.  
   - (d) 33 x 33.  
   - (e) N.A. (v) 60 lb./ac. of N+50 lb./ac. of P₂O₅+25 lb./ac. of K₂O. (vi) Chaurikudi. (vii) Unirrigated. (viii) As per treatments. (ix) 7.46°. (x) 27.2.1959.
2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 57(14) on page 589.

5. RESULTS:
(i) 447 lb./ac.  (ii) 96.6 lb./ac.  (iii) Main effect of T alone is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>373</td>
<td>473</td>
<td>475</td>
<td>440</td>
</tr>
<tr>
<td>P₁</td>
<td>364</td>
<td>444</td>
<td>553</td>
<td>454</td>
</tr>
</tbody>
</table>

Mean 368 458 514 447

S.E. of T marginal mean = 34.1 lb./ac.  
S.E. of P marginal mean = 27.9 lb./ac.  
S.E. of body of table = 48.3 lb./ac.

Crop : Tobacco.  
Site : Tobacco Res. Sta., Hunsur.  
Ref : C.T.R.L. 59(22).  
Type : 'C'.

Object :—To study the effect of piercing the stem at different levels of topping on the yield of Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Tobacco.  (c) 60 lb./ac. of N+5 lb./ac. of P₂O₅+25 lb./ac. of K₂O. (ii) (a) Red sandy loam.  
(b) N.A.  (iii) 27.10.1959 (iv) (a) Ploughing 3 to 4 times.  (b) Broadcasting.  (c) 3 lb./ac.  (d) 33°x33°  
(e) N.A.  (v) 60 lb./ac. of N+50 lb./ac. P₂O₅+24 lb./ac. of K₂O.  (vi) Chaurikudi. (vii) Unirrigated. (viii) As per treatments.  (ix) 10.4.  
(x) 31.1.1960.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 57(14) on page 589.

5. RESULTS:
(i) 985 lb./ac.  (ii) 165.3 lb./ac.  (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>970</td>
<td>1071</td>
<td>913</td>
<td>985</td>
</tr>
<tr>
<td>P₁</td>
<td>917</td>
<td>1027</td>
<td>1010</td>
<td>985</td>
</tr>
</tbody>
</table>

Mean 944 1049 962 985

S.E. of T marginal mean = 58.4 lb./ac.  
S.E. of P marginal mean = 47.7 lb./ac.  
S.E. of body of table = 82.6 lb./ac.

Crop : Tobacco.  
Site : Tobacco Res. Sta., Hunsur.  
Type : 'C'.

Object :—To study the effect of shearing the stem on the yield of Tobacco.

1. BASAL CONDITIONS:
(a) (a) Rari to Kharif and Tobacco in Rabi.  (b) Rabi.  (c) 20 lb./ac. of N. (d) (a) Red sandy loam.  
(b) N.A.  (iii) 10.10.1957 (iv) (a) Ploughing 3 to 4 times.  (b) Transplanting.  (c) 3 lb./ac.  (d) 33°x33°  
(e) N.A.  (v) 50 lb./ac. of N+50 lb./ac. P₂O₅+25 lb./ac. of K₂O applied as 4 (25+25+N.C. Super and Potash respectively. (vi) Chaurikudi. (vii) Unirrigated. (viii) Intercropping, topping and suckering. (ix) N.A.  
(x) 20.2.1958.
2. **TREATMENTS**:

2 cultural treatments: $C_1$ = Planting seedlings from nursery without shade and $C_2$ = Planting seedlings from shaded nursery.

3. **DESIGN**:

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 200 plants/plot. (v) Nil. (vi) Yes.

4. **GENERAL**:

(i) Fair. (ii) Nil. (iii) Yield of green leaf with stem and cured leaf without stem. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:

(i) 690 lb./ac. (ii) 74.7 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$C_1$</th>
<th>$C_2$</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>757</td>
<td>623</td>
<td>37.3 lb./ac.</td>
</tr>
</tbody>
</table>

---

**Crop:** Tobacco.  
**Site:** Tobacco Res. Stn., Hunsur.  
**Type:** 'C'.

Object: To study the effect of shading the nursery on the yield of Tobacco.

1. **BASAL CONDITIONS**:

(i) (a) Ragi in mask and Tobacco in robi. (b) Ragi. (c) 20 lb./ac. of N. (ii) (a) Red sandy loam. (b) N.A. (iii) 29-10-1958. (iv) (a) Ploughing 3 to 4 times. (b) Transplanting. (c) 3 lb./ac. (d) 33$^\circ$, 33$^\circ$. (e) N.A. (v) 80 lb./ac. of N+50 lb./ac. of $K_2O+25$ lb./ac. of $P_2O_5$ applied as A/S+G.N.C., Super and Potash respectively. (vi) Chautikudi. (vii) Unirrigated. (viii) Inter-cultivation, topping and suckering. (ix) 7.46". (x) 22.2.1959.

2. **TREATMENTS**:

Same as in exp. no. 57(15) on page 590.

3. **DESIGN**:

(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 96 plants/plot. (v) Nil. (vi) Yes.

4. **GENERAL**:

(i) Sub-normal. (ii) Nil. (iii) Yield of green leaf with stem and cured leaf without stem and no. of plants/plot. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Leveling of field could be completed very late and planting was completed by 14.11.1958. Due to lack of soil moisture crop was sub-normal.

5. **RESULTS**:

(i) 505 lb./ac. (ii) 104.8 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$C_1$</th>
<th>$C_2$</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>472</td>
<td>538</td>
<td>52.4 lb./ac.</td>
</tr>
</tbody>
</table>

---

**Crop:** Tobacco.  
**Site:** Tobacco Res. Stn., Hunsur.  
**Type:** 'C'.

Object: To study the effect of shading the nursery on the yield of Tobacco.
1. BASAL CONDITIONS:
   (i) (a) Ragi in kharif and Tobacco in rabi. (b) Ragi. (c) 20 lb./ac. of N. (d) (a) Red sandy loam. (b) N.A. (iii) 26/10/1959. (iv) (a) Ploughing 3 to 4 times. (b) Transplanting. (c) 3 lb./ac. (d) 33" x 33". (e) N.A. (v) 80 lb./ac. of P2O5 and 25 lb./ac. of K2O applied as A/S+G.N.C. Super and Potash respectively. (vi) Chautikudi. (vii) Unirrigated. (viii) Inter cultivation, topping and sucker ing. (ix) 10.45. (x) 31.1.1960.

2. TREATMENTS:
   Same as in exp. no. 57(15) on page 590.

3. DESIGN:
   (i) R.B.D. (ii) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 120 plants/plot. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Yield of green leaf (with stem) and cured leaf (without stem) and no. of plants/plot. (iv) (a) 1957-1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1063 lb./ac. (ii) 141.8 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of cured leaf in lb./ac. Treatment \( C_1 \) \( C_2 \)
   \[
   \text{Av. yield} = 1058 \quad 1069
   \]
   S.E./mean \( = 70.5 \) lb./ac.

---

**Crop**: Tobacco (*Kharif*).

**Site**: Tobacco Res. Stn., Hunsur.

**Ref**: C.T.R.I 57(16).

**Type**: 'C'.

Object: To find the effect of shading the nursery on the number of the transplanting seedlings.

1. BASAL CONDITIONS:
   (i) (a) and (b) Nil. (c) N.A. (ii) (a) Red sandy loam. (b) N.A. (iii) 24.7.1957. (iv) (a) Ploughing 3 to 4 times. (b) Broadcasting. (c) 3 lb./ac. (d) 33" x 33". (e) N.A. (v) Nil. (vi) Chautikudi. (vii) Unirrigated. (viii) Nil. (ix) Nil. (x) 19.9.1957 to 19.10.1957.

2. TREATMENTS:
   2 cultural treatments: \( C_0 \) = No shading and \( C_1 \) = Shading the nursery.

3. DESIGN:
   (i) R.B.D. (ii) 2. (b) N.A. (iii) 7. (iv) (a) and (b) Y x 4' of the bed. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) % of transplantable seedlings per bed. (iv) (a) 1957-1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Considerable washing off due to beating rains on 29.7.1957. (vii) Nil.

5. RESULTS:
   (i) 237 seedlings/bed. (ii) 48 seedlings/bed. (iii) Treatment difference is significant. (iv) Av. no. of transplantable seedlings/bed. Treatment \( C_0 \) \( C_1 \)
   \[
   \text{Av. yield} = 279 \quad 129
   \]
   S.E./mean \( = 18 \) seedlings/bed.
Crop: Tobacco (Kharif),

Site: Tobacco Res. Sta., Hunsur.

Object: To study the effect of shading the nursery on the number of transplantable seedlings.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) Nil. (ii) (a) Red sandy loam. (b) Nil. (iii) 8.4.1958. (iv) (a) Ploughing 3 to 4 times. (b) Broadcasting. (c) 3 lb./ac. (d) 33" x 33". (e) N.A. (v) Nil. (vi) Chaurikudi. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 5 to 17.10.1958.

2. TREATMENTS:
   Same as in exp. no. 57(6) on page 592.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 20' x 4' of the bed. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Damping in the form of wet rot and leaf spot due to anthracnose within 3 to 4 weeks respectively after sowing and appropriate spray of Bordeaux mixture adopted to control the disease. (iii) % of transplantable seedlings per bed. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 47.6%. (ii) 0.33%. (iii) Treatment difference is not significant. (iv) Av. % of transplantable seedlings.

   Treatment   C₀   C₁
   Av. %     43.9   51.3
   S.E./mean = 0.16 %.

---

Crop: Tobacco (Kharif),

Site: Tobacco Res. Sta., Hunsur.

Object: To study the effect of shading of nursery on the number of transplantable seedlings.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) Nil. (ii) (a) Red sandy loam. (b) Nil. (iii) 20.7.1959. (iv) (a) Ploughing 3 to 4 times. (b) Broadcasting. (c) 3 lb./ac. (d) 33" x 33". (e) N.A. (v) Nil. (vi) Chaurikudi. (vii) Unirrigated. (viii) Nil. (ix) 3 to 23.9.1959.

2. TREATMENTS:
   Same as in exp. no. 57(16) on page 592.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) and (b) 10' x 4' of the bed. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Heavy rainfall affected the growth of seedlings adversely. (ii) Anthracnose spread very rapidly affecting the seedling stand and it was controlled by spraying Bordeaux mixture. (iii) % of transplantable seedlings. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 61.7%. (ii) 1.2%. (iii) Treatment difference is highly significant. (iv) Av. % of transplantable seedlings.

   Treatment   C₀   C₁
   Av. yield  52.1   70.8
   S.E./mean = 0.42%.
Crop: Tobacco  
Site: Tobacco Res. Sta., Hunsur. 
Ref: C.T.R.I. 57(17), Type = 'C'. 

Object: To find the optimum seed rate to raise healthy seedlings of flue cured Tobacco in nursery.

I. BASAL CONDITIONS:
(i) (a) and (b) Nil. (c) N.A. (ii) (a) Red sandy loam. (b) Nil. (iii) 24.2.1957. (iv) (a) Ploughing 3 to 4 times. (b) Broadcasting. (c) As per treatments. (d) and (e) N.A. (v) 20 tons/ac of FYM applied before sowing and 50 lb/ac of N as A/S applied as top dressing. (vi) Harrison special. (vii) Unirrigated. (viii) Nil. (ix) 8 to 30.9.1957.

2. TREATMENTS:
5 seed rates: R1 = 0.75, R2 = 1.50, R3 = 3.00, R4 = 4.50 and R5 = 6.00 lb/ac.

3. DESIGN:
(i) R.B.D. (ii) 5. (b) 4 x 23.75'. (iii) 4. (iv) (a) and (b) 4 x 4.75'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Not satisfactory. (ii) Minor insects were controlled by spraying Bordeaux mixture 0.4% at weekly intervals. (iii) % of transplantable seedlings and germination counts. (iv) 1957-1960. (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) Considerable washing off due to beating rains on 29.7.1957. (vii) Nil.

5. RESULTS:
(i) 79.3%. (ii) 0.56%. (iii) Treatment differences are significant. (iv) Av. % of transplantable seedlings.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. %</td>
<td>76.6</td>
<td>84.3</td>
<td>85.9</td>
<td>75.9</td>
<td>71.6</td>
<td>0.28%</td>
</tr>
</tbody>
</table>

Crop: Tobacco  
Site: Tobacco Res. Sta., Hunsur. 
Ref: C.T.R.I. 58(25), Type = 'C'. 

Object: To find out the optimum seed rate to raise healthy seedlings of flue cured Tobacco in nursery.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Tobacco. (c) 20 tons/ac of FYM. applied before sowing and 50 lb/ac of N as A/S applied as top dressing. (ii) (a) Red sandy loam. (b) N.A. (iii) 28.5.1958. (iv) (a) Ploughing 3 to 4 times. (b) Broadcasting. (c) As per treatments. (d) and (e) N.A. (v) 20 tons/ac of FYM. applied before sowing and 50 lb/ac. of N as A/S at top dressing. (vi) Harrison special. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 31.7.1958 to 20.8.1958.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 57(17) above.

4. GENERAL:
(i) Due to lack of rains germination was poor. (ii) No serious pests and diseases and minor insects were controlled by spraying Bordeaux mixture at weekly intervals. (iii) % of transplantable seedlings and germination counts. (iv) 1957-1960. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 65.7 %. (ii) 1.8 %. (iii) Treatment differences are highly significant. (iv) Av. % of transplantable seedlings.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. %</td>
<td>89.2</td>
<td>65.3</td>
<td>58.5</td>
<td>57.7</td>
<td>53.3</td>
</tr>
</tbody>
</table>

S.E./mean = 0.9%
Crop: Tobacco (Kharif).  
Site: Tobacco Res. Sta., Hissar.  
Type: C.T.R.I. 59(26).

Object:—To find out the optimum seed rate to raise healthy seedlings of fly cured Tobacco in nursery.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Tobacco.  (c) 8 tons/ac. of F.Y.M. applied before sowing and 50 lb./ac. of N as A/S given as top dressing.  (ii) (a) Red sandy loam.  (b) N.A.  (iii) 27.5.1959.  (iv) (a) Ploughing 3 to 4 times.  (b) Broadcasting.  (c) As per treatments.  (d) and (e) N.A.  (v) 8 tons/ac. of F.Y.M. applied before sowing and 50 lb./ac. of N as A/S given as top dressing.  (vi) Harriss special.  (vii) Unirrigated.  (viii) Nil.  (ix) 21.9°.  (x) 30.7.1959 to 30.8.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 57(17) on page 594.

4. GENERAL:
   (i) Fair.  (ii) Anthracnose spread very rapidly affecting the seedling stand; controlled by spraying Bordeaux mixture (0.4 %) at weekly intervals.  (iii) % of transplantable seedlings and germination count.  (iv) (a) 1957—1960.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) Due to heavy rains the seedlings were washed and it was resown.  (vii) Nil.

5. RESULTS:
   (i) 78.8 %.  (ii) (a) 0.70 %.  (b) 0.18 %.  (iii) Treatment differences are highly significant.  (iv) Av. % of transplantable seedlings.

   Treatment
<table>
<thead>
<tr>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
</tr>
</thead>
<tbody>
<tr>
<td>78.8</td>
<td>65.6</td>
<td>57.9</td>
<td>53 I</td>
<td>36.6</td>
</tr>
</tbody>
</table>

   S.E./mean = 0.35 %.

Crop: Tobacco.  
Ref: C.T.R.I. 54(34).

Site: Hookah and Chewing Tobacco Res. Sta., Pusa.  
Type: C.T.R.I. 54(34).

Object:—To find out the effect of rabbng and shading of nursery on growth of seedlings and yield of transplanted crop of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—Maize+Rahar.  (b) Maize+Rahar.  (c) Nil.  (ii) (a) Gangetic alluvium calcareous.  (b) N.A.  (iii) N.A.  (iv) 20.9.1954.  (v) (a) to (c) N.A.  (d) 3'x2'.  (e) I.  (f) G.M. with sahempoa.  (g) Bari bharao—93.  (h) Irrigated.  (i) Interseeding once, weeding twice, topping once as usual and suckermg 8 times.  (j) 46.73°.  (k) 23.2.1955.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 treatments of rabbng: R0-Unrabbded and R1=Rabbded.
   (2) 2 treatments of shading: S0-Unshaded and S1=Shaded.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) 42°x21°.  (b) 38°x15°.  (v) 2'x3'.  (vi) Yes.

4. GENERAL:
   (i) Av. growth and stand.  (ii) Leaf curl, mosaic, attack of cutworm, caterpillars. Hand picking of larvae.  (iii) No. of transplantable seedlings per bed, weight per seedlings in oz. Cured leaf weight.  (iv) (a) 1954—1956.  (b) No.  (c) Nil.  (v) to (vi) Nil.

5. RESULTS:
   (i) 1913 lb./ac.  (ii) 124.6 lb./ac.  (iii) None of the effects is significant.  (iv) Av. yield of cured leaf in lb./ac.
Crop: Tobacco (Rabi)


Site: Hookah and Chewing Tobacco Res. Sta., Pusa. Type: C.

Object: To determine the effect of rabbing and shading on growth of seedlings and yield of transplanted crop of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
   (a) Maize + Rabi + Tobacco. (b) Maize + Rabi. (c) Nil. (d) Ganges alluvium calcareous. (e) Transplanting. (f) Nil. (g) 1 lb. (h) 3'x2'. (i) Nil. (j) No. (k) Nil. (l) 1 ploughing by planet junior cultivator. (m) Transplantation. (n) Nil. (o) 1 ploughing by planet junior cultivator. (p) Nil. (q) 3'x2'. (r) NIL. (s) 2 lb. (t) 5'x5'. (u) Nil. (v) Nil. (w) 3'x2'. (x) Nil. (y) 2 lb. (z) 1.3.1957.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(34) on page 595.

4. GENERAL:
   (i) Average growth. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 15.6 lb./ac. (b) Nil. (c) Nil. (d) NIL. (e) Nil. (f) Nil. (g) Nil. (h) Nil. (i) Nil. (j) Nil. (k) Nil. (l) Nil. (m) Nil. (n) Nil. (o) Nil. (p) Nil. (q) Nil. (r) Nil. (s) Nil. (t) Nil. (u) NIL. (v) Nil. (w) Nil. (x) Nil. (y) Nil. (z) Nil.

5. RESULTS:
   (i) 197 lb./ac. (ii) 194 lb./ac. (iii) 192 lb./ac.

S.E. of any marginal mean = 36.0 lb./ac.
S.E. of body of table = 61.1 lb./ac.

Crop: Tobacco (Rabi)


Site: Hookah and Chewing Tobacco Res. Sta., Pusa. Type: C.

Object: To determine the effect of rabbing and shading on the growth of seedlings and yield of transplanted crop of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
   (a) Maize + Rabi + Tobacco. (b) Maize + Rabi. (c) Nil. (d) Gangetic alluvium calcareous. (e) Transplanting. (f) Nil. (g) 1 lb. (h) 3'x2'. (i) Nil. (j) G.M. with sannhemp. (k) V.B. with irrigating. (l) Weeding and hoeing, suckerings and topping. (m) 5.11. (n) 1.3.1957.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 54(34) on page 595.

4. GENERAL:
   (i) Average growth. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 15.6 lb./ac. (b) NIL. (c) Nil. (d) NIL. (e) Nil. (f) Nil. (g) Nil. (h) Nil. (i) Nil. (j) Nil. (k) Nil. (l) Nil. (m) NIL. (n) Nil. (o) Nil. (p) Nil. (q) NIL. (r) Nil. (s) NIL. (t) Nil. (u) NIL. (v) Nil. (w) Nil. (x) NIL. (y) Nil. (z) NIL.

5. RESULTS:
   (i) 197 lb./ac. (ii) 194 lb./ac. (iii) 192 lb./ac.

S.E. of any marginal mean = 36.0 lb./ac. 
S.E. of body of table = 61.1 lb./ac.
2. TREATMENTS:
Same as in expt. no. 54(34) on page 596.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 15' x 30'. (b) 9' x 26'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of cutworm, leaf eating caterpillar; 50% D.D.T. was sprayed, leaf curl and mosaic attack. (iii) Yield of cured leaf. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Hail storm on 9.1.1957. (vii) Nil.

5. RESULTS:
(i) 1381 lb./ac. (ii) 185.3 lb./ac. (iii) Only S effect is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R₂</th>
<th>R₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₀</td>
<td>1534</td>
<td>1438</td>
<td>1486</td>
</tr>
<tr>
<td>S₁</td>
<td>1238</td>
<td>1312</td>
<td>1275</td>
</tr>
<tr>
<td>Mean</td>
<td>1386</td>
<td>1375</td>
<td>1381</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 58.6 lb./ac.
S.E. of body of table = 87.9 lb./ac.

Crop: Tobacco
Site: Hookah and Chewing Tobacco Res. Stn., Pusa.
Object: To determine the amount of seed required for one acre of nursery of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
(i) Tobacco—Maize + Rahar mixture. (b) Maize + Rahar mixture. (c) Nil. (d) (a) Gangetic alluvium calcareous. (b) N.A. (ii) N.A./29.9.1954. (iv) (a) and (b) N.A. (c) As per treatments. (d) 3' x 2'. (e) I. (v) G.M. with sunn hemp. (vii) Bori bharao—93 (medium). (vii) Irrigated. (viii) Inter culturing twice, weeding twice, topping once as usual and suckering seven times. (ix) 46.7". (X) 6.3.1955.

2. TREATMENTS:
3 seed rates: R₂ = 7, R₃ = 4 and R₄ = 6 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 42" x 29". (b) 36" x 16". (v) 3' x 2'. (vi) Yes.

4. GENERAL:
(i) Av. growth and stand. (ii) Leaf curl, mosaic, attack of cut worm and caterpillar. Hand picking of larvae. (iii) No. of seedlings, weight of seedlings and yield of cured tobacco. (iv) (a) 1954—1956. (b) and (c) No. (v) to (vii) Nil.

5. RESULTS:
(i) 2181 lb./ac. (ii) 128.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2174</td>
<td>2130</td>
<td>2218</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 52.4 lb./ac.
Crop: Tobacco (Rabi).

Site: Hookah and Chewing Tobacco Res. Sta., Pusa.

Type: 'C'.

Object: To determine the amount of seed required for one acre of nursery of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Maize+Rahar—Tobacco. (b) Maize+Rahar. (c) Nil. (ii) (a) Gangetic alluvium calcareous. (b) N.A. (iii) 4.10.1955. (iv) (a) 1 ploughing by planet junior cultivator. (b) Transplanting. (c) As per treatments. (d) 3'×2'. (e) 1. (v) G.M. with santhemp. (vi) Bari bharao—93 (medium). (vii) Irrigated. (viii) 3 weedings and mulching, 7 suckering and topping. (ix) 6.11°. (x) 11.3.1956.

2. TREATMENTS:
   Same as in expt. no. 54(35) on page 597.

3. DESIGN:
   (i) R.B.D. (ii) 3. (b) N.A. (iii) 6. (iv) (a) 21'×42'. (b) 15'×38'. (v) 3'×2'. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1573 lb./ac. (ii) 132.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

   Treatment     R1         R2         R3
   Av. yield     1473        1636        1610
   S.E./mean   = 54.1 lb./ac.

---

Crop: Tobacco (Rabi).

Site: Hookah and Chewing Tobacco Res. Sta., Pusa.

Type: 'C'.

Object: To determine the amount of seed required for one acre of nursery of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
   (i) Maize+Rahar—Tobacco. (b) Maize+Rahar. (c) Nil. (ii) (a) Gangetic alluvium calcareous. (b) N.A. (iii) 2.10.1955. (iv) (a) 1 ploughing with plant junior cultivator. (b) Transplanting. (c) As per treatments. (d) 3'×2'. (e) 1. (v) G.M. with santhemp. (vi) Bari bharao—93 (medium). (vii) Irrigated. (viii) 4 weedings, mulching, suckering 5 times and topping. (ix) 14.00°. (x) 21.2.1957.

2. TREATMENTS:
   Same as in expt. no. 54(35) on page 597.

3. DESIGN:
   (i) R.B.D. (ii) 3. (b) N.A. (iii) 6. (iv) (a) 15'×30'. (b) 9'×25'. (v) 3'×2'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Aphid attack. Spraying of Endrin 19.5% E.C. twice. (iii) Yield of cured leaf. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Heavy rain during nursery season. Hail strom on 9.1.1957.

5. RESULTS:
   (i) 1324 lb./ac. (ii) 132.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.
Crop: Tobacco (Rabi).  
Site: Hookah and Chewing Tobacco Res. Sta., Pusa.  
Type: C'.

Object: To study the effect of mixed cropping with shallow-rooted crops on the yield and quality of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) G.M. crop sanhemp.  (c) N.A.  (ii) (a) Indo-gangetic alluvium calcareus.  (b) N.A.  (iii) 9.10.1958.  (iv) (a) 4 ploughings.  (b) Transplanting.  (c) 4 lb./ac.  (d) 3' x 2'.  (e) 1.  (v) G.M. with sanhemp.  (vi) D.P. = 401.  (vii) Irrigated.  (viii) 2 weedings, topping and suckering.  (ix) 7.4'.  (x) 8.3.1959.

2. TREATMENTS:
4 crops sown with tobacco: C₄ = Control, C₁ = Garlic, C₂ = Onion and C₃ = Coriander.

3. DESIGN:
(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) 15' x 30'.  (b) 9' x 26'.  (v) 3' x 2'.  (vi) Yes.

4. GENERAL:
(i) Good.  (ii) Leaf curl and mosaic.  (iii) Cured leaf yield.  (iv) (a) 1958−1960.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
(i) 2547 lb./ac.  (ii) 265.6 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₀</th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2541</td>
<td>2641</td>
<td>2392</td>
<td>2612</td>
</tr>
</tbody>
</table>

S.E./mean = 116.6 lb./ac.

---

Crop: Tobacco (Rabi).  
Site: Hookah and Chewing Tobacco Res. Sta., Pusa.  
Type: C'.

Object: To study the effect of mixed cropping with shallow-rooted crops on the yield and quality of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) G.M. crop sanhemp.  (c) Nil.  (ii) (a) Indo-gangetic alluvium calcareous.  (b) N.A.  (iii) 21.10.1959.  (iv) (a) 4 ploughings.  (b) Transplanting.  (c) 4 lb./ac.  (d) 3' x 2'.  (e) 1.  (v) G.M. with sanhemp.  (vi) D.P. = 401.  (vii) Irrigated.  (viii) 3 weedings, topping and suckering.  (ix) 19.6'.  (x) 1.4.1960.

2. TREATMENTS:
Same as in exp. no. 58(26) above.

3. DESIGN:
(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) 15' x 30'.  (b) 9' x 26'.  (v) Yes.

4. GENERAL:
(i) Good.  (ii) Leaf curl and mosaic.  (iii) Cured leaf yield.  (iv) (a) 1958−1960.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
(i) 1635 lb./ac.  (ii) 210.1 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of cured leaf in lb./ac.
Object: To study the effect of different spacings on the yield of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) N.A./28.9.1957. (iv) (a) 5 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) As per treatments. (e) 1. (v) G.M. with sawahemp. (vi) N.P.—220. (vii) Irrigated. (viii) 2 weedings, topping and suckering. (ix) 49.3'. (x) 5.2.1958.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 2 spacings between rows: \( R_1 = 18'' \) and \( R_2 = 24'' \).
   (2) 2 spacings between plants: \( S_1 = 12'' \) and \( S_2 = 18'' \).

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) \( 12' \times 21' \). (b) Varying as per treatments. (v) 1 row around. (vi) Yes.

4. GENERAL:
   (i) Water lodged. (ii) Leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1957—1958. (b) No. (c) N.A. (d) Nil. (e) to (vii) Nil. (viii) 1.1•. (ix) 20.2.1959.

5. RESULTS:
   (i) 2364 lb./ac. (ii) 520.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( R_1 )</th>
<th>( R_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>2496</td>
<td>2234</td>
<td>2365</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>2412</td>
<td>2142</td>
<td>2363</td>
</tr>
<tr>
<td>Mean</td>
<td>2354</td>
<td>2274</td>
<td>2364</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 184.1 lb./ac.
S.E. of body of table = 260.4 lb./ac.
3. DESIGN:
(i) Fact. in R.B.D.  (ii) 6  (b) N.A.  (iii) 6.  (iv) (a) 12' × 21'  (b) Varying as per treatments.  (v) 1 row around.  (vi) Yes.

4. GENERAL:
Same as in exp. no. 57(23) on page 60/0.

5. RESULTS:
(i) 1861 lb./ac.  (ii) 312.3 lb./ac.  (iii) None of the effects is significant.  (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1852</td>
<td>2066</td>
<td>1949</td>
</tr>
<tr>
<td>S2</td>
<td>1863</td>
<td>1682</td>
<td>1772</td>
</tr>
<tr>
<td>Mean</td>
<td>1857</td>
<td>1864</td>
<td>1860</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 90.1 lb./ac.
S.E. of body of table = 127.5 lb./ac.

Crop: Tobacco.
Ref: C.T.R.I. 54(39).
Site: Central Tobacco Res. Instt., Rajahmundry. Type: ‘C’.
Object: To find out the effect of different spacings on the yield of Tobacco.

1. BASAL CONDITIONS:
(i) (a) Continuous tobacco.  (b) Tobacco.  (c) Nil.  (ii) (a) Deep black soil.  (b) N.A.  (iii) N.A. 20.10.1951.
(iv) (a) 4 ploughings with country plough.  (b) Transplanting.  (c) N.A.  (d) As per treatments.  (e) 1.  (v) 20 lb./ac. of N as A/S broadcast.  (vi) Chatham (cigarette).  (vii) Unirrigated.  (viii) 2 intercultures with planet junior and 2 hand weedings.  (ix) 6.21'.  (x) 1.9.1953 to 22.2.1955.

2. TREATMENTS:
5 spacings: S1=33' × 33' (control : 2 plots), S2=48' × 12', S3=48' × 15', S4=45' × 15' and S5=48' × 21'.

3. DESIGN:
(i) R.B.D.  (ii) 6  (b) N.A.  (iii) 6.  (iv) (a) 22' × 33' for S2 and 24' × 33' for rest.  (b) Varying sizes with 1 row omitted all round each plot.  (v) 1 row all round each plot.  (vi) Yes.

4. GENERAL:
(i) Normal.  (ii) Nil.  (iii) Weight of green, cured leaves and the proportion of different grades of cured leaf, dry weight of seed capsules and stalk.  (iv) (a) and (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
Bright leaf
(i) 586 lb./ac.  (ii) 75.4 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of bright leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>S6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>592</td>
<td>586</td>
<td>576</td>
<td>608</td>
<td>566</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of S1 mean = 21.9 lb./ac.
S.E. of mean other than S1 = 30.8 lb./ac.

Green leaf
(i) 6192 lb./ac.  (ii) 565 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of green leaf in lb./ac.
Crop: Tobacco (Rabi).
Ref: C.T.R.I. 56(12).
Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'C'.

Object: To study the effect of different spacings on the yield of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) N.A./22.11.1956. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) As per treatments. (e) I. (v) Nil. (vi) Harrison special (medium cigarette). (vii) Unirrigated. (viii) 2 intercultures—1 with teeth harrow and 1 with planet junior hoe and 2 hand weeding. (ix) Nil. (x) 25.1.1957 to 15.3.1957.

2. TREATMENTS:
   3 spacings: $S_1 = 33'' \times 33''$, $S_2 = 48'' \times 24''$ and $S_3 = 48'' \times 18''$.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 48''0''x413''. (b) $S_2 = 413'' \times 359''$, $S_3 = 44''0'' \times 32''0''$ and $S_3 = 453'' \times 32''0''$ for 3 replications and $S_2 = 413'' \times 359''$, $S_3 = 40''0'' \times 36''0''$ and $S_1 = 40''0'' \times 37''6''$ for other 3 replications. (v) N.A. (vi) Yes

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1953—1957 (modified in 1955). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 622 lb./ac. (ii) 34.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

   Treatment    $S_1$    $S_2$    $S_3$
   Av. yield    6220    6049    6418

   S.E./mean   =   139.3 lb./ac.

---

Crop: Tobacco (Rabi)
Ref: C.T.R.I. 57(18).
Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'C'.

Object: To study the effect of different spacings on the yield of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) 20 lb./ac. of N as A/S. (ii) (a) Heavy black soil. (b) N.A. (iii) N.A./19.10.1957. (iv) (a) 1 ploughing with country plough. (b) Planting with rope. (c) N.A. (d) As per treatments. (e) I. (v) 100 lb./ac. of A/S to supply 20 lb./ac. of N applied deep in the plough furrow during October. (vi) Harrison special (medium flue cured). (vii) Unirrigated. (viii) 2 intercultures with planet junior hoe and 1 hand weeding. (ix) 2.56''. (x) 27.12.1957 to 10.2.1958.

2. TREATMENTS:
   Same as in expt. no. 56(12) above.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 413''\times 48''. (b) 1/100 ac. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Slight incidence of mosaic. Care was taken not to touch the affected plants. Spraying of DDT at 2 ccs./10 gallons of water was done for caterpillar incidence. (iii) Yield of green leaf. (iv) (a) 1953–1957. (b) No: (c) Nil. (v) All (vii) Nil.

5. RESULTS:
(i) 6870 lb./ac. (ii) 478.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

Treatment

<table>
<thead>
<tr>
<th>S&lt;sub&gt;1&lt;/sub&gt;</th>
<th>S&lt;sub&gt;2&lt;/sub&gt;</th>
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</tr>
</thead>
<tbody>
<tr>
<td>6854</td>
<td>6720</td>
<td>7035</td>
</tr>
</tbody>
</table>

Av. yield 6753 6788 7008 7262 6945 6773 7229 6737 6817

S.E./mean = 217.4 lb./ac.

Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Inst., Rajahmundry. Type: GC.
Object: To find out the optimum combination of ploughing (with iron and wooden plough) combined with harrowing, required for cigarette Tobacco.

1. BASAL CONDITIONS:
(i) (a) Continuous tobacco. (b) Tobacco. (c) 20 lb./ac. of N as A/S. (ii) (a) Deep black soil. (b) N.A. (iii) N.A./28.10.1957. (iv) (a) As per treatments. (b) Transplanting. (c) N.A. (d) 33'-33'. (e) 1. (f) 20 lb./ac. of N as A/S deep behind the country plough in furrows opened twice with ridge during last week of October. (vi) Harrison special (medium). (vii) Unirrigated. (viii) 2 intercultures with plane/Juno hoe both ways and 2 hand weeding. (ix) 1.18°. (x) 9.1.1958 to 17.2.1958.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Implement</th>
<th>T&lt;sub&gt;1&lt;/sub&gt;</th>
<th>T&lt;sub&gt;2&lt;/sub&gt;</th>
<th>T&lt;sub&gt;3&lt;/sub&gt;</th>
<th>T&lt;sub&gt;4&lt;/sub&gt;</th>
<th>T&lt;sub&gt;5&lt;/sub&gt;</th>
<th>T&lt;sub&gt;6&lt;/sub&gt;</th>
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<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Country plough</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Blade harrow</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 49'6"×27'6". (b) 44'0"×22'0". (vi) 21'×21'. (v) Yes.

4. GENERAL:
(i) Normal. (ii) Slight incidence of mosaic. Care was taken not to touch the affected plants. Spraying of DDT at 2 ccs./10 gallons of water was done for caterpillar incidence. (iii) Yield of green leaf. (iv) (a) 1957–1958. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 6866 lb./ac. (ii) 434.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

Treatment

<table>
<thead>
<tr>
<th>T&lt;sub&gt;1&lt;/sub&gt;</th>
<th>T&lt;sub&gt;2&lt;/sub&gt;</th>
<th>T&lt;sub&gt;3&lt;/sub&gt;</th>
<th>T&lt;sub&gt;4&lt;/sub&gt;</th>
<th>T&lt;sub&gt;5&lt;/sub&gt;</th>
<th>T&lt;sub&gt;6&lt;/sub&gt;</th>
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<td>7008</td>
<td>7262</td>
<td>6945</td>
<td>6773</td>
<td>7229</td>
</tr>
</tbody>
</table>

Av. yield 6753 6788 7008 7262 6945 6773 7229 6737 6817

S.E./mean = 217.4 lb./ac.

Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Inst., Rajahmundry. Type: GC.
Object: To find out the optimum combination of ploughing (with iron and wooden plough) combined with harrowing, required for cigarette Tobacco.
1. **BASAL CONDITIONS**:
   (i) Continuous tobacco.  
   (b) Tobacco.  
   (c) 20 lb./ac. of N as A/S.  
   (ii) (a) Deep black soil.  
   (b) N.A.  
   (iii) N.A./13.11.1958.  
   (iv) (a) As per treatments.  
   (b) Transplanted.  
   (c) N.A.  
   (d) 33'x33'.  
   (e) 1.  
   (f) 7 tons/ac. of F.Y.M. applied by broadcast.  
   (g) 20 lb./ac. of N as A/S by working a deep placing implement.  
   (h) Harrison special (medium).  
   (i) Unirrigated.  
   (j) 3 tons/ac. of F.Y.M. applied by broadcast.  
   (k) 20 lb./ac. of N as A/S by working a deep placing implement.  
   (l) Harrison special (medium).  
   (m) Unirrigated.  
   (n) 4 hand weedings, 2 intercultures with planet junior hoe both ways and 3rd interculture with country plough.  
   (o) 7.23'.  
   (p) 22.1.1959 to 5.3.1959.

2. **TREATMENTS and DESIGN**:
   Same as in expt. no. 57(19) on page 603.

3. **DESIGN**:
   (i) Split-plot.  
   (ii) 4 main-plots/replication; 3 sub-plots/main-plot.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) 19.25'x16.5'.  
   (b) 13.75'x11.0'.  
   (v) 24'x24'.  
   (vi) Yes.

4. **GENERAL**:
   (i) Considerable number of plants were lodged due to heavy rains in Feb.  
   (ii) Spraying was done with DDT against caterpillars and with Basudin against aphids.  
   (iii) Heavy rains.  
   (iv) (a) 1958—contd. (modified in 15.9).  
   (b) N.A.  
   (c) Nil.  
   (d) Nil.

5. **RESULTS**:
   (i) 7142 lb./ac.  
   (ii) 716.5 lb./ac.  
   (iii) None of the effects is significant.

---

**Crop:** Tobacco (Rabi).  
**Site:** Central Tobacco Res. Instt., Rajahmundry.  
**Type:** T.O.

Object: To study the effect of deep ploughing with tractor and harrowing on the yield of flue cured Tobacco.

1. **BASAL CONDITIONS**:
   (i) Continuous tobacco.  
   (b) Tobacco.  
   (c) N.A.  
   (ii) (a) Deep black soil.  
   (b) N.A.  
   (iii) N.A./13.11.1958.  
   (iv) (a) As per treatments.  
   (b) Transplanted.  
   (c) N.A.  
   (d) 33'x33'.  
   (e) 1.  
   (f) 100 lb./ac. of A/S with the help of deep placing implement.  
   (g) Harrison special (medium); cigarette.  
   (h) Unirrigated.  
   (i) 1 hand weeding after planting, 1 interculture with planet junior hoe and 1 with country plough.  
   (j) 7.23'.  
   (k) 16.1.1959 to 4.4.1959.

2. **TREATMENTS**:
   Main-plot treatments:  
   4 levels of ploughing with country plough : P0=No ploughing, P1=1, P2=2 and P3=3 ploughings.

   Sub-plot treatments:  
   3 levels of harrowing with plain blade harrow : H0=No harrowing, H1=1 and H2=2 harrowings.

3. **DESIGN**:
   (i) Split-plot.  
   (ii) (a) 4 main-plots/replication; 3 sub-plots/main-plot.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) 19.25'x16.5'.  
   (b) 13.75'x11.0'.  
   (v) 24'x24'.  
   (vi) Yes.

4. **GENERAL**:
   (i) Considerable number of plants were lodged due to heavy rains in Feb.  
   (ii) Spraying was done with DDT against caterpillars and with Basudin against aphids. Orbanchees were removed and burnt as and when it was necessary.  
   (iii) Yield of green leaf.  
   (iv) (a) 1958—contd. (modified in 15.9).  
   (b) N.A.  
   (c) Nil.  
   (d) Nil.

5. **RESULTS**:
   (i) 7242 lb./ac.  
   (ii) 716.5 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of green leaf in lb./ac.
### Basal Conditions:

1. **(i) (a)** Continuous tobacco.  
   **(b)** Tobacco.  
   **(c)** 20 lb./ac. of N as A.S.  
2. **(ii) (a)** Deep black soil.  
3. **(iii)** N.A.  
4. **(iv) (a)** As per treatments.  
5. **(b)** Transplanting.  
6. **(c)** N.A.  
7. **(d)** 3 tons/ac. of P Y.M. + 10 lb./ac. of A/S.  
8. **(e)** Harrison special (medium; cigarette).  
9. **(f)** Irrigated.  
10. **(g)** 1 hand weeding, 5 intercultivations—4 with plain junior hoe and 1 with country plough.  
11. **(h)** 1.15'.  

### Treatments:

1. **Main-plot treatments:**
   4 levels of ploughing:  
   - $P_0$: No ploughing,  
   - $P_1$: 1,  
   - $P_2$: 2,  
   - $P_3$: 3 ploughings.  

2. **Sub-plot treatments:**
   5 levels of harrowing:  
   - $H_0$: No harrowing,  
   - $H_1$: 1,  
   - $H_2$: 2,  
   - $H_3$: 3,  
   - $H_4$: 4 harrowings.

### Design:

1. Split-plot.  
2. **(i)** 4 main-plots/replication; 5 sub-plots/main-plot.  
3. **(b)** 27.5' x 16.5'.  
4. **(c)** Yes.

### General:

1. **(i)** Normal.  
2. **(ii)** Caterpillar attack noticed.  
3. **(iii)** Endrin sprayed at 2 ozs. in 10 gallons of water. Two hand pickings.  
4. **(iv)** Aphids attack noticed.  
5. **(v)** Spraying of Basudin at 2 oz. in 10 gallons of water.  
6. **(vi)** Orobanche removed at 10 days interval.  
7. **(vii)** Heavy rains.  
8. **(viii)** Due to continuous wet weather during the months of August and September, tillage operations could not be properly spread out.

### Results:

1. **(i)** 4510 lb./ac.  
2. **(ii)** 1069.9 lb./ac.  
3. **(iii)** None of the effects is significant.  
4. **(iv)** Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$H_0$</th>
<th>$H_1$</th>
<th>$H_2$</th>
<th>$H_3$</th>
<th>$H_4$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_0$</td>
<td>4747</td>
<td>4239</td>
<td>4143</td>
<td>4822</td>
<td>4381</td>
<td>4466</td>
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<td>$P_1$</td>
<td>4991</td>
<td>4969</td>
<td>3879</td>
<td>4105</td>
<td>4632</td>
<td>4515</td>
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<td>$P_2$</td>
<td>4325</td>
<td>4590</td>
<td>4746</td>
<td>4044</td>
<td>4701</td>
<td>4421</td>
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<tr>
<td>$P_3$</td>
<td>4413</td>
<td>4702</td>
<td>4471</td>
<td>4637</td>
<td>4967</td>
<td>4638</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>4544</td>
<td>4625</td>
<td>4310</td>
<td>4402</td>
<td>4670</td>
<td>4510</td>
</tr>
</tbody>
</table>
S.E. of difference of two

1. P marginal means = 338.3 lb./ac.
2. H marginal means = 190.1 lb./ac.
3. H means at the same level of P = 302.2 lb./ac.
4. P means at the same level of H = 479.7 lb./ac.

Crop => Tobacco (Rabi).
Ref => C.T.R.I. 56(13).
Site => Central Tobacco Res. Instt., Rajahmundry. Type => ‘C’.
Object => To study the effect of bunding and ridging on the conservation of soil moisture, yield and quality of cigarette Tobacco in normal cultivation field.

1. BASAL CONDITIONS:
(i) (a) Continuous tobacco. (b) Tobacco. (ii) (a) Heavy black soil. (b) N.A. (iii) N.A.; 20.11.1956. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33" x 33". (e) 1. (v) 100 lb./ac. of A.S applied before planting in ploughed furrows. (vi) Harrison special (medium). (vii) Unirrigated. (viii) I interculture with placet junior hoe. (ix) 1.14". (x) 4.2.1957 to 11.3.1957.

2. TREATMENTS:
Main-plot treatments:
4 cultural treatments: C₁ = Bunding, C₂ = Ridging, C₃ = Ridging just before planting and C₄ = Normal ploughing.

Sub-plot treatments:
2 cultivation treatments: S₁ = Normal cultivation and S₂ = Artificial mulching with paddy straw.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 33" x 8" 3". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS:
(i) 6572 lb./ac. (ii) (a) 543.5 lb./ac. (b) 635.4 lb./ac. (iii) Only interaction C x S is significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
<th>C₄</th>
<th>Mean</th>
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<tr>
<td>S₁</td>
<td>6683</td>
<td>6766</td>
<td>5961</td>
<td>6534</td>
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<td>S₂</td>
<td>6671</td>
<td>6349</td>
<td>6830</td>
<td>6781</td>
</tr>
</tbody>
</table>

Mean 6676 6558 6396 6658 6572

S.E. of difference of two

1. C marginal means = 271.8 lb./ac.
2. S marginal means = 224.4 lb./ac.
3. S means at the same level of C = 449.3 lb./ac.
4. C means at the same level of S = 418.1 lb./ac.

Crop => Tobacco (Rabi).
Ref => C.T.R.I. 56(14).
Site => Central Tobacco Res. Instt., Rajahmundry. Type => ‘C’.
Object => To study the effect of bunding and ridging on the conservation of soil moisture, yield and quality of cigarette Tobacco in tractor ploughed field.
1. BASAL CONDITIONS:
   (i) Continuous tobacco. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) N.A. (iii) N.A./20.11.1956. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33°×33°. (e) 1. (v) 100 lb/ac. of A/S applied before planting in ploughed furrows. (wii) Harrison special (medium). (viii) Unirrigated. (viii) I interculture with planet junior hoe. (ix) 1.14°. (x) 4.2.1957 to 11.3.1957.

2. TREATMENTS:
   Same as in exp. no. 56(13) on page 606.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 24° 9′×8° 4′. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) to (c) No. (v) to (viii) Nil.

5. RESULTS:
   (i) 5671 lb/ac. (ii) (a) 460.8 lb/ac. (b) 364.2 lb/ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of green leaf in lb/ac.

<table>
<thead>
<tr>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>Mean</th>
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<tr>
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<tr>
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<td>5800</td>
<td>5620</td>
<td>5588</td>
<td>5666</td>
</tr>
</tbody>
</table>

   S.E of difference of two
   1. C marginal means = 230.4 lb/ac.
   2. S marginal means = 128.8 lb/ac.
   3. S means at the same level of C = 217.5 lb/ac.
   4. C means at the same level of S = 293.7 lb/ac.

---

Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Instt., Rajahmundry.
Type: C.T.R.I. 55(9).
Ref: C.T.R.I. 55(9).

Object: To study the effect of different methods of preparatory cultivation on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) 20 and 40 lb/ac. of N as A/S+50 lb/ac. of P2O5 as Kudai's phos. and Super were applied according to treatments in the year 1954-1955 in ploughed furrows. (ii) (a) Deep black soil. (b) N.A. (iii) N.A./31.11.1955. (iv) (a) As per treatments. (b) Transplanting. (c) N.A. (d) 33°×33°. (e) 1. (f) Nil. (vi) Harrison special (medium). (vii) Unirrigated. (viii) 2 hand weedings, 1 interculture with planet junior hoe and 1 with country plough. (ix) N.A. (x) 16.1.1956 to 2.3.1956.

2. TREATMENTS:
   4 cultural treatments: C1= Ploughing 5 times with country plough (control), C2= Ploughing 12 times with iron plough, C3= Unploughed till October and then 2 ploughings with country plough and C4= Cultivation with planet junior hoe during monsoon and 2 ploughings with country plough later.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 24° 9′×157° 6′. (b) 13° 3′×132° 0′. (v) 24°×24°. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1955—contd. (b) Nil. (v) (a) and (b) Nil. (vi) Heavy rains. (vii) Planting was done on 13.10.1955 but due to heavy rains replanting had to be done.

5. RESULTS:
(i) 4963 lb./ac. (ii) 301.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C1</th>
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<th>C3</th>
<th>C4</th>
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<td>5427</td>
<td>5678</td>
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<tr>
<td>S.E./mean</td>
<td>150.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Crop : Tobacco (Rabi).  
Site : Central Tobacco Res. Instit., Rajahmundry. Type : 'C'.

Object : To study the effect of different methods of preparatory cultivation on physical condition of soil, yield and quality of cigarette Tobacco.

4. BASAL CONDITIONS:
(i) (a) Continuous tobacco. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) N.A. (iii) N.A./20 and 21.11.1956. (iv) (a) As per treatments. (b) Transplanting. (c) N.A. (d) 33" × 33". (e) N.A. (v) 100 lb./ac. of A/S applied before planting in ploughed fursows. (vi) Harrison special (medium). (vii) Un-irrigated. (viii) 2 intercultures. 1 with guntak and the other with planet junior hoe. (ix) 1.39". (x) 25.1.1957 to 6.3.1957.

2. TREATMENTS:
4 cultural treatments : C1=Control (5 ploughings with country plough), C2=Normal cultivation (5 ploughings with wooden plough), C3=2 ploughings with iron plough and 5 times with country plough and C4=Cultivation with planet junior hoe during monsoon and 3 ploughings with country plough.

3. DESIGN:
Same as in exp. no. 55(9) on page 607.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1955—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 6134 lb./ac. (ii) 350.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>5930</td>
<td>6129</td>
<td>6153</td>
<td>6123</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>175.1 lb./ac.</td>
<td></td>
<td></td>
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</tbody>
</table>

Crop : Tobacco. 
Ref : C.T.R.I. 54(37). 
Site : Hookah and Chewing Tobacco Res. Stn., Pusa.  
Type : 'CV'.

Object : To find out the effect of piercing and non-piercing of stem on different varieties of hookah and chewing Tobacco.
1. BASAL CONDITIONS:
(i) Tobacco—Maize-Rahar mixture. (b) Maize-Rahar mixture. (c) Nil. (d) (a) Gangetic alluvium calcareous. (b) N.A. (iii) N.A./20.10.1954. (iv) (a) to (c) N.A. (d) 3' x 2'. (e) I. (v) G.M. with saw hemp. (vi) As per treatments. (vii) Irrigated. (viii) 1 intercultivating, 3 weedings, 1 topping as usual and 6 suckerings. (ix) 46.73'. (x) 13.3.1955.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 varieties of tobacco: \( V_1 = \text{N.P.} - 70 \), \( V_2 = \text{Bharao-93} \) and \( V_3 = \text{Bori Mahespur} \).
(2) 2 levels of piercing: \( M_0 = \) No piercing and \( M_1 = \) Piercing.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 18' x 30'. (b) 12' x 36'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:
(i) Crop was poor and the stand was also not good. (ii) Attack of leaf curl, mosaic, cutworm, and caterpillars. Hand picking of larvae. (iii) Yield of cured leaf. (iv) (a) 1953—1958 (modified in 1954). (b) No. (c) Nil. (v) and (vi) Nil. (vii) The land was subject to water lodging.

5. RESULTS:
(i) 1521 lb./ac. (ii) 250.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
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<tbody>
<tr>
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<td>1570</td>
<td>1428</td>
<td>1499</td>
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<tr>
<td>( M_1 )</td>
<td>1474</td>
<td>1669</td>
<td>1485</td>
<td>1543</td>
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</table>

S.E. of M marginal mean = 59.1 lb./ac.
S.E. of V marginal mean = 72.4 lb./ac.
S.E. of body of table = 102.4 lb./ac.

Crop: Tobacco \( (Rabi) \).
Site: Hookah and Chewing Tobacco Res. Strn., Pusa.
Type: CV.

Object: To find out the effect of piercing and non-piercing of stem on different varieties of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
(i) (a) Maize-Rahar—Tobacco. (b) Maize-Rahar. (c) Nil. (d) (a) Gangetic alluvium calcareous. (b) N.A. (iii) N.A./20.10.1955. (iv) (a) 1 ploughing by planet junior cultivator. (b) Transplanting. (c) 2 lb./ac. (d) 3' x 2'. (e) 1. (f) G.M. with saw hemp. (vi) As per treatments. (vii) Irrigated. (viii) 4 weedings and mulching, 4 suckerings and topping. (ix) 6.11'. (x) 11 and 12.3.1956.

2. TREATMENTS:
Same as in exp. no. 54(37) page 608.

3. DESIGN:
(i) R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) 18' x 36'. (b) 12' x 32'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:

5. RESULTS:
(i) 1292 lb./ac. (ii) 250.8 lb./ac. (iii) Only V effect is highly significant. (iv) Av. yield of cured leaf in lb./ac.
Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Sta., Pusa.

Object: To study the effect of piercing and non-piercing of stem on different varieties of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Maize-Rabar—Tobacco. (b) Maize-Rabar. (c) Nil. (ii) (a) Gangetic alluvium calcareous. (b) N.A. (iii) N.A./9.10.1956. (iv) (a) 1 ploughing by peasant junior cultivator. (b) Transplanting. (c) 2 lb./ac. (d) 3'×2'. (e) I. (f) G.M. with seedlings. (g) As per treatments. (h) Irrigated. (i) 2 weedicides and mulching. (j) 6 suckings and topping. (k) 14.9°. (l) 22.2.1957.

2. TREATMENTS:
   Same as in expt. no. 54(37) on page 608.

3. DESIGN:
   (i) R.B D. (ii) 6. (b) N.A. (iii) 5. (iv) (a) 18'×35'. (b) 12'×32'. (c) 3'×2'. (d) Yes.

4. GENERAL:
   (i) Good. (ii) Attack of leaf curl and mosaic. (iii) Yield of cured leaf. Measurements of leaf length and breadth. (iv) (a) 1951—1958. (b) No. (c) Nil. (d) (a) and (b) Nil. (v) Hailstorm on 9.1.1957. (vi) Nil.

5. RESULTS:
   (i) 1894 lb./ac. (ii) 154.5 lb./ac. (iii) Only V effect is highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
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<td>1738</td>
<td>1928</td>
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<tr>
<td>M₁</td>
<td>1943</td>
<td>1929</td>
<td>1706</td>
<td>1894</td>
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</tbody>
</table>

S.E. of M marginal mean = 39.9 lb./ac.
S.E. of V marginal mean = 48.9 lb./ac.
S.E. of body of table = 69.1 lb./ac.

---

Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Sta., Pusa.

Object: To study the effect of piercing and non-piercing of stem on different varieties of hookah and chewing Tobacco.

Type: ‘CV’.

Ref: C.T.R.I. 57(20).
Type: ‘CV’.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Indo-genetic alluvium calcareous. (b) N.A. (iii) 20.9.1957.
(iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3' x 2'. (e) 1. (v) G.M. with sannhemp. (vi)
As per treatments. (vii) Irrigated. (viii) 2 weeding, topping and suckering. (ix) 49.3'. (x) 15.2.1958.

2. TREATMENTS:
Same as in exp. no. 54(37) on page 608.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 3' x 36'. (b) 12' x 32'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1954—1958. (b) No. (c) Nil.
(v) to (vii) Nil.

5. RESULTS:
(i) 2156 lb./ac. (ii) 346.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>V3</th>
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<td>M1</td>
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<td>2287</td>
<td>1941</td>
<td>2192</td>
</tr>
<tr>
<td>Mean</td>
<td>2210</td>
<td>2259</td>
<td>1978</td>
<td>2156</td>
</tr>
</tbody>
</table>

S.E. of M marginal mean = 81.6 lb./ac.
S.E. of V marginal mean = 100.0 lb./ac.
S.E. of body of table = 141.4 lb./ac.

Crop :- Tobacco (Rabi).
Site :- Hookah and Chewing Tobacco Res. Stn., Fusa. Type :- 'CV'.
Object :— To study the effect of piercing and non-piercing of stem on different varieties of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Indo-genetic alluvium calcareous. (b) N.A. (iii) 20.9.1958.
(iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3' x 2'. (e) 1. (v) G.M. with sannhemp. (vi)
As per treatments. (vii) Irrigated. (viii) 2 weeding, topping and suckering. (ix) 19.1'. (x) 21.2.1959.

2. TREATMENTS:
Same as in exp. no. 54(37) on page 608.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 15' x 32'. (b) 9' x 26'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1954—1958. (b) No. (c) Nil.
(v) to (vii) Nil.

5. RESULTS:
(i) 2363 lb./ac. (ii) 137.6 lb./ac. (iii) Only V effect is highly significant. (iv) Av. yield of cured leaf in lb./ac.
612

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
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<th>( V_3 )</th>
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<td>2089</td>
<td>2339</td>
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<td>( M_1 )</td>
<td>2432</td>
<td>2649</td>
<td>2079</td>
<td>2187</td>
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<tr>
<td>Mean</td>
<td>2442</td>
<td>2563</td>
<td>2084</td>
<td>2363</td>
</tr>
</tbody>
</table>

S.E. of \( M \) marginal mean = 32.4 lb./ac.
S.E. of \( V \) marginal mean = 39.7 lb./ac.
S.E. of body of table = 56.2 lb./ac.

**Crop:** Tobacco (\textit{Rahi}).
**Ref:** C.T.R.I. 55(17).
**Site:** Hookah and Chewing Tobacco Res. Stn., Pusa. **Type:** 'CV'.

Object: – To find out the effect of different planting times on the yield and quality of different varieties of hookah and chewing Tobacco.

1. **BASAL CONDITIONS:**
   - (i) (a) Maize + Rahar Tobacco. (b) Maize + Rahar. (c) Nil. (ii) (a) Gangetic alluvium calcareous. (b) N.A. (iii) As per treatments. (iv) (a) 1 ploughing by planet junior cultivator. (b) Transplanting. (c) 2 lb./ac. (d) 1\( \times 1' \). (e) 1. (f) G.M. with samundra. (g) As per treatments. (h) Irrigated. (i) 4 weedings and matching 6 suckerings and 1 topping. (j) 6.1', (k) 8.1956, 7, 20 and 26.2.1956.

2. **TREATMENTS:**
   - All combinations of (1) and (2)
     1. 3 dates of planting : \( D_1 = 15.10.1955 \), \( D_2 = 1.11.1955 \) and \( D_3 = 16.11.1955 \).
     2. 10 varieties of tobacco : \( V_1 = N.P.-18 \), \( V_2 = N.P.-216 \), \( V_3 = N.P.-218 \), \( V_4 = N.P.-230 \), \( V_5 = N.P.-222 \), \( V_6 = T-26 \), \( V_7 = T-174 \), \( V_8 = T-218 \), \( V_9 = T-238 \) and \( V_{10} = Kharagpur \).

3. **DESIGN:**
   - (i) R.R.D. (ii) (a) 30. (b) N.A. (iii) 3. (iv) (a) \( 7.5 \times 6' \). (b) \( 4.5' \times 1'. \) (v) \( 1.5' \times 1.0' \). (vi) Yes.

4. **GENERAL:**

5. **RESULTS:**
   - (i) 1925 lb./ac. (ii) 557.5 lb./ac. (iii) All effects are highly significant. (iv) Av. yield of cured leaf in lb./ac.

\[
\begin{array}{cccccccc|c}
\text{V}_1 & \text{V}_2 & \text{V}_3 & \text{V}_4 & \text{V}_5 & \text{V}_6 & \text{V}_7 & \text{V}_8 & \text{V}_{10} & \text{Mean} \\
\hline
\text{D}_1 & 2001 & 2333 & 2517 & 2339 & 2549 & 1646 & 1646 & 3001 & 2549 & 1859 & 2364 \\
\text{D}_2 & 1742 & 2243 & 2161 & 2333 & 2226 & 1871 & 1694 & 2646 & 1920 & 2192 & 2097 \\
\text{D}_3 & 1420 & 1145 & 1468 & 1662 & 1049 & 1063 & 1275 & 1468 & 1888 & 1854 & 1413 \\
\hline
\text{Mean} & 1726 & 1968 & 2049 & 2178 & 1935 & 1593 & 1549 & 2372 & 2113 & 1823 & 1925 \\
\end{array}
\]

S.E. of \( D \) marginal mean = 101.8 lb./ac.
S.E. of \( V \) marginal mean = 183.8 lb./ac.
S.E. of body of table = 321.9 lb./ac.
613

Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Stat., Pusa
Object: To find out the effect of different planting times on the yield and quality of different varieties of hookah Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Maize and Rahar—Tobacco. (b) Maize and Rahar. (c) Nil. (ii) (a) Gangenic aluvium calcareous. (b) N.A. (iii) As per treatments. (iv) (a) 1 ploughing by plante junior cultivator. (b) Transplanting. (c) 2 lb/ac. (d) 1' x 1'. (e) One. (v) G.M. with sunnhemp. (vi) As per treatments. (vii) Irrigated. (viii) 6 weeding, mashing, topping and 3 suckerings. (ix) 14.0", (x) 24.2 1957 to 12.3.1957.

2. TREATMENTS:
   All combinations of (1) and (7)
   (1) 3 dates of planting: D1 = 6.10.1956, D2 = 1.11.1956 and D3 = 16.11.1956.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication : 12 sub-plots/main-plot. (b) N.A. (iii) As per treatments. (iv) (a) 12' x 21'. (b) 1' x 1'. (v) Yes.

4. GENERAL:
   (i) Fair. (ii) Attack of leaf curl. (iii) Cured leaf yield. (iv) (a) 1955—1959. (b) No. (c) Nil. (vi) and (b) Nil. (v) Hail storm on 9.1.1957. (vi) Nil.

5. RESULTS:
   (i) 16 lb/ac. (ii) 6.83 lb/ac. (b) 297.0 lb/ac. (iii) V effect alone is highly significant. (iv) Av. yield of cured leaf in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
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<th>V8</th>
<th>V9</th>
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<td>755</td>
<td>1200</td>
<td>1377</td>
<td>1607</td>
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<td>2134</td>
<td>1754</td>
<td>2229</td>
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<td>1307</td>
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<tr>
<td>D2</td>
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<td>1120</td>
<td>1297</td>
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<td>741</td>
<td>1050</td>
<td>1062</td>
<td>1089</td>
<td>1164</td>
<td>1016</td>
<td>1849</td>
<td>1198</td>
<td>1955</td>
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<td>1421</td>
<td>2178</td>
<td>1235</td>
<td>1108</td>
<td>1262</td>
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</table>

S.E. of difference of two
1. D marginal means = 130.3 lb/ac.
2. V marginal means = 121.2 lb/ac.
3. M means at the same level of D = 210.0 lb/ac.
4. D means at the same level of V = 239.6 lb/ac.

Object: To study the effect of planting time on the yield of different varieties of hookah Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sunnhemp. (c) Nil. (ii) (a) Indo-gangenic aluvium calcareous. (b) N.A. (iii) As per treatments. (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb/ac. (d) 1' x 1'. (e) 1. (v) G.M. with sunnhemp. (vi) As per treatments. (vii) Irrigated. (viii) 4 weeding, topping and suckering. (ix) 16 1. 1956, 29.1.1958, 8.2.1958 and 25.2.1958.
2. TREATMENTS:

Main-plot treatments:
- 4 dates of planting: D1 = 15th September, D2 = 1st October, D3 = 16th October and D4 = 1st November.

Sub-plot treatments:

3. DESIGN:
- (i) Split-plot. (ii) (a) 4 main-plots/replication; 12 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10'x21', (b) 8'x18'. (v) 1'x1.5'. (vi) Yes.

4. GENERAL:
- (i) Good. (ii) Attack of leaf curl and mosaic. (iii) Cured leaf yield. (iv) (a) 1555—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
<th>V6</th>
<th>V7</th>
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<th>V9</th>
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<td>1661</td>
<td>1938</td>
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<td>1359</td>
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</table>

S.E. of difference of two
1. D marginal means = 286.1 lb./ac.
2. V marginal means = 121.2 lb./ac.
3. V means at the same level of D = 242.4 lb./ac.
4. D means at the same level of V = 368.4 lb./ac.

Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Sta., Pusa.
Object: To study the effect of time of planting on the yield and quality of different varieties of hookah Tobacco.

1. BASAL CONDITIONS:
- (i) Nil (b) Samkhemp. (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) As per treatments. (iv) (a) 4 ploughings (b) Transplanting. (c) 4 lb./ac. (d) 1'x11'. (e) I. (v) G.M. with Samkhemp. Top dressing with A.S. (vi) As per treatments. (vii) Irrigated. (viii) 6 weeding, topping and suckerings. (ix) 19.1". (x) 1, 11, 20.1.1959, 20.2.1959 and 6.3.1959.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 57,214 on page 613.

5. RESULTS:
- (i) 1959 lb./ac. (ii) (a) 702.6 lb./ac. (b) 286.2 lb./ac. (iii) All effects are highly significant. (iv) Av. yield of cured leaf in lb./ac.
Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Sta., Pusa.
Type: ‘CV’.

Object: To study the effect of planting times on the yield of different varieties of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sannhemp (G.M.). (c) Nil. (ii) (a) Indegagetic alluvium calcareous. (b) N.A. (iii) As per treatments. (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 1’x13’. (e) 1. (v) G.M’ with sannhemp. (vi) As per treatments. (vii) Irrigated. (viii) 4 weedings, topping and suckering. (ix) 19.6’. (x) 27.12.1959 and 5.2.1960.

2. TREATMENTS:
Main-plot treatments:
4 times of planting: D1=15th September, D2=3rd October, D3=16th October and D4=2nd November. 
Sub-plot treatments:
3 varieties: V1=N.P.—220, V2=T—238 and V3=Rustica tabaccum (back cross).

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10’x21’. (b) 8’x18’. (v) 1’x1.5’. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of cutworm and leaf curl. (iii) Yield of cured leaf. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1403 lb./ac. (ii) (a) 435.8 lb./ac. (b) 289.8 lb./ac. (iii) Main effects of V and D are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Mean</th>
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<tr>
<td>V1</td>
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<td>955</td>
<td>1340</td>
<td>2003</td>
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<tr>
<td>V2</td>
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<tr>
<td>V3</td>
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<tr>
<td>Mean</td>
<td>494</td>
<td>1221</td>
<td>1619</td>
<td>2280</td>
</tr>
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</table>
Object:—To find out a method of preparing seed beds to produce more number of transplantable seedlings per unit area in clay soils.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sorghum. (c) Nil. (ii) (a) Black clay. (b) N.A. (iii) 4.9.1951. (iv) (a) 3 ploughings and 2 harrowings. (b) N.A. (c) 3.8 lb./ac. (d) and (e) N.A. (v) 65 lb./ac. of N as A/S+35 lb./ac. of P₂O₅ as Super-P 52 lb./ac. of K₂O as Pot. Sul. (vi) Harrison special. (vii) Irrigated. (viii) N.A. (ix) 19.81°. (x) Plants pulled out on 27.10.1954 to 6.11.1954.

2. TREATMENTS:
   8 methods of preparation of seed bed: M₁=Normal without application of sand (ryots' method), M₂=Normal with incorporation of sand, M₃=Earth removed to a depth of 9" and filled with sand and gravel overlaid with 5" layer of earth and sand, M₄=Earth removed to a depth of 9" and filled with furnace cinder overlaid with 5" layer of earth and sand, M₅=Earth removed to a depth of 9" and filled with dry sorghum stubbles and earth in layers overlaid with 5" layer of earth and sand, M₆=Earth removed to a depth of 9" and filled with groundnut shells overlaid with 5" layer of earth and sand and M₇=Earth removed to a depth of 9" and filled with paddy husk overlaid with 5" layer of earth and sand.

3. DESIGN:
   (i) R.B.D. (ii) 8. (b) N.A. (iii) 4. (iv) (a) 4'x6'. (b) 2'x5'. (v) 9'x9'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) A little caterpillar attack and "damping off" disease were observed in all plots. The pest attack was checked by hand picking and "damping off" was controlled by spraying Bordeaux mixture. (iii) Number of transplantable seedlings. (iv) (a) 1953-1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 296 lb./ac. (ii) 71.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. number of transplantable seedlings/bed.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
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<tr>
<td>Av. number</td>
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<td>343</td>
<td>251</td>
<td>201</td>
<td>577</td>
<td>60</td>
<td>452</td>
<td>113</td>
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</tbody>
</table>

SE/mean = 35.8 lb./ac.
1. **BASAL CONDITIONS**:

(i) (a) (c) As per treatments. (ii) (a) Black clay. (b) N.A. (iii) 10.10.1954. (iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 33" × 33". (e) N.A. (v) Nil. (vi) Harrison special. (vii) Unirrigated. (viii) 5 weedings and 1 interculture. (ix) 7.65'. (x) 3.1.1955 to 7.1.1955.

2. **TREATMENTS**:

All combinations of (1) and (2)

(1) 4 crops with manures during previous season: C₁=Maize in kharif with 20 lb. ac. of N as A/S+30 lb. ac. of P₂O₅ as Super-P+C L/ac. of F.Y.M., C₂=Maize in kharif without manure, C₃=Fallow with 6 C.L/ac. of F.Y.M. and C₄=Fallow without manure.

(2) 2 levels of N as A/S to tobacco crop: N₀=0 and N₁=20 lb./ac.

3. **DESIGN**:

(i) Fact. in R.B.D. (ii) 8. (b) N.A. (iii) 6. (iv) (a) 1/51.55 ac. (b) 1/80 ac. (v) 1 row around. (vi) Yes.

4. **GENERAL**:

(i) Good. (ii) Nil. (iii) Yield of green leaf, bright leaf and total bright leaf equivalent. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS**:

(i) 2312 lb./ac. (ii) 400.0 lb./ac. (iii) Main effects of N and C are highly significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
<th>C₄</th>
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<tr>
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<td>1058</td>
<td>2705</td>
<td>2903</td>
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<td>N₁</td>
<td>1537</td>
<td>1828</td>
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<td>2628</td>
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<tr>
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<td>1429</td>
<td>1443</td>
<td>3140</td>
<td>3237</td>
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</table>

S.E. of N marginal mean = 81.6 lb./ac.
S.E. of C marginal mean = 115.5 lb./ac.
S.E. of body of table = 163.3 lb./ac.

---

Crop := Tobacco.  
Site := Tobacco Res. Stn., Hunsur.  
Type := 'CM'.

Object := To study the effect of various cultural practices and manurial application on cigarette Tobacco yield.

1. **BASAL CONDITIONS**:

(i) (a) N.A. (b) Tobacco. (c) Nil. (ii) (a) Red sandy loam. (b) N.A. (iii) 5 to 10.8.1957. (iv) (a) Planting 3 to 4 times. (b) As per treatments. (c) 3 lb./ac. (d) 3:1 X 3:1. (e) N.A. (f) Nil. (g) Nil. (h) Harrison special. (i) Unirrigated. (j) Nil. (k) N.A. (l) 15.10.1957 to 15.12.1957.

2. **TREATMENTS**:

Main-plot treatments:

- 2 methods of planting: A₁=Flat and A₂=Ridge planting.

Sub-plot treatments:

- 2 mulchings: M₀=No mulching and M₁=Mulching.

Sub-sub-plot treatments:

- 4 manurial applications: B₁=Deep application of 20 lb./ac. of N, B₂=Deep application of 20 lb./ac. of N+40 lb./ac. of P₂O₅, B₃=Normal application of 20 lb./ac. of K₂O.

3. **DESIGN**:

(i) Split-plot. (ii) (a) 2 main-plots/replication; 2 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 90 plants. (v) Nil. (vi) Yes.
4. GENERAL:
(i) The crop suffered from drought about a month after planting. (ii) Nil. (iii) Yield of green leaf and bright and medium grades of cured leaf. (iv) (a) No. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 110 lb./ac. (ii) (a) 124.2 lb./ac. (b) 129.3 lb./ac. (c) 82.0 lb./ac. (iii) Interaction A×B alone is significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>B_1</th>
<th>B_2</th>
<th>B_3</th>
<th>B_4</th>
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<td>329</td>
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<td>353</td>
<td>271</td>
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<td>A_2</td>
<td>294</td>
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<td>259</td>
<td>353</td>
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<td>272</td>
<td>353</td>
<td>310</td>
<td>292</td>
<td>327</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. A marginal means = 31.0 lb./ac. 6. B means at the same level of M = 41.0 lb./ac.
2. M marginal means = 32.3 lb./ac. 7. M means at the same level of B = 40.0 lb./ac.
3. B marginal means = 29.0 lb./ac. 8. B means at the same level of A = 41.0 lb./ac.
4. M means at the same level of A = 45.7 lb./ac. 9. A means at the same level of B = 47.2 lb./ac.
5. A means at the same level of M = 44.8 lb./ac.

Crop :- Tobacco.  
Site :- Tobacco Res. Stn., Hanusur.  
Type :- 'CM'.

Object :- To study the effect of various cultural practices and manurial applications on the yield of cigarette Tobacco.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Tobacco. (c) Nil. (ii) (a) Sandy to red loam. (b) N.A. (iii) 6 and 8.8.1958. (iv) (a) and (b) As per treatments. (c) 3 lb./ac. (d) 33'x33'. (e) N.A. (v) Nil. (vi) Harrison special. (vii) Unirrigated. (viii) Nil. (ix) 8.76'. (x) 4.10.1518 to 15.11.1958.

2. TREATMENTS :
Main-plot treatments :
2 types of ploughings : P_1=Ordinary and P_2=Tractor ploughing.
Sub-plot treatments :
2 methods of planting : S_1=Flat planting and S_2=Ridge planting. 
Sub-sub-plot treatments :
2 mulchings : M_0=No mulching and M_1=Mulching. 
Sub-sub-sub-plot treatments :
All combinations of (1) and (2)
(1) 2 types of application : A_1=Deep and A_2=Normal application.
(2) 4 manural treatments : T_1=20 lb./ac. of N, T_2=40 lb./ac. of N, T_3=20 lb./ac. of N+100 lb./ac. of P_2O_5+50 lb./ac. of K_2O and T_4=40 lb./ac. of N+100 lb./ac. of P_2O_5+50 lb./ac. of K_2O.

3. DESIGN :
(i) Split-plot. (ii) 2 main-plots/replication ; 2 sub-plots/main-plot ; 2 sub-sub-plots/sub-plot and 8 sub-sub-sub-plots/sub-sub-plot. (b) N.A. (iii) 4. (iv) (a) 9×7=63 plants. (b) 7×5=35 plants. (v) 2 rows on all sides. (vi) Yes.

4. GENERAL :
(i) Fair. (ii) N.A. (iii) Weight of green leaf and bright grade of cured leaf. (iv) (a) 1958-1959. (b) Nil. (c) No. (v) to (vii) Nil.
5. RESULTS:

(i) 394 lb./ac. (ii) (a) 225.6 lb./ac. (b) 227.2 lb./ac. (c) 201.6 lb./ac. (d) 146.0 lb./ac. (iii) None of the effects is significant. (iv) Average yield of cigarette Tobacco in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$A_1$</th>
<th>$A_2$</th>
<th>$T_1$</th>
<th>$T_2$</th>
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<td>384</td>
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<td>$P_2$</td>
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<td>437</td>
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<td>401</td>
<td>341</td>
<td>326</td>
<td>445</td>
<td>461</td>
<td>394</td>
</tr>
</tbody>
</table>

S.E. of difference of two means:

1. $P$ marginal means $= 28.2$ lb./ac. $= 25.8$ lb./ac.
2. $S$ marginal means $= 28.4$ lb./ac. $= 28.4$ lb./ac.
3. $M$ marginal means $= 25.2$ lb./ac. $= 25.2$ lb./ac.
4. $A$ marginal means $= 18.3$ lb./ac. $= 18.3$ lb./ac.
5. $T$ marginal means $= 25.8$ lb./ac. $= 25.8$ lb./ac.
6. $P$ means at the same level of $S = 40.0$ lb./ac. $= 25.8$ lb./ac.
7. $S$ means at the same level of $P = 40.2$ lb./ac. $= 25.8$ lb./ac.
8. $P$ means at the same level of $M = 37.8$ lb./ac. $= 33.6$ lb./ac.
9. $M$ means at the same level of $P = 35.6$ lb./ac. $= 33.6$ lb./ac.
10. $P$ means at the same level of $A = 33.6$ lb./ac. $= 33.6$ lb./ac.
11. $A$ means at the same level of $P = 42.4$ lb./ac. $= 42.4$ lb./ac.
12. $P$ means at the same level of $T = 41.2$ lb./ac. $= 25.8$ lb./ac.

Crop: Tobacco.
Site: Tobacco Res. Sta., Hunsur.
Object: To study the effect of various cultural practices and manural applications on the yield of cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Sandy to loam. (b) N.A. (iii) 30.7.1959. (iv) (a) and (b) As per treatments. (c) 3 lb./ac. (d) 33" x 33". (e) N.A. (v) Nil. (vi) Harrison special. (vii) Unirrigated. (viii) Nil. (ix) 12.2'. (x) 5.10.1959 to 28.11.1959.

2. TREATMENTS:
   Main-plot treatments:
   - 2 times of ploughing: $P_1 =$ Iron plough (Myrex plough 8" to 10") and $P_2 =$ Ordinary ploughing (5" to 7").

   Sub-plot treatments:
   - 2 methods of planting: $S_1 =$ Flat and $S_2 =$ Ridge planting.

   Sub-sub-plot treatments:
   - 2 types of mulching: $M_0 =$ No mulching and $M_1 =$ Mulching.

Ref: C.T.R.I. 59(29).
Type: 'CMI'.
Sub-sub-sub-plot treatments:
All combinations of (1) and (2)
(1) 2 types of application: A₁ = Deep and A₂ = Normal application.
(2) 4 manural treatments: T₁ = 20 lb./ac. of N, T₂ = 40 lb./ac. of N, T₃ = 20 lb./ac. of P₂O₅ + 50 lb./ac. of K₂O and T₄ = 40 lb./ac. of N + 100 lb./ac. of P₂O₅ + 50 lb./ac. of K₂O.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication; 2 sub-plots/main-plot; 2 sub-sub-plots/sub-plot, and 8 sub-sub-sub-plots/sub-sub-plot. (b) N.A. (iii) 3. (iv) (a) 9 x 7 = 63 plants. (b) 7 x 5 = 35 plants, (v) 28 plants. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) N.A. (iii) Weight of green leaf and medium to bright grade of cured leaf. (iv) (a) 1958-1959. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 221 lb./ac. (ii) (a) 329.4 lb./ac. (b) 193.6 lb./ac. (c) 163.4 lb./ac. (d) 104.3 lb./ac. (iii) Main effect of T alone is highly significant. (iv) Av. yield of medium grade leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>M₁</th>
<th>M₂</th>
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</table>

S.E. of difference of two
1. P marginal means = 47.5 lb./ac.  13. T means at the same level of P = 21.3 lb./ac.
2. S marginal means = 27.9 lb./ac.  14. S means at the same level of M = 56.5 lb./ac.
3. M marginal means = 23.6 lb./ac.  15. M means at the same level of S = 33.4 lb./ac.
4. A marginal means = 15.1 lb./ac.  16. A means at the same level of T = 31.7 lb./ac.
5. T marginal means = 21.3 lb./ac.  17. S means at the same level of T = 32.2 lb./ac.
6. P means at the same level of S = 55.1 lb./ac.  18. A means at the same level of S = 21.3 lb./ac.
7. S means at the same level of P = 39.5 lb./ac.  19. T means at the same level of S = 30.1 lb./ac.
8. P means at the same level of M = 53.1 lb./ac.  20. M means at the same level of T = 28.0 lb./ac.
9. M means at the same level of P = 33.4 lb./ac.  21. M means at the same level of A = 31.1 lb./ac.
10. P means at the same level of A = 49.9 lb./ac.  22. A means at the same level of M = 21.3 lb./ac.
11. P means at the same level of T = 54.2 lb./ac.  23. T means at the same level of M = 30.1 lb./ac.
12. A means at the same level of P = 15.1 lb./ac.  S.E. of body of A × T table = 21.3 lb./ac.

Crop: Tobacco (Kharif).
Site: Tobacco Res. Stn., Hunsur.
Type: C.T.R.I. 59(25).
Object: To find the effect of F.Y.M. and rabing on the number of transplantable seedlings of cigarette Tobacco.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco. (c) Nil. (ii) (a) Red sandy loam. (b) N.A. (iii) 3.6.1959. (iv) (a) Ploughing 3 to 4 times. (b) Broadcasting. (c) 4 lb/ac. (d) Nil—being nursery exp. (e) N.A. (f) Nil. (vi) Harrison special. (vii) Unirrigated. (viii) Nil. (ix) 22.6°. (x) 30.7.1959 to 8.9.1959.

2. TREATMENTS:
Main-plot treatments:
3 types of rabings: R₀—No rabling, R₁=Rabling and ash removed and R₂=Rabling and ash not removed.
Sub-plot treatments:
All combinations of (1) and (2)
(1) 3 levels of F.Y.M.: F₁=10, F₂=20 and F₃=40 tons/ac.
(2) 2 methods of application: M₁=As layer and M₂=Mixed with the soil.

3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/repetition; 6 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 4' × 4.75' of bed. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Due to heavy rains the growth of seedlings was pale and stunted. (ii) Anthracnose was observed and it was controlled by spraying Bordeaux mixture and Ditbane. (iii) Germination count and transplantable seedlings. (iv) (a) 1959—1961. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 115 seedlings/bed. (ii) (a) 717 seedlings/bed. (b) 510 seedlings/bed. (iii) Main effect of F alone is highly significant. (iv) Av. no. of seedlings/bed.

<table>
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<th></th>
<th>R₀</th>
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<th>R₂</th>
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</table>

S.E. of difference of two
1. R marginal means = 169 seedlings/bed. 5. R means at the same level of M = 207 seedlings/bed.
2. F marginal means = 120 seedlings/bed. 6. F means at the same level of R = 208 seedlings/bed.
3. M marginal means = 98 seedlings/bed. 7. R means at the same level of F = 239 seedlings/bed.
4. M means at the same level of R = 170 seedlings/bed. S.E. of body of F×M table = 120 seedlings/bed.

Site: Tobacco Res. Sta., Hunsur. Type: 'CM'.

Object: To find the effect of F.Y.M. on the number of transplantable seedlings of cigarette Tobacco.
2. TREATMENTS:

All combinations of (1) and (2)
(1) 3 levels of F.Y.M.: \( F_1 = 10 \), \( F_2 = 20 \) and \( F_3 = 30 \) tons/ac.
(2) 2 methods of application: \( M_1 = \text{As layer} \) and \( M_2 = \text{Mixed with soil} \).

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 4' \times 4.75' of bed. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Nil. (ii) Anthracnose (leaf spot disease) was observed and was controlled by spraying Bordeaux mixture and Dithane. (iii) Germination count and transplantable seedlings. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Due to heavy rains on 7.5.1958 and 12.5.1958, considerable washing off occurred and hence the beds were resown on 28.5.1958. (vii) Nil.

5. RESULTS:

(i) 1031 seedlings/bed. (ii) 238 seedlings/bed. (iii) None of the effects is significant. (iv) Av. number of seedlings/bed.

<table>
<thead>
<tr>
<th></th>
<th>( F_1 )</th>
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<td>( M_2 )</td>
<td>924</td>
<td>1002</td>
<td>1164</td>
<td>1030</td>
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<tr>
<td>Mean</td>
<td>935</td>
<td>999</td>
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</table>

S.E. of F marginal mean = 69 seedlings/bed.
S.E. of M marginal mean = 56 seedlings/bed.
S.E. of body of table = 97 seedlings/bed.

Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Stn., Pusa.
Object: To study the effect of manures and fertilizers in relation to topping and spacing on the yield and quality of hookah and chewing Tobacco.

1. BASAL CONDITIONS:

(i) (a) Maize+Rabar—Tobacco. (b) Maize+Rabar. (c) Nil. (ii) Gangetic alluvium calcareous. (b) N.A. (iii) 22, 23 and 25.9.1955. (iv) (a) 1 ploughing by plough junior cultivator. (b) Transplanting. (c) 2 lb./ac. (d) As per treatments. (e) 1. (v) Nil. (vi) Bori Bharao—63 (medium). (vii) Irrigated. (viii) 4 weedings and hoeing, 8 suckerings and topping. (ix) 6.1'. (x) 18, 22.2.1956 and 4, 7.3.1956.

2. TREATMENTS:

Maize-plot treatments:
2 levels of G.M.: \( G_1 = \text{G.M. by saamthemp} \) and \( G_2 = 500 \) mda/ac. of F.Y.M.

Sub-plot treatments:
4 levels of N as A/S: \( N_0 = 0 \), \( N_1 = 50 \), \( N_2 = 100 \) and \( N_3 = 150 \) lb./ac.

Sub-sub-plot treatments:
All combinations of (1) and (2)
(1) 3 rates of topping: \( T_1 = 10 \), \( T_2 = 14 \) and \( T_3 = 14 \) leaves/plant.
(2) 3 spacings between plants: \( S_1 = 2' \), \( S_2 = 2.5' \) and \( S_3 = 3' \).
Spacing between rows is 3'.

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/replcation; 4 sub-plots/main-plot and 9 sub-sub-plots/sub-plot. (b) N.A.
(iii) 4. (iv) (a) 15' \times 30'. (b) 9' \times 25'. (v) 3' \times 2.5'. (vi) Yes.
4. GENERAL:
(i) Fair. (ii) Attack of cutworm and caterpillars. Leaf curl and mosaic. 50% DDT sprayed. (iii) Yield of cured leaf. (iv) (a) 1955-1959. (b) Nil. (v) Nil. (vi) Nil.

5. RESULTS:
(i) 1824 lb./ac. (ii) (a) 347.9 lb./ac. (b) 458.8 lb./ac. (c) 285.6 lb./ac. (iii) Main effects of G, S, N and T are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>S2</th>
<th>S3</th>
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<td>N2</td>
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<tr>
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<td>2489</td>
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S.E. of difference of two
1. G marginal means = 41.0 lb./ac. 6. N means at the same level of G = 108.1 lb./ac.
2. N marginal means = 76.5 lb./ac. 7. G means at the same level of N = 102.2 lb./ac.
3. T or S marginal means = 41.1 lb./ac. 8. S or T means at the same level of G = 58.3 lb./ac.
4. S or T means at the same level of N = 82.4 lb./ac. 9. G means at the same level of S or T = 62.8 lb./ac.
5. N means at the same level of S or T = 101.8 lb./ac. S.E. of body of S x T table = 58.3 lb./ac.

Crop: Tobacco (Rabi).
Site: Hookah and Chewing Tobacco Res. Stn., Pusa.
Object: To study the effect of the manures and fertilizers in relation to trampling and spacing on the yield and quality of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
(i) (a) Maize—Rahar—Tobacco. (b) Maize—Rahar. (c) Nil. (ii) (a) Gangetic alluvium calcareous (b) N.A. (iii) 27.9.1956. (iv) (a) 1 ploughing by planet junior cultivator. (b) Transplanting. (c) 2 lb./ac. (d) As per treatments. (e) 1. (v) Nil. (vi) Bori Bhoroo—53 (medium). (vii) Irrigated. (viii) 6 weedings and hoeings, 9 suckerings and topping. (ix) 14.0", (x) 13.2.1957.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 55(18) on page 622.

5. RESULTS:
(i) 1929 lb./ac. (ii) (a) 977.7 lb./ac. (b) 387.3 lb./ac. (c) 279.3 lb./ac. (iii) Main effects of N, S and T are highly significant. (iv) Av. yield of cured leaf in lb./ac.
Crop: Tobacco (Rabi).  
Ref: C.T.R.I. 57(25).

Site: Hookah and Chewing Tobacco Res. Sta., Pusa.  
Type: ‘CM’.

Object: To study the effect of nitrogen fertilizers in combination with topping and spacing on the yield of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize+Rahar. (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. N.A. (iii) 12.9.1957, (iv) (a) 5 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) As per treatments. (e) I., (iv) 30 mds./ac. of F.Y.M. (v) Bori Bharao—10.  (vi) Irrigated. (vii) 1 weeding, topping and suckering. (viii) N.A. (x) 15.1.1958.

2. TREATMENTS:
   Main-plot treatments:
   4 levels of N: N_0 = 0, N_1 = 50, N_2 = 100 and N_3 = 150 lb./ac.
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 3 rates of topping: T_1 = 10, T_2 = 12 and T_3 = 14 leaves/plant.
   (2) 3 spacings between plant: S_0 = 2', S_1 = 2' and S_2 = 3'.

Spacing between rows is 3'. N applied half as A/S and half as mustard cake.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 15' x 30', (b) Plot size varies as per treatments. (v) One row around. (vi) Yes.

4. GENERAL:

5. RESULTS:
   (i) 677 lb/ac. (ii) (a) 241.4 lb./ac. (b) 212.1 lb./ac. (iii) Main effects of N, S and T are highly significant. (iv) Av. yield of cured leaf in lb./ac.

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<td>Mean</td>
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624
Crop :- Tobacco (Rabi).
Site :- Hookah and Chewing Tobacco Res. Stn., Pusa. Type :- 'CM'.

Object :- To study the effect of nitrogen fertilizers in combination with topping and spacing on the yield of Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 8.10.1958.
(iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) As per treatments. (e) I. (v) G.M. with sannhemp; top dressing with A/S and ground oat. (vi) D.F. --- 401. (vii) Irrigated. (viii) Weedings, topping and suckering. (ix) 19.1'. (x) 6.3.1959.

2. TREATMENTS to 4. GENERAL:
Same as in exp. no. 57(26) on page 624.

5. RESULTS:
(i) 2063 lb./ac. (ii) (a) 367.7 lb./ac. (b) 302.6 lb./ac. (iii) Main effects of N, T and S are highly significant.
(iv) Av. yield of cured leaf in lb./ac.

<table>
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<th>N2</th>
<th>N3</th>
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<td>2426</td>
<td>2063</td>
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S.E. of difference of two
1. N marginal means = 86.2 lb./ac.
2. S or T marginal means = 61.8 lb./ac.
3. S or T means at the same level of N = 123.5 lb./ac.
4. N means at the same level of T or S = 112.7 lb./ac.

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</table>
Crop :- Tobacco (Rabi).

Ref :- C.T.R.I. 59(37).

Site :- Hookah and Chewing Tobacco Res. Sta., Pusa. Type :- 'CM'.

Object :- To study the effect of nitrogen fertilizers in combination with topping and spacing on the yield of Tobacco.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Tobacco. (c) N.A. (iii) (a) Indo-gangetic alluvium calcareous. (c) N.A. (iii) 19.9.1959. (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) As per treatments. (e) 1. (f) F.Y.M. and top dressing with A/5 and mustard cake. (vi) D.P.— 401. (vii) Irrigated. (viii) 3 weedicings, topping and suckerings. (ix) 19.6°. (x) 16.2.1960.

2. TREATMENTS to 4. GENERAL :

   Same as in exp. no. 57(26) on page 124.

3. RESULTS :

   (i) 2558 lb./ac. (ii) (a) 119.7 lb./ac. (b) 30.1 lb./ac. (iii) Main effects of N, S and T are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N2</th>
<th>N1</th>
<th>S1</th>
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   S1 | 2712| 2976| 2959| 3045| 2923| 2862| 2782 | 3124 |
   S2 | 2377| 2443| 2683| 2752| 2564| 2350| 2797 | 2762 |
   S3 | 2039| 2156| 2235| 2324| 2188| 2002| 2167 | 2318 |
   Mean| 2376| 2525| 2625| 2707| 2558| 2405| 2509 | 2761 |

   S.E. of difference of two

   1. N marginal means = 75.4 lb./ac.
   2. S or T marginal means = 61.7 lb./ac.
   3. S or T means at the same level of N = 123.3 lb./ac.
   4. N means at the same level of S or T = 125.8 lb./ac.

---

Crop :- Tobacco.

Ref :- C.T.R.I. 54(46).

Site :- Central Tobacco Res. Sta., Rajahmundry. Type :- 'CM'.

Object :- To study the control of powdery mildew on Virginia Tobacco by application of sulphur to the soil.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Tobacco. (c) Nil. (ii) (a) Black clayey soil. (b) N.A. (iii) N.A./30.10.1954. (iv) (a) 2 to 3 ploughings. (b) Transplanting. (c) N.A. (d) 3尺 x 3尺 . (e) 1. (f) Broadcast 5 tons/ac. of M.C. (vi) Chatham, (Flue-cured). (vii) Irrigated. (viii) 2 to 3 weedicings after planting. Intercultivation with planet junior hoe twice during the first month of the crop. (ix) 0.35°. (x) 28.1.1955.

2. TREATMENTS :

   Main-plot treatments :
   3 levels of sulphur: S0 = 0, S1 = 40 and S2 = 80 lb./ac.

   Sub-plot treatments :
   2 times of application : T1 = about 6 weeks after planting and T1 = half about 6 weeks after planting + half 3 to 4 weeks later.

   Sub-sub-plot treatments :
   2 priming treatments : P0 = No pruning and P1 = Priming of tower leaves.
3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/replication; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 270' X 164' (60 plants/plot). (b) 22' X 11' (32 plants/plot). (v) 22' X 22'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Powdery mildew, control measures as per treatments. (iii) Observations on the six lower most leaves of every plant in each plot were taken. Each leaf was imagined to have been divided into 8 sections and each infected section, irrespective of the extent of infection was counted as one. The infected sections were counted on upper and lower surfaces of each leaf. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Yes.

5. RESULTS:
(i) 39.9 sections/plot. (ii) (a) 84.6 sections/plot. (b) 95.6 sections/plot. (c) 58.4 sections/plot. (iii) Main effect of S is significant. (iv) Av. number of sections/plot.

<table>
<thead>
<tr>
<th></th>
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<th>S1</th>
<th>S2</th>
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<td>4.5</td>
<td>39.9</td>
<td>42.7</td>
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</table>

SE of difference of two
1. S marginal means = 9.9 sections/plot. 6. P means at the same level of T = 23.8 sections/plot.
2. T marginal means = 27.6 sections/plot. 7. T means at the same level of P = 56.1 sections/plot.
3. P marginal means = 16.9 sections/plot. 8. T means at the same level of S = 47.8 sections/plot.
4. P means at the same level of S = 29.2 sections/plot. 9. S means at the same level of T = 63.8 sections/plot.
5. S means at the same level of P = 51.4 sections/plot.

Site: Central Tobacco Res. Inst., Rajahmundry. Type: 'M'.

Object: To find out the effect of inundating and G.M. with maize on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
(i) (a) Continuous tobacco. (b) Tobacco. (c) N.A. (ii) (a) Black soil. (b) N.A. (iii) N.A. 16.10.1954. (iv) (a) 4 ploughings with country plough. (b) Transplanted. (c) N.A. (d) 33' X 35'. (e) I. (v) As per treatments. (vi) Chathem (cigarette). (vii) Unirrigated. (viii) Hand weeding, interculturing and gap filling. (ix) 4.94". (x) 5.1.1955 to Feb., 1955.

2. TREATMENTS:
Main-plot treatments:
6 basal dressing treatments: B0=Control, B1=Inundation by burying (during kharif), B2=Inundation riding (during kharif), B3=Maize grown and buried, B4=Maize grown and cut and B5=Maize from (Be) buried.

Sub-plot treatments:
3 levels of N as A/S used as top dressing: N0=0, N1=20 and N2=40 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A (b) 1.70 cents. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Green leaf yield and total bright leaf equivalent. (iv) and (v) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 4653 lb./ac. (ii) (a) 63.32 lb./ac. (b) 54.24 lb./ac. (iii) Main effects of B and N are highly significant. (iv) Av. yield of green leaf in lb./ac.

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S.E. of difference of two
1. B marginal means = 211.1 lb./ac.
2. N marginal means = 127.8 lb./ac.
3. N means at the same level of B = 313.4 lb./ac.
4. B means at the same level of N = 331.5 lb./ac.

Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Inst., Rajahmundry. Type: 'CM'.

Object: To study the residual effect of maize and cumulative effect of water logging on 3 replications out of 6 of last year experiment.

1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) 23 and 40 lb./ac. of N as A/S was applied according to treatments in plough furrows in the year 1954—1955. (ii) (a) Deep black soil. (b) N.A. (iii) N.A./3 and 4.11.1955. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33"X33". (e) 1. (v) Nil. (vi) Harrison special (medium, cigarette). (vii) Irrigated. (viii) 4 hand weedings, 1 interculture with planet junior hoe and 1 with country plough. (ix) 0.12". (x) 12.1.1956 to 8.3.1956.

2. TREATMENTS:
   Same as in exp. no. 54(48) on page 627.

3. DESIGN:
   (i) Split-plot. (ii) 6 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 16'X71'. (b) 14'X65'. (v) 29'X31'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1954—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 4400 lb./ac. (ii) (a) 1175.6 lb./ac. (b) 425.7 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of green leaf in lb./ac.

<table>
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<th></th>
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S.E. of difference of two
1. B marginal means = 554.6 lb./ac.
2. N marginal means = 412.2 lb./ac.
3. N means at the same level of B = 348.3 lb./ac.
4. B means at the same level of N = 623.4 lb./ac.
Crop: Tobacco
Site: Central Tobacco Res. Inst., Rajahmundry
Ref: C.T.R.I. S5(20)

Object: To study whether row spacing of 4' will be helpful for intercultures, harvest and transport of leaf for general improvement of quality and to find out the optimum population and levels of 'N' at that row spacing.

1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) Nil. (ii) (a) Deep black soil. (b) N.A. (iii) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) As per treatments. (e) Nil. (vi) Harrison special (medium, cigarette). (vii) Unirrigated. (viii) 3 band weedings, 1 interculture with plant juncture and 1 with country plough. (ix) 6. 24'. (x) 7.3.1956 onwards.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 5 plant spacings: P1 = 33" x 33", P2 = 48" x 24", P3 = 48" x 18" and P4 = 48" x 15".
   (2) 2 levels of N as A/S: N1 = 20 and N2 = 40 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) 18" x 30". (b) Varying sizes. (v) N.A. (vi) Yes.

4. RESULTS:
   (i) 5135 lb./ac. (ii) 844.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of green leaf in lb./ac.

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<tr>
<th></th>
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S.E. of N marginal mean = 188.8 lb./ac.
S.E. of P marginal mean = 298.5 lb./ac.
S.E. of body of table = 422.2 lb./ac.
4. GENERAL:

(i) Normal. (ii) Nil. (iii) Periodical heiwbt
and (iv) number of leaves per plant at different
tages of crop growth. (v) Green, cured weight
of leaves and the proportion of different grades of cured
leaves. (vi) (a) 1951–1954. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Bright leaf equivalent

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S.E. of N marginal mean = 17.2 lb./ac.
S.E. of S marginal mean = 21.0 lb./ac.
S.E. of body of table = 42.1 lb./ac.

Green leaf

<table>
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<tr>
<th>S7</th>
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S.E. of N marginal mean = 139.5 lb./ac.
S.E. of S marginal mean = 170.8 lb./ac.
S.E. of body of table = 341.7 lb./ac.

Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'GM'.

Object:—To find out the optimum requirements of N, spacing and topping of cigarettes Tobacco.

1. BASAL CONDITIONS:

(i) (a) Tobacco after tobacco. (b) Tobacco. (c) As per treatments and M.C. at 5 C.L./ac. as basal dose.
(ii) (a) Heavy black soil. (b) N-A. (ii) 16.10.1954. (iv) (a) 4 ploughings with country plough. (b) Transplanted. (c) N-A. (d) As per treatments. (e) 1. (v) 100 lb./ac. of N as A/S. (vi) Chulham. (vii) Unirrigated. (viii) Gap-dilling, interculturing and hand weeding. (ix) 4.94'. (x) 5.10.1955 to the end of February, 1955.

2. TREATMENTS:

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S: N0 = 0, N1 = 20 and N2 = 40 lb./ac.
(2) 3 spacings: S1=33''×24'', S2=33''×28''' and S3=33''×32''.
(3) 3 topping and suckering treatments: T0=No operation, T1=Topping only and T2=Topping and suckering.
3. DESIGN.

(i) 3° confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 3, (iv) (a) 22'x151.5', (b) 165'x151.5'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Yield of green leaf and total bright leaf equivalent. (iv) (a) 1951 to 1954. (b) Yes. (c) Nil. (vi) (a) and (b) N.A. (vii) Nil.

5. RESULTS:

(i) 5495 lb./ac. (ii) 219.1 lb./ac. (iii) 5469 lb./ac. (b) 16.5'x51.5'. (v) N.A. (vi) N.A.

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S.E. of any marginal mean — 5.6 lb./ac.
S.E. of body of any table — 9.6 lb./ac.


Site: Central Tobacco Res. Instt., Rajahmundry. Type: ‘GM’.

Object: To promote better soil texture by deep tillage and incorporation of organic matter and conservation of moisture by mulching.

1. BASAL CONDITIONS:

(i) (a) Continuous Tobacco. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) N.A. (iii) N.A./13.11.1956. (iv) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 371/2x371/2. (e) 1. (f) 100 lb./ac. of A/S applied before planting in ploughed furrows. (g) Harrison Special (cigarette). (h) Unirrigated. (vii) 3 intercrops—2 with plant junior hoe and the third with H.M. Gannake. (ix) N.A. (x) 7.1.1957.

2. TREATMENTS:

Main-plot treatments: 5 manurial treatments (organic): T_0 = Control, T_1 = 5 tons/acre of paddy husk. T_2 = 5 tons/acre of tobacco stalk. T_3 = 6 C.L./acre of F.Y.M. and T_4 = Sanaifor G.M.

Sub-plot treatments: 2 manurial treatments (inorganic): F_1 = 20 lb./acre of N as A/S and F_2 = 20 lb./acre of N as A/S+100 lb./acre of P, O_3 as Super+100 lb./acre of K_2 O as Pot. Sul.

Sub-sub-plot treatments: 2 mulching treatments: M_0 = No mulching and M_1 = Artificial mulching with paddy straw.

3. DESIGN:

(i) Split-plt. (ii) (a) 5 main-plots/replication; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 5. (iv) (a) 271/2'x51 1/2'. (b) 220'x11'. (v) 24'x24'. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1956—1957. (c) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 5498 lb./ac. (ii) (a) 688.5 lb./ac. (b) 519.4 lb./ac. (c) 498.9 lb./ac. (iii) Main effects of T and M are highly significant. (iv) Av. yield of green leaf in lb./ac.
Crop: Tobacco (Rabi).  
Ref.: C.T.R.I. 57(27).  
Site: Central Tobacco Res. Instt., Rajahmundry.  
Type: 'CM'.

Object: To promote better soil structure by deep tillage and incorporation of organic matter and conservation of moisture by mulching with paddy straw.

1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A.  (iii) N.A./26.10.1957. (iv) (a) Crow-barring was done. Following incorporation of organic matter under treatment ploughing was given with iron mould plough. (b) Planted by rope. (c) N.A. (d) 33' x 33'. (e) 1.  
   (v) As per treatments. (vi) Harrison special (medium; flue cured cigarette). (vii) Unirrigated. (viii) Gap filling, one hand weeding and 2 interculturings with planet junior hoe. (ix) 1.18'. (x) 15.12.1957 to 25.2.1958.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 56(21) on page 631.

4. GENERAL:
   (i) Normal. (ii) Caterpillar attack was controlled by spraying DDT at 2 ozs./10 gallons of water. Eight weeks after planting spraying was done with Basudin against aphid attack. (iii) Yield of green leaf and total bright leaf equivalent. (iv) (a) 1956~1957. (b) Yes. (c) Nil. (v) to (viii) Nil.

5. RESULTS:
   (i) 7597 lb./ac.  
   (ii) (a) 788.2 lb./ac. (b) 548.7 lb./ac. (c) 635.9 lb./ac.  
   (iii) Main effect of T alone is highly significant. (iv) AV. yield of green leaf in lb./ac.

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**Crop**: Tobacco (Rabi).  
**Ref**: C.T.R.I. 58(45).  
**Site**: Central Tobacco Res. Inst., Rajahmundry.  
**Type**: ‘CM’.

**Object**: To study the effect of mulching with paddy straw right from the commencement of monsoon rains as compared to normal mulching done three weeks after planting on the yield and quality of cigarette Tobacco under crow barring and normal ploughing.

1. **BASAL CONDITIONS**:
   (i) (a) Continuous Tobacco. (b) Tobacco. (c) 20 lb./ac. of N as A/S.
   (ii) 1 (a) Deep black soil. (b) N.A.  
   (iv) 1a) As per treatments. (b) Transplanting. (c) N.A. (d) 33” x 33”.
   (v) 1. (vi) Harrison special (medium; five cured cigarette). (vii) Unirrigated. (viii) Gap filling 3 times. 2 band weeding and 2 intercultures were done with planet junior hoe. (ix) 7.23”. (x) 20.1.1958 to 5.3 1958.

2. **TREATMENTS**:
   **Main-plot treatments**:  
   2 cultural treatments: C1 = Hand digging with crow bar in summer and C2 = Normal ploughings (3 ploughings with country plough and 2 harrowings with blade harrow).
   **Sub-plot treatments**:  
   4 mulching treatments: M0 = No mulching, M1 = Mulching with paddy straw at the onset of monsoons, M2 = Mulching with paddy straw soon after the 1st interculture with planet junior hoe about 3 weeks after planting and M3 = M1 + M2.
   During the 3rd week of June mulching was done with paddy straw at 3200 lb./ac. under M1 and M3 treatment plots. During the 2nd week of December mulching was done at 3200 lb./ac. under M2 and M3 plots.

3. **DESIGN**:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 4 sub-plots/main-plot.  
   (b) N.A. (iii) 4. (iv) (a) 22.0" x 19.2". (b) 16.1" x 13.75". (v) (a) & (b) Nil.  
   (vi) Yes.

4. **GENERAL**:
   (i) Due to heavy rains in February, considerable amount of lodging took place and quite a good no. of curable leaves were spoiled. The crop growth was normal. (ii) Spraying was done with DDT against caterpillar attack and with Basudin against aphids attack (DDT at 2 ozs. and Basudin at 1 oz. in 10 gallons of water). (iii) Yield of green leaf.  
   (iv) (a) 1958—N.A.  (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Due to heavy rains and river floods the complete experimental area was submerged under 6" of water for a considerable time during 1st and 2nd week of September. (vii) Nil.

5. **RESULTS**:
   (i) 7802 lb./ac.  
   (ii) (a) 7Q8.2 lb./ac.  
   (b) 485.9 lb./ac. (iii) Main effect of Malone is highly significant. (iv) Av. yield of green leaf in lb./ac.

<table>
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S.E. of difference of two
1. C marginal means = 250.4 lb./ac.
2. M marginal means = 243.0 lb./ac.
3. M means at the same level of C = 343.6 lb./ac.
4. C means at the same level of M = 388.9 lb./ac.

Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'CM'.

Object: To study the effect of deep ploughing in summer, incorporation of organic matter in the soil, mulching and topping on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) 3 tons/ac. of F.Y.M. (ii) (a) Deep black soil. (b) N.A. (iii) N.A./5 to 7.11.1958. (iv) (a) 3 ploughings with country plough and 2 harrowings with plain blade barrow. (b) Transplanting. (c) N.A. (d) 35° x 35°. (e) 1. (f) 3 tons/ac. of F.Y.M. + 100 lb./ac. of A/S. (vi) Harrison special (medium). (vii) Unirrigated. (viii) Twice gap-filling, 2 hand weedicings, 2 intercultures with planet junior hoe to the whole exp. and with teeth harrow to plots under 'No mulching' treatment. (ix) N.A. (x) 19.1.1959 to 10.3.1959.

2. TREATMENTS:

   Main-plot treatments: C1 = Crow barring in summer and C2 = Normal ploughing.

   Sub-plot treatments:
   4 mulching treatments: M0 = No mulching (control), M1 = Mulching with alfathene after the 1st post planting interculture, M2 = Mulching with paddy straw after the 1st post planting interculture, and M3 = Mulching with paddy straw at the beginning of monsoon + mulching with alfathene after the 1st post planting interculture.

3. DESIGN:

   (i) Split-plot. (ii) 2 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 22.0' x 19.25'. (iv) Yes.

4. GENERAL:

   (i) Normal. (ii) Caterpillar attack—Endrin sprayed thrice at 2 oz./10 gallons. Hand picking was done twice. Orobanche—removed by hand. (iii) Yield of green leaf. (iv) (a) 1958—contd. (b) Yes, (c) Nil, (d) and (e) Nil. (vii) The experimental site was submerged under water for about a fortnight.

5. RESULTS:

   (i) 6788 lb./ac. (ii) 460.8 lb./ac. (iii) 513.5 lb./ac. (iv) Main effects of C and M are highly significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>M0</th>
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<td>Mean</td>
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<td>6580</td>
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</table>

   S.E. of difference of two
   1. C marginal means = 162.9 lb./ac.
   2. M marginal means = 256.8 lb./ac.
   3. M means at the same level of C = 365.1 lb./ac.
   4. C means at the same level of M = 354.2 lb./ac.
2. TREATMENTS:

Main-plot treatments:
5 deep ploughing treatments with tractor in summer: P₀ = No tractor ploughing. P₁ = Every year, P₂ = Once in 2 years, P₃ = Once in 3 years and P₄ = Once in 4 years.

Treatments in 1st split:
2 mulching treatments: M₀ = No mulching and M₁ = Mulching with paddy straw at 3 C.L./ac.

Treatments in 2nd split:
4 manural treatments: F₁ = 20 lb./ac. of N as Ammonium nitrate, F₂ = F₁ + 100 lb./ac. of P₂₀ as Super, F₃ = F₁ + 100 lb./ac. of P₂₀ as Super + 100 lb./ac. of K₂O as Pot. Sul.

Treatments in 3rd split:
3 levels of MgO as Mag. Sul.: G₀ = 0 and G₁ = 20 lb./ac.

Treatments in 4th split:
4 types of compost at 3 tons/ac.: C₁ = Tobacco stalk and C₂ = F.Y.M. or M.C.

Treatments in 5th split:
2 topping treatments: T₀ = No topping and T₁ = Topping when 1/10th inflorescence emerges.

Main-plot treatments started with 1st ploughing in summer, 1958.

3. DESIGN:

(i) Split-plot (ii) (a) 5 main-plots/replication, 4 plots/1st split, 2 plots/2nd split, 2 plots/3rd split, 2 plots/4th split and 2 plots/5th split. (b) N.A. (iii) 3. (iv) (a) 24.75' × 19.25'. (b) 19.25' × 13.75'. (v) 21' × 21'. (vi) Yes.

4. GENERAL:

(i) Due to heavy rains in February, the crop was considerably lodged. (ii) Spraying was done with DDT against caterpillar attack and with Basudin against aphids. Peculiarly the caterpillar persisted until the capsule bearing stage and caused much damage to curable leaves. (iii) Yield of green leaf. (iv) (a) 1958—contd. (modified in 1959). (b) No. (c) Nil. (v) (a) Guntur. (b) Nil. (vii) Heavy rains. (viii) Due to heavy rains following 1st planting, many plants got either submerged or buried under wet soil, as a consequence of which the experiment was completely replanted after one week. Two-way tables of means—N.A.

5. RESULTS:

(i) 5900 lb./ac. (ii) 3270 lb./ac. (b) 2104 lb./ac. (c) 1620 lb./ac. (d) 1023 lb./ac. (e) 665.7 lb./ac. (f) 653.3 lb./ac. (iii) Main effects of M, C and T are highly significant. (iv) Av. yield of green leaf in lb./ac.

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<th>Treatment</th>
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<th>P₁ + P₂ + P₃ + P₄</th>
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S.E. of difference of two

1. F marginal means
2. M marginal means
3. F marginal means
4. G marginal means
5. C marginal means
6. T marginal means

Crop: Tobacco (Rabi).
Ref: C.T.R.I. 59(39).
Site: Central Tobacco Res. Inst., Rajahmundry. Type = ‘CM’.
Object: To study the effect of deep ploughing, fertilizers and bulky organic manures on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:

(i) (a) Continuous tobacco. (b) Tobacco. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) N.A., 9.11.1959. (iv) (a) As per treatments. (b) Transplantation. (c) N.A. (d) 33° × 33°. (e) 1. (v) As per treatments. (vi) Harrison special (medium). (vii) Unirrigated. (viii) N.A. (ix) Nil. (x) 11.1.1960 to 2.3.1960.
2. TREATMENTS:

Main plot treatments:
- 5 deep ploughing treatments with tractor in summer: P0 = No tractor ploughing, P1 = Every year, P2 = Once in 2 years, P3 = Once in 3 years and P4 = Once in 4 years.

Treatments in 1st split:
- 4 manurial treatments: F1 = 20 lb./ac. of N as A/S, F2 = F1 + 100 lb./ac. of P2O5 as Super, F3 = F1 + 100 lb./ac. of K2O as Pot. Sul. and F4 = F1 + 100 lb./ac. of P2O5 as Super + 100 lb./ac. of K2O as Pot. Sul.

Treatments in 2nd split:
- 2 levels of MgO as Mag. Sul.: G0 = 0 and G1 = 20 lb./ac.

Treatments in 3rd split:
- 2 types of compost at 3 tons/ac.: C1 = Tobacco stalk and C2 = F.Y.M.

Treatments in 4th split:
- 2 mulching treatments: M0 = No mulching and M1 = Mulching with paddy straw at 3 C.L./ac.

3. DESIGN:

(i) Split-plot. (ii) 5 main-plots/replication, 4 plots/1st split, 2 plots/2nd split, 2 plots/3rd split and 2 plots/4th split. (b) N.A. (iii) 19.25'×24.75'. (iv) 21'×24'. (v) Yes. (vi) Nil. (vii) Nil. (viii) Yes.

GENERAL:

(i) Satisfactory. (ii) Caterpillar attack—caterpillars were removed. Endrin sprayed at 2 oz./100 gallons of water. Aphids attack—Basudin sprayed at 2 oz./10 gallons of water. Orobanche—removed. (iii) Yield of green leaf. (iv) (a) 1958—contd. (modified in 1959). (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) The entire experimental site remained submerged for several days.

5. RESULTS:

(i) 4614 lb./ac. (ii) 2617 lb./ac. (b) 926.4 lb./ac. (c) 684.3 lb./ac. (d) 492.1 lb./ac. (e) 485.2 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of green leaf in lb./ac.

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<tr>
<th></th>
<th>F1</th>
<th>F2</th>
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<th>G0</th>
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S.E. of difference of two
1. P0 or P1 with (P2 + P3 + P4) marginal means = 308.4 lb./ac.
2. P0 with P2 marginal means = 377.7 lb./ac.
3. F marginal means = 119.5 lb./ac.
4. G marginal means = 62.4 lb./ac.
5. C marginal means = 45.0 lb./ac.
6. M marginal means = 44.3 lb./ac.
Crop: Tobacco (Rabi).


Site: Central Tobacco Res. Instt., Rajahmundry. Type = ‘CM’.

Object: To study the direct effect of topping and residual effect of 4 years continuous application of Nitrogen.

1. BASAL CONDITIONS:
   (i) (a) Continuous tobacco. (b) Tobacco. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A. (iii) N.A./I.I.11.1955. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 33" x 33", (e) L. (vi) Nil. (vii) Harrison special (medium, cigarette). (viii) Unirrigated. (ix) 2 hand weedings, 2 intercultures with planet junior hoe and 1 with country plough. (x) 0.034. (x) 28.1.1956 to 6.3.1956.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
   (2) 3 numbers of leaves/plant (pruned): L₀ = 16, L₁ = 19 and L₂ = 22 leaves.
   (3) 3 topping treatments: T₀ = Control, T₁ = As and when ready and T₂ = Removal of remaining leaves and flowers, without topping.

N applied as A/S from 1951 to 1954 to study the residual effect.

3. DESIGN:
   (i) 3 confd. (ii) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) 22" x 49". (v) 21' x 21'. (vi) Yes

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) (a) 1955—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 376 lb./ac. (ii) 252.8 lb./ac. (iii) Main effects of N, L, T and interactions N x L, L x T and N x L x T are significant. (iv) Av. yield of green leaf in lb./ac.

<table>
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<th>N₀</th>
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<th>N₂</th>
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S.E. of any marginal mean = 59.6 lb./ac.
S.E. of body of any table = 103.2 lb./ac.

Crop: Tobacco.


Site: Cigar and Cheroot Tobacco Res. Stn., Vedasandur. Type = ‘CM’.

Object: To find out the optimum period of planting and optimum topping and levels of N on cigar Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cambic (Ponneticete typhoides) (c) Nil. (d) (a) Red loam. (b) N.A. (iii) As per treatments. (iv) (a) 5 ploughings. (b) Transplanting. (c) N.A. (d) 2.5' x 2'. (e) L. (v) 10 C.L./ac. of F.Y.M. (vi) Vellai vazhai (Nicotiana tabacum). (vii) Irrigated. (viii) 2 hand weedings, 1 hoeing, suckers and orobanchie removed and topping as per treatments. (ix) 17.84". (x) 28.1.1955 to 6.3.1956.
2. **TREATMENTS:**

Main-plot treatments:
- All combinations of (1) and (2)
  1. 2 levels of N: N₁ = 0 and N₂ = 100 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio.
  2. 2 levels of topping: T₁ = Leaving 14 leaves per plant and T₂ = Leaving 16 leaves per plant.

Sub-plot treatments:
- G.N.C. applied in two equal doses one at planting and the other at the time of hoeing while A/S applied in two equal doses one at the time of hoeing and the other a week before topping.

3. **DESIGN:**
- (i) Split-plot.
- (ii) (a) 4 main-plots/replication; 8 sub-plots/main-plot. (b) N.A.
- (iii) 4, (iv) 12.5' x 14.5'.
- (v) 1 row around as border. (vi) Yes.

4. **GENERAL:**
- (i) Normal. (ii) Regular spraying with DDT was done as precautionary measures against leaf eating caterpillar and stem borer.
- (iii) Yield of tobacco. (iv) (a) 1952-1954. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**

<table>
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<tr>
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<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
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S.E. of difference of two:
1. N or T marginal means = 65.1 lb./ac.
2. D marginal means = 77.8 lb./ac.
3. D means at the same level of N or T = 110.5 lb./ac.
4. N or T means at the same level of D = 121.7 lb./ac.

- **Crop:** Tobacco.  
- **Site:** Cigar and Cheroot Tobacco Res. Stn., Vedasandur.  
- **Type:** 'CM'.

Object: To study the effect of different levels of spacing, topping and manuring on the yield and quality of cigar Tobacco.

1. **BASAL CONDITIONS:**
- (i) Tobacco—Cumbu. (b) Cumbu (Pennisetum typhoides). (c) Nil. (d) (ii) (a) Red loam. (b) N.A. (iii) 30.10.1954. (iv) (a) 4 ploughings. (b) Transplanting. (c) and (d) As per treatments. (e) i. (v) Nil. (vi) Vellavazhai (Nicotiana tabacum). (vii) Irrigated. (viii) 1 band weeding, 1 hoeing, sucker and orobanche removed and topping as per treatments. (ix) 6.23'. (x) 3.2.1955 to 6.2.1955.

2. **TREATMENTS:**
- All combinations of (1), (2) and (3)
  1. 2 levels of manuring: M₁ = 40 C.L./ac. of F.Y.M. and M₂ = 20 C.L./ac. of F.Y.M. + 100 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio.
  2. 2 spacings: S₁ = 30' x 20' (10454 plants/ac.) and S₂ = 30' x 24' (8712 plants/ac.).
  3. 2 levels of topping: T₁ = Leaving 12 leaves and T₂ = Leaving 14 leaves.
3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) N.A. (iii) 6. (iv) (a) $22.5' \times 17.5'$. (b) $17.5' \times 11.75'$ for $S_1$ and $17.5' \times 12.00'$ for $S_2$. (v) One row around. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Regular spraying in the initial stages with DDT as a precautionary measure against leaf caterpillar (*Prodenia litura*) and stem-borer and 2 to 3 sprayings in later stages with tobacco decoction against aphids were done. (iii) Yield of tobacco. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) $2221 \text{ lb./ac.}$ (ii) $234.0 \text{ lb./ac.}$ (iii) Main effects of $M$ and $T$ are highly significant while that of $S$ is significant. (iv) Av. yield of cured leaf in lb./ac.

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S.E. of any marginal mean = 47.7 lb./ac.
S.E. of body of any table = 67.6 lb./ac.

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**Crop :- Tobacco.**

**Ref :- C.T.R.I. 55(20).**

**Site :- Cigar and Cheroot Tobacco Res. Stn., Vedasandur. Type :- 'CM'.**

Object :- To study the effect of different levels of spacing, topping and manuring on the yield and quality of cigar Tobacco.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Cumbu. (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) 15.11.1935. Gaps filled on 26.11.1935 and 6.12.1955 (total gaps 70, 3.2%). (iv) (a) 4 ploughings. (b) Transplanting. (c) and (d) As per treatments, (e) Nil. (v) Nil. (vi) Vellaravzhai. (vii) Irrigated. (viii) 1 hand weeding, 1 hoeing and earthing up. (ix) N.A. (x) 28.2.1956 to 2.3.1956.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 54(53) on page 638.

4. GENERAL:
(i) Poor. (ii) Negligible attack of borer and virus. Crop badly affected by aphids inspite of repeated sprayings of Endrine and tobacco decoction. (iii) Yield of cured leaves. (iv) (a) 1952—1955. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Commencement of monsoon was late. (vii) Nil.

5. RESULTS:
(i) $2053 \text{ lb./ac.}$ (ii) $149.6 \text{ lb./ac.}$ (iii) Main effects of $M$ and $T$ are highly significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
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<th></th>
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Crop: Tobacco.  
Ref: C.T.R.I. 54(54).  
Site: Cigar and Cheroot Tobacco Res. Stn., Vedasandur.  
Type: 'CM'.

Object: To find out the optimum planting period, optimum topping and levels of N for chewing Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Comba (Pennisetum typhoides). (c) Nil. (ii) (a) Red loam. (b) N.A. (iii) As per treatments.
(iv) (a) 3 ploughings. (b) Transplanting. (c) N.A. (d) 2.5' x 2'. (e) 1. (f) 10. C L/acre. of F.I.M. (v) Valmanai (Nicotiana tobacum). (vi) Irrigated. (vii) 2 weedings, 1 hoeing, 1 earthing up, suckers and oronchicago removal and topping as per treatments. (ix) 13.31'. (x) 4.2.1955 to 31.3.1955.

2. TREATMENTS:
Main-plot treatments: All Combinations of (1) and (2)
(1) 2 levels of N: N4 = 0 and N1 = 100 lb./acre. of N as A/S and G.N.C. in 1: 1 ratio.
(2) 2 levels of topping: T1 = Leaving 14 leaves per plant and T2 = Leaving 16 leaves per plant.
G.N.C. applied in two equal doses prior to planting and at hoeing and earthing up. 6 weeks after planting as top dressing A/S applied in two equal doses prior to hoeing and earthing up and one week prior to topping as top dressing.

3. DESIGN:
(i) (a) Split-plot. (ii) (a) 4 main-plots/replication and 8 sub-plots/main-plt. (b) N.A. (iii) 4. (iv) (a) 21' x 14'. (b) 15' x 10'. (v) One row all round. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Regular spraying with DDT 5% was done as a precautionary measure against leaf eating caterpillar and stem borer. (iii) Yield of tobacco. (iv) (a) 1952-1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 133 lb./acre. (ii) (a) 384 lb./acre. (b) 217.0 lb./acre. (iii) Main-effects of N and D are highly significant. (iv) Av. yield of cured leaf in lb./ acre.

<table>
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S.E. of difference of two
1. N or T marginal means = 67.9 lb./acre.
2. D marginal means = 76.7 lb./acre.
3. D means at the same level of N or T = 108.5 lb./acre.
4. N or T means at the same level of D = 122.1 lb./acre.
Crop :- Tobacco.  
Site :- Cigar and Cheroot Tobacco Res. Sta., Vedasandur.  
Type :- 'CM'.

Object :- To find out the optimum planting period, optimum topping and levels of N on chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) As per treatments. (iv) (a) 4 ploughings. (b) Transplanting. (c) 8712 plants/ac. (d) 30" x 24". (e) (v) 10 C.L. of F.Y.M. (vi) Mannai. (vii) Irrigated. (viii) Weeding, hoeing, muminati digging, earthing up and topping. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 2 levels of N: N0 = 0 and N1 = 100 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio.
   (2) 2 levels of topping: T1 = Leaving 14 leaves per plant and T2 = Leaving 16 leaves per plant.

   Sub-plot treatments:

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication and 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A (b) 1/294.1 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of cured leaf. (iv) (a) 1952–1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Commencement of monsoon was late. (vii) Nil.

5. RESULTS:
   (i) 1622 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of cured leaf in lb./ac.

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Crop :- Tobacco.  
Site :- Cigar and Cheroot Tobacco Res. Sta., Vedasandur.  
Type :- 'CM'.
2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 2 levels of manuring: M₁=40 C.L./ac. of F.Y.M. and M₂=20 C.L./ac. of F.Y.M.+100 lb./ac. of N as A/S and G.N.C. in 1:1 ratio.
(2) 2 spacings: S₁=30"x20" (10450 plants/ac) and S₂=30"x24" (8742 plants/ac)
(3) 2 levels of topping: T₁=Leaving 10 leaves and T₂=Leaving 14 leaves.
F.Y.M. broadcast one month before transplanting.
G.N.C. broadcast at planting and A/S top dressed 6 weeks after planting.
3. DESIGN:
(i) Fast. in R.R.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 23'x23'. (b) 20'x16' for S₁ and 20'x16' for S₂. (v) One row around. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nothing noteworthy. Regular spraying with DDT 550 was done as a safeguard against leaf eating caterpillars and stem borer. (iii) Yield of tobacco. (iv) (a) 1952-1956. (b) Yes. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 2323 lb./ac. (ii) 199.0 lb./ac. (iii) Main effects of M and S are highly significant. Interaction S×T is significant. (iv) Av. yield of cured leaf in lb./ac.

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S.E. of any marginal mean = 40.6 lb./ac.
S.E. of body of any table = 57.4 lb./ac.

Crop : Tobacco. 
Site : Cigar and Cheroot Tobacco Res. Sta., Vedasandur. 
Type : 'CM'.
Object : To study the effect of different levels of spacing, topping and manuring on the yield and quality of chewing Tobacco.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Red loam. (b) N.A. (iii) N.A. (iv) (a) 4 ploughings. (b) Transplanting. (c) and (d) As per treatments. (e) One. (f) Nil. (vi) Manured. (vii) Irrigated. (viii) Weeding and hoeing, minimum digging and earthing up. Topping as per treatments. (ix) and (x) N.A.
2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 54(55) on page 641.
4. GENERAL:
(i) The crop in general, was poor in patches and hence not uniform in growth. (ii) Heavy infestation of arabache. (iii) Yield of cured leaf. (iv) (a) 1952-1956. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Commencement of monsoon was late. (vii) Nil.
5. RESULTS:
(i) 2793 lb./ac. (ii) 215.0 lb./ac. (iii) Main effects of M and S are highly significant. (iv) Av. yield of cured leaf in lb./ac.
Crop: Tobacco.  
Ref: C.T.R.I. 56(5).

Site: Cigar and Cheroot Tobacco Res. Sta., Vedassandur. Type: 'CM'.

Object: To study the effect of different levels of spacing, trellising and harvesting on the yield and quality of chewing Tobacco.

1. BASAL CONDITIONS:
(i) to (c) N.A. (ii) Red loam. (b) N.A. (iv) (a) Ploughing. (c) and (d) As per treatments. (e) 1. (v) Nil. (vi) Munmuti digging and earthing up and topping as per treatments. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 54(5) on page 641.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of cured leaf. (iv) (a) 1952—1956. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vii) Excessive rains in the month of October. (vii) Nil.

5. RESULTS:
(i) 2444 lb./ac. (ii) 106.3 lb./ac. (iii) Main effects of M, S, T and interaction M×S are highly significant.
(iv) Av. yield of cured leaf in lb./ac.

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S.E. of any marginal mean = 21.7 lb./ac.
S.E. of body of any table = 30.7 lb./ac.

Crop: Tobacco (Rabi).
Ref: C.T.R.I. 56(22).

Site: Central Tobacco Res. Inst., Rajahmundry. Type: 'ICM'.

Object: To study the effect of irrigation, manuring and topping on the yield and quality of cigarette Tobacco.
1. BASAL CONDITIONS:
(i) (a) Continuous tobacco. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) N.A. (iii) 21.11.1956.
(iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) $33^\circ \times 33^\circ$. (e) T. (v) 100 lb./ac. of A/S applied before transplanting in ploughed furrows. (vi) Harrison special (medium). (vii) Irrigated.
(viii) 1 interculture with country plough and 1 with planet junior hoe. (ix) 1.4'. (x) 7 primings from 25.1.1957 to 15.3.1957.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(I) 2 levels of irrigation : $I_0=$No irrigation and $I_1=2$ irrigations, 4 weeks and 7 weeks after transplantation.
(2) 2 levels of manuring : $M_0=20$ lb./ac. of N at A/S and $M_1=N$ at 20 lb./ac. as $A/S+P_O_5$ at 100 lb./ac. as Super+$K_2O$ at 100 lb./ac. as Pot. Sul.
(3) 2 levels of topping : $T_0=$No topping and $T_1=$Topping.

3. DESIGN:
(i) 23 fact. confd. (ii) (a) 4 plots/block; 2 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 19'3'x55'. (b) 19'9"x 19'6". (v) 1 row of 33" width around each plot. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of green leaf. (iv) to (vii) Nil.

5. RESULTS:
(i) 7394 lb./ac. (i) 676.6 lb./ac. (iii) Main effect of I is highly significant. (iv) Av. yield of green leaf in lb./ac.

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S.E. of any marginal mean = 239.2 lb./ac.
S.E. of body of any table = 338.3 lb./ac.

Crop: Tobacco (Rabi).
Ref: C.T.R.I. 57(28).
Site: Central Tobacco Res. Instit., Rajahmundry. Type: 'ICM'.
Object: To study the effect of irrigation in combination with fertilizers and topping on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
(i) (a) Tobacco after tobacco. (b) Tobacco. (c) Manural exp. was conducted during 1955 and 1956. Treatments included, no manure, F.Y.M. at 5 tons/ac., paddy husk and paddy straw at 10 tons/ac. (ii) (a) Deep black soil. (b) N.A. (iii) 12.11.1957. (iv) (a) 2 ploughings with country plough and 1 harrowing. (b) Planted by rope. (c) N.A. (d) $33^\circ \times 33^\circ$. (e) T. (f) Nil. (g) Harrison special (medium). (h) Irrigated.
(viii) Gap-filling and pot watering during the week after planting. 1 weeding and 2 interculturings. Su. kerung after topping done periodically. (ix) 2.6'. (x) 6 primings from 5.2.1958 to 18.3.1958.

2. TREATMENTS:
Main-plot treatments:
8 levels of irrigation : $I_0=$No irrigation, $I_1=4, I_2=7, I_3=9, I_4=4$ and 7, $I_5=7$ and 9, $I_6=4$ and 9 and $I_7=4, 7$ and 9 weeks after planting.

Sub-plot treatments:
2 levels of fertilizers : $M_2=20$ lb./ac. of N as A/S and $M_3=M_1+100$ lb./ac. of P$_O_5$ as Super+$K_2O$ as Pot. Sul.
Sal>nb-piGI tr.,.t....,ts
T0 = No topping and T1 = Topping at flowering.
Fertilizers applied by hand in furrows.

3. DESIGN:
(i) Split-plot. (ii) (a) 8 main-plots/trial; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A.
(iii) 2'. (iv) (a) 2' x 16.5', (b) 16.5' x 11'. (v) 2' x 2'. (vi) Yes.

4. GENERAL:
(i) Split-plot. (ii) (a) 8 main-plots/trial; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A.
(iii) 2'. (iv) (a) 2' x 16.5', (b) 16.5' x 11'. (v) 2' x 2'. (vi) Yes.

5. RESULTS:
(i) 9965 lb./ac. (ii) (a) 1917.9 lb./ac. (b) 1293.4 lb./ac. (c) 1032.6 lb./ac. (iii) Main effects of I and M are highly significant. (iv) Av. yield of green leaf in lb./ac.

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<td>7476</td>
<td>8406</td>
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<td>10172</td>
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<td>10565</td>
<td>12134</td>
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<tr>
<td>7650</td>
<td>8235</td>
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<td>12401</td>
<td>10227</td>
<td>11110</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. I marginal means
2. M marginal means
3. T marginal means
4. M means at the same level of I
5. I means at the same level of M
6. T means at the same level of I
7. I means at the same level of T
8. T means at the same level of M
9. M means at the same level of T
10. I means at the same level of M

Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'ICM'.
Object: To study the effect of irrigation in combination with fertilizers and topping on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
(i) (a) Tobacco after Tobacco. (b) Tobacco. (c) As per treatments. (ii) (a) Deep black soil. (b) N.A.
(iii) 31.10.1958. (iv) (a) Four ploughings with country plough. (b) Transplanting. (c) N.A. (d) 3' x 33'.
(e) 1. (v) 3 tons/ac. of M.C. (vi) Harrison special (medium). (vii) Irrigated. (viii) GAP filling, 2 hand weeding, 3 intercultures with planet junior hoe, 1 interculture with hand hoe and suckering following topping. (ix) 11.6'. (x) 5 primings from 6.1.1959 to 18.2.1959.

2. TREATMENTS and 3. DESIGN:
Same as in expb. no. 57(28) on page 644.

4. GENERAL:
(ii) Lodging in February due to heavy rains. (ii) Caterpillar attack—hand picking and destroying of caterpillars, spraying DDT at 2 oz. in 10 gallons of water, suspicion of root knots—drenching with Bordeaux mixture. Orbanza removed and burned. (iii) Yield of green leaf. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains. (vii) Due to heavy rainfall in early stages of the crop, irrigations 4 weeks after planting was cancelled. Thus there were only 4 effective irrigational treatments.

5. RESULTS:
(i) 910 lb./ac. (ii) (a) 1104.5 lb./ac. (b) 599.1 lb./ac. (c) 1008.4 lb./ac. (iii) Main effect of I's highly significant and main effect of T is significant. (iv) Av. yield of green leaf in lb./ac.
Ref: C.T.R.I. 59(40).

Object—To study the effect of irrigation in combination with fertilizers and topping on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) Tobacco after Tobacco. (b) Tobacco. (c) 3 tons/ac. of F.Y.M + fertilizers as per treatments. (ii) (e) Deep black soil (b) N.A. (iii) 6.11.1959. (iv) (a) 4 ploughings with country plough. (b) Transplanting. (c) N.A. (d) 3'×3' (e) 1. (f) F.Y.M at 3 tons/ac. (g) Harrison special (medium). (h) 2 gap fillings, 4 hand weedings, 2 inter-culltures with planters junior hoe. Removal of sand leaves and suckering done in topped plots 4 times. (i) Nil. (j) 6 prunings from 8.1.1959 to 23.2.1960.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 57(28) on p. 644.

4. GENERAL:
   (i) Normal. (ii) Caterpillar attack—twice hand picking and destroying, spraying Endrine at 2 oz in 10 gallons of water twice. Aphids attack Basudoo sprayed once at 2 oz in 10 gallons of water. Powdery mildew sulphur applied in row at 25 lb/ac. by mixing with sand. Orostachne removed. (iii) Yield of green leaf. (iv) (a) 1957—1959. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 8130 lb/ac. (ii) (a) 1144.7 lb/ac. (b) 823.2 lb/ac. (c) 760.2 lb/ac. (iii) Main effect of I and M are highly significant. Interaction I×M×T is significant. (iv) Av. yield of green leaf in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M₁</td>
<td>7849</td>
<td>7941</td>
<td>7955</td>
<td>8131</td>
</tr>
<tr>
<td>M₂</td>
<td>8120</td>
<td>8060</td>
<td>8201</td>
<td>8247</td>
</tr>
</tbody>
</table>

S.B. of difference of two
1. I marginal means = 318.8 lb/ac. 6. T means at the same level of I = 411.7 lb/ac.
2. M marginal means = 203.9 lb/ac. 7. I means at the same level of T = 431.7 lb/ac.
3. T marginal means = 203.9 lb/ac. 8. T means at the same level of M = 291.1 lb/ac.
4. M means at the same level of I = 429.9 lb/ac.
5. I means at the same level of M = 429.9 lb/ac.

"Crop: Tobacco (Rabi)."
Crop :- Tobacco. 
Site :- Tobacco Res. Sta., Hansar.  
Type :- 'D'.

Object :- To study the effect of insecticides to control the stem borer in the nursery of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (c) Nil. (b) Tobacco. (c) Nil. (ii) (a) Red sandy loam. (b) N.A. (iii) 10.8.1958. (iv) (a) Ploughing 3 to 4 times. (b) Transplanting. (c) 3 lb./ac. (d) 33'x33'. (e) N.A. (v) F.Y.M. at 20 tons/ac + A/S at 16 grams/bed. (vi) Unirrigated. (vii) Thinning and gap filling. (viii) 7.46'. (ix) 12.11.1958.

2. TREATMENTS:
   6 insecticidal sprayings: T0 =Control (no spray), T1 =Bauadin 20 E.C. 0.15%, T2 =Endren 20 E.C. 0.10%, T3 =Ekatox 20 E.C. 0.25% and T4 =Folidol 65 E. 0.03%.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 30 plants. (v) Nil. (vi) Yes.

5. RESULTS:
   (i) 8.9%. (ii) 5.28%. (iii) Treatment differences are not significant. (iv) Mean incidence of stem borer in percentage.

   Treatment | T0 | T1 | T2 | T3 | T4 |
   10.93 | 4.58 | 8.88 | 11.43 |

S.E./mean = 2.64%
4. GENERAL:

(i) Fair. (ii) As per treatments. (iii) Lab count on aphid mortality in 5 random infested leaves. Field count of affected plants and % decrease in aphid infested leaves taken 15 days after spraying. (iv) (a) 1958-1960. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 68.34%, (ii) 15.19%. (iii) Treatment differences are highly significant. (iv) Mean % of decrease in aphids infestation.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean %</td>
<td>29.26</td>
<td>41.98</td>
<td>82.76</td>
<td>79.22</td>
<td>87.96</td>
<td>88.88</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Tobacco. Site: Tobacco Res. Sta., Hansur. Object: To find out the effect of different insecticides to control the aphids on Tobacco.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Tobacco. (c) Nil. (ii) (a) Red sandy loam. (b) N.A. (iii) 9.8.1959. (iv) (a) 4 ploughings. (b) Transplanting. (c) 3 lb./ac. (d) 33"x33". (e) N.A. (f) Nil. (v) Nil. (vi) Flue cured virginia tobacco. (vii) Unirrigated. (viii) Nil. (ix) 12" in 21 days. (x) 10.10.1959.

2. TREATMENTS:

7 insecticidal treatments: T0=Control (no spray), T1=Water spraying, T2=Basaric 20 E.C. 0.15%, T3=Ektex 20 E.C. 0.10%, T4=Endrex 20 E.C. 0.25%, T5=Folithol 655 E 0.03% and T6=Metathion 50 E.C. 0.10%.

3. DESIGN:

(i) R.B.D. (ii) (a) 7, (b) N.A. (iii) 4. (iv) (a) and (b) 30 plants. (v) Nil. (vi) Yes.

4. GENERAL:

Same as in exp. no. 58(35) on page 647.

5. RESULTS:

(i) 52.73%, (ii) 34.83%. (iii) Treatment differences are not significant. (iv) Mean % of decrease in aphid infestation.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean %</td>
<td>69.50</td>
<td>89.74</td>
<td>47.32</td>
<td>40.99</td>
<td>31.35</td>
<td>51.81</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


1. BASAL CONDITIONS:

(i) (a) to (c) Nil. (ii) (a) Red sandy loam. (b) N.A. (iii) 15.4.1958. (iv) (a) Ploughing 3 times. (b) Broadcasting. (c) 4 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Harrison special. (vii) Unirrigated. (viii) Nil. (ix) 6.09". (x) 6.7.1958.

2. TREATMENTS:

6 insecticidal treatments: T0=Control, T1=Copper sandz 50.0.125%, T2=Dithane Z.78 0.15%, T3=Fermate 0.09%, T4=Curvat 0.4% and T5=Copperz 0.4%.
3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 4’ x 4.75’. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Since the germination was not uniform, gap-filling was done. (ii) As per treatments. (iii) 25 random leaves/replication were selected and number of spots were taken. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) and (vi) Nil. (vii) 14 months old seedlings were transplanted on bed at 2’ x 2’ spacing. Artificial inoculation with spores of “Colletotrichum Tabacum”.

5. RESULTS:
(i) 2151 spots. (ii) 944 spots. (iii) Treatment differences are highly significant. (iv) Av. number of spots on 25 random leaves.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number of spots</td>
<td>5259</td>
<td>1815</td>
<td>890</td>
<td>1145</td>
<td>1782</td>
<td>2014</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 393 spots.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop:— Tobacco.  
Site:— Tobacco Res. Sta., Hunsur.  
Type:— ‘D’.  
Ref:— C.T.R.I. 58(37).  
Object:— To study the effect of sulphur application to soil in controlling powdrey mildew on Tobacco.
Crop: Tobacco  
Site: Tobacco Res. Stn., Hunsur.  
Ref: C.T.R.I. 59(31).  
Type: 'D'.

Object: To study the effect of fungicidal spraying on leaf spots in nursery on cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) Nil. (ii) (a) Red sandy loam. (b) N.A. (iii) 30.5.1959. (iv) (a) Ploughing 3 to 4 times. (b) Broadcast. (c) 4 lb./ac. (d) N.A. (e) N.A. (v) Nil. (vi) Harrison Special. (vii) Unirrigated. (viii) Nil. (ix) 23.08. (x) 12.9.1959.

2. TREATMENTS:
9 fungicidal spraying treatments: T₀=Control, T₁=Copper sandoz 53 0.125%, T₂=Dithane Z.78 0.150%, T₃=Fermate 0.090%, T₄=Cupravit 0.400%, T₅=Copperan 0.400%, T₆=Shell copper 0.400% and T₇=Bordeaux mixture 4.450%.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 4'x4.75'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) 100 random leaves/replication are selected and number of spots are counted. (iii) N.A. (iv) (a) 1958-1960 but 2 more treatments were added in 1959). (b) No. (c) Nil. (v) and (vi) Nil. (vii) 11 months old seedlings were transplanted on bed at 2'x2' spacing. Artificial inoculation was done with spores of colleoco tihchum tabacum.

5. RESULTS:
   (i) 3203 spots. (ii) 1158 spots. (iii) Treatment effects are highly significant. (iv) Av. number of spots of 100 random leaves.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number of spots</td>
<td>6286</td>
<td>3687</td>
<td>1831</td>
<td>3452</td>
<td>3377</td>
<td>1748</td>
<td>3054</td>
<td>2192</td>
</tr>
</tbody>
</table>

S.E./mean = 473 spots.

---

Crop: Tobacco (Rabi).
Site: Tobacco Res. Stn., Hunsur.
Type: 'D'.

Object: To find out the best control measure for root knot nematodes in nursery on cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cigarette tobacco. (c) Nil. (ii) (a) Red sandy loam. (b) N.A. (iii) 17.10.1959. (iv) (a) 3 ploughings. (b) Broadcast. (c) 4 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Harrison Special. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 4.1.1960.

2. TREATMENTS:
2 chemical treatments: C₀=No fumigation (control) and C₁=Soil fumigation of nursery area with shell D.D.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 8'x4'. (v) No. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) As per treatments. (iii) % of infested seedlings. (iv) (a) 1958–contd. (Failed in 1958). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 6.7%. (ii) 1.0%. (iii) Treatment difference is significant. (iv) Av. % of incidence of root knot.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₀</th>
<th>C₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of incidence</td>
<td>11.0</td>
<td>3.5</td>
</tr>
</tbody>
</table>

S.E./mean = 0.17 %.
Crop :- Tobacco (Rabi).


Site :- Hookah and Chewing Tobacco Res. Sta., Pusa.

Type :- DP.

Object :- To study the effect of hormones and growth inhibitions in the suppression of suckers and on yield of hookah and chewing Tobacco.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Samphemp. (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 21.9.1957. (iv) (a) 4 ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3' x 2'. (e) 2. (f) G.M. with samphemp. (g) Bori Bharoo-10. (h) Irrigated. (i) 3 ploughings. (j) 2 weedings, 4 suckering and topping. (k) 49.28'. (l) 19.2.1958.

2. TREATMENTS:

5 chemical treatments : C0 = Control, C1 = N.A.A., C2 = I.B.A. and C3 = Mustard oil.

3. DESIGN:

(i) R.B.D. (ii) N.A. (iii) 6. (iv) (a) 15' x 30'. (b) 9' x 26'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Leaf curl and mosaic. (iii) Weight of suckers and yield of cured leaf. (iv) (a) 1956-1959. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Hailstorm on 9.1.1957. (vii) Nil.

5. RESULTS:

(i) 2145 lb./ac. (ii) 285.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1831</td>
<td>1644</td>
<td>1702</td>
<td>1671</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>56.0 lb./ac.</td>
<td></td>
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</tbody>
</table>

Crop :- Tobacco (Rabi).


Site :- Hookah and Chewing Tobacco Res. Sta., Pusa.

Type :- DP.

Object :- To study the effect of hormones in suppression of suckers and on the yield of hookah and chewing Tobacco.

1. BASAL CONDITIONS:

(i) (a) Maize+Raba-Tobacco. (b) Maize+Raba. (c) Nil. (ii) (a) Gangetic alluvium calcareous. (b) N.A. (iii) 24.10.1956. (iv) (a) 1 ploughing by planter. (b) Transplanting. (c) 2 lb./ac. (d) 3' x 2'. (e) 2. (f) G.M. with samphemp. (g) Bori Bharoo-23 (moist. rain). (h) 2 weedings, 4 suckering and topping. (i) 14.00'. (j) 30.1.1957.

2. TREATMENTS:

4 chemical treatments : C0 = Control, C1 = N.A.A., C2 = I.B.A. and C3 = Mustard oil.

3. DESIGN:

(i) R.B.D. (ii) N.A. (iii) 5. (iv) (a) 15' x 30'. (b) 9' x 26'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Leaf curl and mosaic. (iii) Weight of suckers and yield of cured leaf. (iv) (a) 1956-1959. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Hailstorm on 9.1.1957. (vii) Nil.

5. RESULTS:

(i) 1712 lb./ac. (ii) 117.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1831</td>
<td>1644</td>
<td>1702</td>
<td>1671</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>56.0 lb./ac.</td>
<td></td>
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</tbody>
</table>
Crop: Tobacco (Rabi).

Site: Hookah and Chewing Tobacco Res. Sta., Pusa.

Type: 'D'.

Object: To study the effect of hormones and growth inhibitions in suppression of suckers and on yield and quality of hookah and chewing Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sannhemp. (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 2.10.1958.
   (iv) (a) Ploughings. (b) Transplanting. (c) 4 lb./ac. (d) 3' x 2'. (e) 1. (v) G.M. with sannhemp + 50 lb./ac. of N (as A/S + + as mustard cake). (vi) D.P. - 401. (vii) Irrigated. (viii) 2 weedings, topping and suckering. (ix) 7.00'. (x) 10.3.1959.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 57(24) on page 651.

3. RESULTS:
   (i) 2428 lb./ac. (ii) 221.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C_6</th>
<th>C_7</th>
<th>C_8</th>
<th>C_9</th>
<th>C_4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2403</td>
<td>2406</td>
<td>2357</td>
<td>2489</td>
<td>2485</td>
</tr>
</tbody>
</table>

S.E./mean = 90.4 lb./ac.

Crop: Tobacco (Rabi).

Site: Hookah and Chewing Tobacco Res. Sta., Pusa.

Type: 'D'.

Object: To study the effect of shell-DD soil fumigant in the control of earthworms in Tobacco nurseries.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) 50 lb./ac. of N. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 18.8.1958. (iv) (a) Spadings. (b) Broadcast. (c) 4 lb./ac. (d) and (e) N.A. (v) Nil. (vi) D.P. - 401. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 9 to 17.10.1958.
2. **TREATMENTS:**

2 chemical treatments: $C_0 =$ Control and $C_1 =$ Application of shell-D-D soil fumigant at 400 lb./ac.

3. **DESIGN:**

(i) R.B.D. (ii) 2. (b) N.A. (iii) 12. (iv) (a) and (b) $6\times4'$. (v) Nil. (vi) Yes.

4. **GENERAL:**

(i) N.A. (ii) Earthworms. (iii) Weight of earthmounds, number of transplantable seedlings/plot. (iv) (a) 1936–1941. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**

(i) 710 seedlings/plot. (ii) 189.7 seedlings/plot. (iii) Treatment difference is not significant. (iv) Av. number of seedlings/plot.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$C_0$</th>
<th>$C_1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of seedlings/plot.</td>
<td>721</td>
<td>689</td>
</tr>
</tbody>
</table>

S.E./mean = 54.8 seedlings/plot.

---

**Crop:** Tobacco (Rabi)

**Site:** Hookah and Chewing Tobacco Res. Sta., Pusa.

**Type:** 'D'.

Object: To study the effect of shell-D-D soil fumigant in the control of earthworms in Tobacco nurseries.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (b) Maize + Rahan. (c) Nil. (ii) (a) Indo-gangetic alluvium calcareous. (b) N.A. (iii) 1.9.1959. (iv) (a) 4 ploughings. (b) Broadcast. (c) 4 lb./ac. (d) and (e) N.A. (v) (a) F.Y.M. on 1.7.1959. (vi) D.P.—401. (vii) Irrigated. (viii) 2 weedings. (ix) Nil. (x) 8 to 10.11.1959.

2. **TREATMENTS:**

9 chemical treatments: $C_0 =$ Control, $C_1 =$ Application of Shell-D-D fumigant at 450 lb./ac., $C_2 =$ Application of neem cake at 1000 lb./ac., $C_3 =$ Application of Chlor dane as dust at 98 lb./ac., $C_4 =$ Application of Chlor dane as spray at 2 lb./ac., $C_5 =$ Application of Aldrin as dust at 98 lb./ac., $C_6 =$ Application of Aldrin as spray at 2 lb./ac., $C_7 =$ Application of Dieldrin as dust at 98 lb./ac., and $C_8 =$ Application of Dieldrin as spray at 2 lb./ac.

3. **DESIGN:**

(i) R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) and (b) $6\times4'$. (v) Nil. (vi) Yes.

4. **GENERAL:**

(i) Good. (ii) Earthworms. (iii) Weight of earthmounds and no. of transplantable seedlings/plot. (iv) (a) 1936–1961 (with changed treatments). (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS:**

(i) 309 seedlings/plot. (ii) 86.8 seedlings/plot. (iii) Treatment differences are significant. (iv) Av. number of seedlings/plot.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$C_0$</th>
<th>$C_1$</th>
<th>$C_2$</th>
<th>$C_3$</th>
<th>$C_4$</th>
<th>$C_5$</th>
<th>$C_6$</th>
<th>$C_7$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number of seedlings</td>
<td>206</td>
<td>240</td>
<td>367</td>
<td>225</td>
<td>291</td>
<td>311</td>
<td>257</td>
<td>445</td>
</tr>
</tbody>
</table>

S.E./mean = 43.4 seedlings/plot.
Object — To find out the effect of seed rate on damping off disease in flue cured Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco nursery. (c) F.Y.M. at 10 tons/ac. (ii) (a) Black clayey soil. (b) N.A. (iii) 21.9.1954. (iv) (a) Ploughing 2 to 3 times and planking. (b) Broadcast. (c) to (e) N.A. (v) F.Y.M. at 10 tons/ac. mixed well in the upper layer of soil in the beds just before sowing. In addition, top dressing of 240 lb/ac. of A/S applied in 3 to 4 doses. (vi) Chatham (a flue-cured variety). (vii) Unirrigated. (viii) Pressing the seed beds after sowing and weeding at regular intervals. (ix) N.A. (x) 16, 19 and 19.11.1954.

2. TREATMENTS:
All combinations of (1) and (2)
(i) 4 seed rates: \( R_1 = 1.0, R_2 = 1.66, R_3 = 3.3 \text{ and } R_4 = 5.0 \text{ lb./ac.} \)
(ii) 2 perenox treatments: \( P_0 = \text{No prophylactic treatment} \text{ and } P_1 = \text{Prophylactic treatment with perenox at 4 oz. in 10 gallons.} \)

The prophylactic treatment was given once, 4 days before sowing. Uniform sprayings were given at one fourth gallon/bed after sowing as and when necessary.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 8. (iv) (a) and (b) 5'x3.5'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Seedlings grew satisfactorily during the nursery season. (ii) Nil. (iii) Area 'damped off', total number of seedlings obtained and number of transplantable seedlings. (iv) Nil. (v) Nil.

5. RESULTS:
(i) 420 plants/plot. (ii) 99.6 plants/plot. (iii) Main effect of R alone is highly significant. (iv) Av. number of transplantable seedlings/plot.

<table>
<thead>
<tr>
<th></th>
<th>( R_1 )</th>
<th>( R_2 )</th>
<th>( R_3 )</th>
<th>( R_4 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_0 )</td>
<td>365</td>
<td>356</td>
<td>408</td>
<td>321</td>
<td>393</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>324</td>
<td>412</td>
<td>505</td>
<td>495</td>
<td>424</td>
</tr>
<tr>
<td>Mean</td>
<td>345</td>
<td>384</td>
<td>502</td>
<td>489</td>
<td>430</td>
</tr>
</tbody>
</table>

S.E. of R marginal mean = 24.9 plants/plot.
S.E. of F marginal mean = 17.6 plants/plot.
S.E. of body of table = 35.2 plants/plot.
2. TREATMENTS:

Main-plot treatments:
2 dates of spraying: D1 = 7.1.1955 and D2 = 27.1.1955.

Sub-plot treatments:
6 fungicides: F0 = Unsprayed (control), F1 = Karathane W.P. 25 (0.1%), F2 = Thiovit (0.5%), F3 = Z. 78 (0.3%), F4 = Perenox Dithane (0.25%) and F5 = Water.

3. DESIGN:
(i) Split-plot. (ii) 2 main-plots/replications and 6 sub-plots/main-plot. (iii) N.A. (iv) (a) 19' x 16'. (b)ynesguard rows between plots. (v) N.A.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Observations on the six lowermost leaves on every plant in each plot were taken. Each leaf was imagined to have been divided into 8 sections and each infected section, irrespective of the extent of infection was counted as one. The infected sections were counted on upper and lower surfaces of each leaf. (iv) (a) 1954-1955. (b) and (c) Nil. (v) and (vi) Nil. (vii) The experiment has been analysed as R.B.D. separately for two dates of spraying. Results given separately for two dates of spraying.

5. RESULTS:

For D1
(i) 51.9 infected sections/plot. (ii) 12.2 infected sections/plot. (iii) Treatment differences are significant. (iv) Average number of infected sections/plot.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F0</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av yield</td>
<td>89.7</td>
<td>17.8</td>
<td>3.3</td>
<td>61.8</td>
<td>47.8</td>
<td>91.3</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>6.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For D2
(i) 83.9 infected sections/plot. (ii) 22.8 infected sections/plot. (iii) Treatment differences are not significant. (iv) Average number of infected sections/plot.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F0</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av yield</td>
<td>121.0</td>
<td>49.8</td>
<td>43.0</td>
<td>76.5</td>
<td>80.3</td>
<td>132.8</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>11.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'D'.

Object:— To study the effect of various fungicides on 'gumming off' of tobacco leaves.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco nursery. (c) F.Y.M. at 10 tons/acre. (iii) (a) Bajri clayey soil. (b) N.A. (iii) 22.2/1.54. (iv) (a) Ploughing 2 to 3 times and planking. Raised seed beds, upper layer mixed with sand at the rate of 50 tons/acre and F.Y.M. (b) Broadcast. (c) 3.33 lb./ac. (d) and (e) N.A. (v) F.Y.M. at 10 tons/acre mixed well in the upper layer of soil in the beds just before sowing. Top dressing of 240 lb. of A/S applied in 3 to 4 doses. (vi) Chathum. (vii) Unirrigated. (viii) Mowing the seed beds after sowing and weeding at regular intervals. (ix) N.A. (x) 8, 22 and 30.11.1954.

2. TREATMENTS:
8 fungicides: F0 = Control (Unsprayed), F1 = Perenox (0.25%), F2 = Biltrox (0.23%), F3 = Fermate (0.09%), F4 = Chelant compound (0.315%), F5 = Dithane Z 78 (0.15%), F6 = Wetcol (0.375%) and F7 = Bordeaux mixture (0.4%).
Wetcol is desiccated bordeaux mixture, hence the two treatments were added this year. Propylactic spraying with each fungicide was given five days before sowing. After sowing, fungicides were sprayed uniformly as and when necessary.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 8. (iv) (a) and (b) 5' X 3.5'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Seedlings grew satisfactorily during the nursery season. (ii) Nil. (iii) Area 'damaged off', total number of seedlings obtained and no. of transplantable seedlings. (iv) to (vii) Nil.

5. RESULTS:
(i) 541 plants/plot. (ii) 118.9 plants/plot. (iii) Treatment differences are highly significant. (iv) Av. number of transplantable seedlings/plot.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F_0</th>
<th>F_1</th>
<th>F_2</th>
<th>F_3</th>
<th>F_4</th>
<th>F_5</th>
<th>F_6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number</td>
<td>90</td>
<td>609</td>
<td>553</td>
<td>589</td>
<td>502</td>
<td>533</td>
<td>511</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>52.6 plants/plot.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'D'.

Object:—To find out the most advantageous dose of Perenox against damping-off in flue cured Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco nursery. (c) F.Y.M. at 15 tons/ac. (ii) (a) Black clayey soil. (b) N.A. (iii) 13.5.19.4. (iv) (a) Ploughing 2 to 3 times and planking. Raised seed beds, upper layer mixed with sand at the rate of 50 tons/ac. and F.Y.M. (b) Seed broadcast (c) 3.3 lb/ac. (d) and (e) N.A. (v) F.Y.M. at the rate of 10 tons/ac. mixed well in the upper layer of soil in the beds just before sowing. In addition top dressing of 240 lb/ac. of A/S applied in 3 to 4 doses. (vi) C. tuberculosis. (vii) Unirrigated. (viii) Pressing the seed beds after sowing and weeding at regular intervals. (ix) N.A. (x) 2, 8, 15, 19 and 29.11.1954.

2. TREATMENTS:
6 doses of perenox: D_0 = Control (no spraying), D_1 = 21, D_2 = 5, D_3 = 7, D_4 = 10 and D_5 = 12 g/gallon/cent of area.

One prophylactic spraying of Perenox (4 oz. in 10 gallons) was given. In all eleven sprayings of Perenox (2 oz. in 10 gallons) were given according to weather conditions.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 12. (iv) (a) and (b) 5' X 3'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Seedlings grew satisfactorily during the nursery season. (ii) Nil. (iii) Area "damaged off", total number of seedlings and no. of transplantable seedlings. (iv) to (vii) Nil.

5. RESULTS:
(i) 453 plants/plot. (ii) 189.8 plants/plot. (iii) Treatment differences are highly significant. (iv) Av. number of transplantable seedlings/plot.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D_0</th>
<th>D_1</th>
<th>D_2</th>
<th>D_3</th>
<th>D_4</th>
<th>D_5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>40</td>
<td>513</td>
<td>530</td>
<td>479</td>
<td>509</td>
<td>644</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>54.8 plants/plot.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Tobacco.  
Ref: C.T.R.I. 54(44).  
Site: Central Tobacco Res. Instt., Rajahmundry.  
Type: 'D'.

Object: To study the effect of hormones on rooting and establishment of tobacco seedlings and eventually on the yield and quality of tobacco.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Tobacco. (c) 60 lb. ac. of A/S. (ii) (a) Deep black soil. (b) N.A. (iii) 20.10.1954. (iv) (a) Ploughing and leveling. (b) Transplanting (c) N.A. (d) 35° x 35°. (e) N.A. (v) 100 lb. ac. of A/S. (vi) Harrison (special). (vii) Unirrigated. (viii) 3 weedicings, interculture one month after transplanting. (ix) 0.53°. (x) 1st week of December, January, February and March.

2. TREATMENTS:
   6 fungicidal treatments: T_1 = Control, T_2 = Control (Charcoal powder), T_3 = Indole acetic acid 0.05%, T_4 = Indole acetic acid 0.1%, T_5 = Indole acetic acid 0.2%, T_6 = Indole butyric acid 0.05%, T_7 = Indole butyric acid 0.1% and T_8 = Indole butyric acid 0.2%.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 22'x22'. (b) 19'x19'. (v) 2 rows left as border. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Height, number of leaves, number of gaps, yield of cured leaf and grades of leaves. (iv) to (vii) Nil.

5. RESULTS:
   (i) 85.6 gms./plant. (ii) 12.94 tns./plant. (iii) Treatment differences are highly significant. (iv) Av. weight of cured leaf in gms./plant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>77.4</td>
<td>83.0</td>
<td>90.0</td>
<td>86.0</td>
<td>85.7</td>
<td>91.4</td>
<td>85.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>6.47 gms./plant.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Tobacco.  
Ref: C.T.R.I. 54(45).  
Site: Cigar and Cherricot Tobacco Res. Sta., Vedassandur.  
Type: 'D'.

Object: To investigate the effect of vegetable oils and their emulsions in controlling the growth of suckers in cigar Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—Cambu. (b) Cambu. (c) N.A. (ii) (a) Red loam. (b) N.A. (iii) 23.10.1954. (iv) (a) 4 plowings. (b) Transplanting. (c) N.A. (d) 2.5'x2'. (e) 1. (iv) 20 C.I. Iac. of F.Y.M.+50 lb./ac. of N as A/S. (v) Fallowing. (vi) Irrigated. (vii) 1 hand weeding, 1 hoeing, 1 mummets digging and 1 topping. (ix) 6.30°. (x) 22.1.1955.

2. TREATMENTS:
   13 sucker controlling treatments: T_1 = Control (unsuckered), T_2 = Control (suckered), T_3 = Coconut oil, T_4 = Groundnut oil, T_5 = Glycerine, T_6 = Neem oil, T_7 = Sesamum oil, T_8 = Gum solution, T_9 = Coconut oil emulsion, T_10 = Groundnut oil emulsion, T_11 = Glycerine solution, T_12 = Neem oil emulsion and T_13 = Sesamum oil emulsion.

The glycerine solution, 1% emulsified and oil emulsions at 25% by volume concentration applied to the top most 4 leaf axils immediately after topping.

3. DESIGN:
   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) 5'x10'. (b) 5'x6'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Weight of suckers at intervals of 10 days from the treated 4 leaf axils as well as from the whole plants. (iv) (a) 1554—1955. (b) N/A. (c) Nil. (v) to (vi) Nil.
5. RESULTS:

Total suckers from all leaf axils of 6 treated plants
(i) 1182 gms.  (ii) 241.4 gms.  (iii) Treatment differences are significant. (iv) Av. weight of suckers from 6 treated plants in gms.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. weight</td>
<td>976</td>
<td>1192</td>
<td>1123</td>
<td>888</td>
<td>1635</td>
<td>1311</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>98.5 gms.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Suckers from top 4 treated leaf axils of 6 treated plants
(i) 309 gms.  (ii) 160.5 gms.  (iii) Treatment differences are significant. (iv) Av. weight of suckers from top 4 treated leaf axils in gms.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. weight</td>
<td>388</td>
<td>17</td>
<td>152</td>
<td>396</td>
<td>370</td>
<td>437</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>65.5 gms.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop  : Tobacco.  

Site  : Hanekare, Kothanahalli and Thorasetthalli (Maddur)  
Type  : 'D'. and Hunsur.

Object  : To find out the suitable control measures against leaf spot Anthracnose in fields on Tobacco.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Red soil in Hanekare, Kothanahalli and Hunsur. Black in thorasetthalli. (b) N.A. (vii) 21.6.1958. (b) Ploughing. (b) Broadcasting. (c) 3 lb/a. (d) 33'x33'. (e) N.A. (vii) Nil. 
(vii) Harrison special. (vii) Unirrigated. (viii) Nil. (ix) 3.55' in 7 days at Maddur and 6.35' in 9 days at Hunsur. (a) 25.8.1958.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of priming : P0 = No priming and P1 = Priming of leaves.
(2) 2 levels of spraying-diflufen 78 : S0 = No spraying and S1 = Spraying.

3. DESIGN:
(i) Fact in R.B.D.  (ii) (a) 4. (b) N.A. (iii) 3 in Hanekare, 2 in Kothanahalli, 2 in Thorasetthalli and 1 in Hunsur. (iv) (a) and (b) 500 plants/plot. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) As per observations. (iii) No. of Anthracnose spots up to 7 basal leaves from 10 random plants/plot. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. conducted by Tobacco Res. Stn., Hunsur.

5. RESULTS:

<table>
<thead>
<tr>
<th>Spots/plot</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
</tr>
<tr>
<td>S0</td>
</tr>
<tr>
<td>P1</td>
</tr>
<tr>
<td>S1</td>
</tr>
<tr>
<td>Mean</td>
</tr>
</tbody>
</table>
Crop > Tobacco.  
Ref > C.T.R.I. 59(35).  
Site > Kothanahalli, Thorasetthalli (Madder) and Hunsur.  Type > 'D'.  

Object > To find out the suitable control measures against leaf spot Anthracnose in fields on Tobacco.

1. BASAL CONDITIONS:
(i) (a) to (e) N.A.  (ii) (a) Kothanahalli and Hunsur—Red soil.  Thorasetthalli—Black soil.  (b) N.A.  (iii) 17.6.1959.  (iv) (a) Ploughing.  (b) Broadcasting.  (c) 3 lb./ac.  (d) 33' x 33'.  (e) N.A.  (v) Nil.  (vi) Harrison (special).  (vii) Unirrigated.  (viii) Nil.  (ix) N.A.  (x) 19.8.1959.

2. TREATMENTS:
Same as in expn. no. 58(40) on page 658.

3. DESIGN:
(i) Fact. in R.B.D.  (ii) (a) 4;  (b) N.A.  (iii) 2 in Kothanahalli 2 in Thorasetthalli and 4 in Hunsur.  (iv) (a) and (b) 500 plants/plot.  (x) Nil.  (v) Yes.

4. GENERAL:
(ii) Fair.  (ii) As per observations crs.  (iii) No. of Anthracnose spots (plo) 7 basal leaves from 10 random plants/plot.  (iv) 1958—1960.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:

1 Anthracnose spots/plant
(i) 115.7 spots/plant.  (ii) 37.35 spots/plant.  (iii) Treatment differences are significant.  (iv) Av. no. of Anthracnose spots/plant.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>159.8</td>
<td>123.1</td>
<td>141.4</td>
</tr>
<tr>
<td>P1</td>
<td>102.8</td>
<td>77.2</td>
<td>90.0</td>
</tr>
</tbody>
</table>

Mean 131.3 100.2 115.7
S.E. of any marginal mean = 9.34 spots/plant.
S.E. of body of table = 13.21 spots/plant.

11 Frog eye/plant
(i) 4.7 spots/plant.  (ii) 7.8 frog eye spots/plant.  (iii) Treatment differences are not significant.  (iv) Av. no. of Frog eye spots/plant.
Crop - Tobacco.  
Site - Cigar and Cheroott Tobacco Res. Stn., Vedasandur  
Type - 'DC'.


Object: - To study the effect of topping and certain vegetable oils and their emulsions in controlling the growth of suckers in cigar Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Red loam. (b) N.A. (iii) 2.11.1955: Gaps filled on 7.11.1955. (iv) (a) 4 ploughings. (b) Transplanting. (c) 8,712 plants/acre. (d) 30' x 24'. (e) 1. (v) 89 tons/ac. of F.Y.M.+50 lb/ac. of N as A/S. (vi) Vellavaakhat. (vii) Irrigated. (viii) I hand weeding and mammati digging, topping as per treatments.  (ix) N.A.  (x) 10.2.1956.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of topping: T₁=Topping at 10 leaves and T₂=Topping at 14 leaves.

   Sub-plot treatments:
   13 sucker controlling treatments: S₁=Control (unsuckered), S₂=Control (suckered), S₃=Coconut oil, S₄=Groundnut oil, S₅=Glycerine, S₆=Neem oil, S₇=Sesamum oil, S₈=Gum solution, S₉=Coconut emulsion, S₁₀=Groundnut oil emulsion, S₁₁=Neem oil emulsion and S₁₂=Sesamum oil emulsion.

   The glycerine solution, gum solution and oil emulsions at 25% by volume concentration applied to the top most 4 leaf axils immediately after topping.

3. DESIGN:
   (i) Split plot. (ii) 2 main-plots/replications ; 12 sub-plots/main-plot. (b) N.A.  (iii) 6. (iv) (a) 10' x 5'. (b) 6' x 5'. (v) 2' on either side.  (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of cured leaves. (iv) (a) 1955 - N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A.  (vi) Commencement of monsoon was late.  (vii) Nil.

5. RESULTS:
   (i) 1684 lb/ac.  (ii) (a) 267.7 lb/ac. (b) 189.9 lb/ac.  (iii) Main effect of T alone is highly significant. (iv) Av. yield of cured leaf in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>S₆</th>
<th>S₇</th>
<th>S₈</th>
<th>S₉</th>
<th>S₁₀</th>
<th>S₁₁</th>
<th>S₁₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₁</td>
<td>1377</td>
<td>1670</td>
<td>1325</td>
<td>1706</td>
<td>1488</td>
<td>1597</td>
<td>1500</td>
<td>1483</td>
<td>1440</td>
<td>1534</td>
<td>1500</td>
<td>1556</td>
<td>1515</td>
</tr>
<tr>
<td>T₂</td>
<td>1614</td>
<td>1846</td>
<td>2122</td>
<td>1823</td>
<td>1982</td>
<td>1938</td>
<td>1837</td>
<td>1767</td>
<td>1798</td>
<td>1815</td>
<td>1764</td>
<td>1946</td>
<td>1854</td>
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<tr>
<td>Mean</td>
<td>1495</td>
<td>1738</td>
<td>1724</td>
<td>1763</td>
<td>1735</td>
<td>1768</td>
<td>1668</td>
<td>1625</td>
<td>1619</td>
<td>1674</td>
<td>1632</td>
<td>1751</td>
<td>1684</td>
</tr>
</tbody>
</table>
S.E. of difference of two:

1. T marginal means = 44.6 lb./ac.
2. S marginal means = 77.5 lb./ac.
3. S means at the same level of T = 109.6 lb./ac.
4. T means at the same level of S = 114.3 lb./ac.

Crop: Tobacco (Rabi).
Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'R'.

Object: To study the effect of different crops in rotation with tobacco on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) As per treatments. (b) Tobacco. (c) 20 lb./ac. of N as A/S. (ii) (a) Deep black soil. (b) N.A. (iii) 31.10.1957. (iv) (a) to (e) N.A. (v) M.C. at 3 tons/ac. and A/S at 20 lb./ac. of N. (vi) Harrison special (medium). (vii) Unirrigated. (viii) Gap filling and interculture with planet junior hoe. (ix) 0.2". (x) 5 prnings from 9.1.1958 to 6.2.1958.

2. TREATMENTS:
   5 rotational treatments: A=Cluster beans-Sorghum-Fallow-Tobacco, B=Chillies with 20 lb./ac. of N-Fallow-Fallow-Tobacco, C=Chillies with 40 lb./ac. of N-Fallow-Dry paddy-Tobacco, D=Fallow-Cotton with 20 lb./ac. of N-Fallow-Tobacco and E=Fallow-Tobacco-Fallow-Tobacco.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 5. (iv) (a) 23'4"x38'6". (b) 19'3"x31'. (v) One guard row on all side. (vi) Yes

4. GENERAL:
   (i) Good. (ii) Catterpillar attack. DDT spraying at 2 oz in 10 gallons of water. Aphids attack Banadig and Endrin sprayed. (iii) Yield of green leaf. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) and (vi) Nil. (vii) The experiment could not be analysed because of lack of information on all treatment effects in the 1st cycle of the rotation experiment.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A2</th>
<th>B2</th>
<th>C2</th>
<th>D2</th>
<th>E1 + E4</th>
<th>G.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>5780</td>
<td>5684</td>
<td>2635</td>
<td>5029</td>
<td>5970</td>
<td>5178</td>
</tr>
</tbody>
</table>

---

Crop: Tobacco.
Site: Central Tobacco Res. Instt., Rajahmundry. Type: 'R'.

Object: To study the effect of different crops in rotation with tobacco on the yield and quality of cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Deep black soil. (b) N.A. (iii) 17.11.1958. (iv) (a) to (e) N.A. (v) M.C. at 3 tons/ac. and A/S at 20 lb./ac. of N. (vi) Tobacco: Harrison special (medium). (vii) Unirrigated. (viii) N.A. (ix) 7.2". (x) From 20.1.1959 to 4.3.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in expct. no. 57(25) above.
4. GENERAL:
   (i) Normal. (ii) Caterpillar attack on tobacco. Spraying was done with DDT at 2 ozs. in 10 gallons of water. Orobanchec was removed once. (iii) Yield of green leaf. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Heavy rains. (vii) Nil.

RESULTS:
   (i) 5915 lb./ac. (ii) 408.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A₁</th>
<th>B₁</th>
<th>C₁</th>
<th>D₁</th>
<th>E₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>4634</td>
<td>8455</td>
<td>3721</td>
<td>5404</td>
<td>7359</td>
</tr>
</tbody>
</table>

S.E./mean = 182.8 lb./ac.

Site: Central Tobacco Res. Inst., Rajahmundry. Type: 'R'.
Object: To study the effect of different crops in rotation on the yield and quality of Cigarette Tobacco.

4. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) F.Y.M. at 3 tons/ac. and A/S at 100 lb./ac. to tobacco and F.Y.M. at 3 tons/ac. to coriander. (ii) (a) Deep black soil. (b) N.A. (iii) 17.11.1955. (iv) (a) 2 ploughings with country plough. (b) Transplanted. (c) N.A. (d) 33" x 31". (e) 1. (v) 3 tons/ac. of M.C. broadcast in May. A/S at 100 lb./ac. applied by working a deep placing implement. (vi) Harrison special (medium). (vii) Unirrigated. (viii) Interculturing was done with plough once in two weeks. (ix) 7.2°. (x) From 16.1.1959 to 4.3.1959.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) 10. (b) N.A. (iii) 5. (iv) (a) 23'41" x 18'6". (b) 16'6" x 33'0". (v) One guard row on all sides. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Aphids attack on tobacco. Basudin was sprayed at 1 oz in 5 gallons of water. (iii) Yield of green leaf. (iv) to (vi) Nil. (vii) Gingelly crop failed.

RESULTS:
   (i) 7770 lb./ac. (ii) 632.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of green leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A₁</th>
<th>B₁</th>
<th>C₁</th>
<th>D₁ + D₂ + E₁ + E₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>7807</td>
<td>8385</td>
<td>6230</td>
<td>7937</td>
</tr>
</tbody>
</table>

S.E./mean = 282.7 lb./ac.

Site: Cigar and Cheroot Tobacco Res. Sta., Vedasandur. Type: 'M'.
Object: To study the effect of different fertilizers on chalum crop in rotation with Tobacco.
1. BASAL CONDITIONS:
   (i) (a) Tobacco—Cholam. (b) Tobacco. (c) 50 lb./ac. of N as A/S+8.93 ton/ac. of F.Y.M. (ii) (a) Red loam. (b) N.A. (iii) 22.2.1954. (iv) (a) 4 ploughings. (b) Line-sowing. (c) N.A. (d) 12''x9''. (e) 1. (v) Nil. (vi) CO—9. (vii) Irrigated. (viii) 1 thinning and 1 weeding. (ix) 1.71%. (x) 27.5.1954.

2. TREATMENTS:
   5 manurial treatments: $M_0$ = Control (no manure), $M_1$ = 30 lb./ac. of N as A/S, $M_2$ = 10 lb./ac. of N as A/S+30 lb./ac. of P.O. as Super, $M_3$ = 2.68 ton/ac. of F.Y.M. and $M_4$ = 15 lb./ac. of N as A/S+1.34 tons/ac. of F.Y.M.
   Treatment applied broadcast at sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 19'x10'. (b) 16'x9'. (v) 1.5''x0.5''. (vi) Yes. (vii) Nil. (viii) to (x) N.A.

4. RESULTS:
   (i) 2497 lb./ac. (ii) 509.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
   Treatment $M_0$ $M_1$ $M_2$ $M_3$ $M_4$
   Av. yield 977 1219 895 944 1110
   S.E./mean = 187.5 lb./ac.

---

Site:— Cigar and cheroot Tobacco Res. Sta., Vedasandur. Type:— 'M'.
Object:— To study the effect of different fertilizers on cholam crop in rotation with Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—Cholam. (b) Tobacco. (c) 20 CL./ac. of F.Y.M.+50 lb./ac. of N as A/S. (ii) (a) Reddish brown sandy loam. (b) N.A. (iii) 22.2.1955. (iv) (a) 4 ploughings. (b) Line sowing. (c) N.A. (d) 12''x9''. (e) 1. (v) Nil. (vi) CO—9. (vii) Irrigated. (viii) Thinning and weeding. (ix) 5.87''. (x) 3.6.1955.

2. TREATMENTS to 4. GENERAL:
   Same as in exp. no. 54(24) on page 662.

5. RESULTS:
   (i) 2497 lb./ac. (ii) 509.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
   Treatment $M_0$ $M_1$ $M_2$ $M_3$ $M_4$
   Av. yield 2278 2159 2459 2429 2762
   S.E./mean = 254.5 lb./ac.

---

Site:— Cigar and cheroot Tobacco Res. Sta., Vedasandur. Type:— 'M'.
Object:— To study the effect of different manures on Cumbu crop and its residual effects on succeeding Cumbu and Tobacco crops.
1. **BASAL CONDITIONS**:

(i) (a) Tobacco—Cumbu—Cumbu—Tobacco. (b) Tobacco. (c) 6.70 tons/ac. of F.Y.M.+100 lb./ac. of N as A/S. (ii) (a) Red loam. (b) N.A. (iii) 26.2.1954. (iv) (a) 4 ploughings. (b) Line sowing. (c) N.A. (d) 12"×9". (e) N.A. (f) Nil. (g) CO.—3. (h) Irrigated. (i) Thinning and weeding. (j) 8.71". (k) 2.6.1954.

2. **TREATMENTS**:

5 manural treatments: $M_0$ =Control (no manure), $M_1$ =30 lb./ac. of N as A/S, $M_2$ =30 lb./ac. of N as A/S+30 lb./ac. of P₂O₅ as Super, $M_3$ =2.66 tons/ac. of F.Y.M., $M_4$ =15 lb./ac. of N as A/S+1.33 tons/ac. of F.Y.M.

3. **DESIGN**:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 26.5'×16'. (b) 18'×12'. (v) One row around. (vi) Yes.

4. **GENERAL**:

(i) Normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Second crop of *cumbu* (July—October) failed completely.

5. **RESULTS**:

(i) 1430 lb./ac. (ii) 210.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_0$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1442</td>
<td>1238</td>
<td>1434</td>
<td>1549</td>
<td>1489</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>105.0 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Crop:** *Cumbu* (*Pennisetum tyoides*). **Ref:** C.T.R.I. 55(33).

**Site:** Cigar and CHEROOT Tobacco Res. Stn., Vedassandur. **Type:** M'.

Object—To study the effect of different manures on *Cumbu* crop and its residual effects on succeeding *Cumbu* and *Tobacco* crop.

1. **BASAL CONDITIONS**:

(i) (a) Tobacco—Cumbu—Cumbu—Tobacco. (b) Tobacco. (c) 6.7 tons/ac. of F.Y.M.+100 lb./ac. of N as A/S. (ii) (a) Reddish brown sandy loam. (b) N.A. (iii) 26.2.1955 (iv) (a) 4 ploughings. (b) Line sowing. (c) N.A. (d) 12"×9". (e) N.A. (f) Nil. (g) CO.—3. (h) Irrigated. (i) Weeding and thinning. (j) 5.58". (k) 26.5.1955.

2. **TREATMENTS** and 3. **DESIGN**:

Same as in expt. no. 54(29) on page 663.

4. **GENERAL**:

(i) Normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. **RESULTS**:

(i) 1109 lb./ac. (ii) 272.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_0$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1020</td>
<td>829</td>
<td>1245</td>
<td>1263</td>
<td>1087</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>136.0 lb./ac.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Crop: Cumbu (Pennisetum typhoides).

Site: Cigar and Cheroot Tobacco Res. Sta., Vedasandur. Type «M».

Object: To study the residual effect of manures applied to previous Cumbu crop on succeeding crop.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—Cumbu—Cumbu—Tobacco. (b) Cumbu. (c) As per treatments. (ii) (a) Reddish brown sandy loam. (b) N.A. (iii) 20.7.1955. (iv) (a) 4 ploughings. (b) Line sowing. (c) N.A. (d) 12 x 9'.

2. TREATMENTS and DESIGN:
   Same as in expt. no. 54(29) on page 663.
   The manures were applied to the previous cumbu crop.

4. GENERAL:
   (i) Sub-normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1953—1955. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 439 lb./ac. (ii) 186 0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>393</td>
<td>361</td>
<td>458</td>
<td>512</td>
<td>470</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>91.0 lb./ac.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Crop: Cumbu (Pennisetum typhoides).

Site: Cigar and Cheroot Tobacco Res. Sta., Vedasandur. Type «M».

Object: To study the effect of different fertilizers on the Cumbu crop coming in rotation with Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—Cumbu. (b) Tobacco. (c) F.Y.M. at 20 C.L./ac. + 50 lb./ac. of N as A/S. (ii) (a) Red loam. (b) N.A. (iii) 25.6.1954. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) 12 x 9'. (c) N.A. (v) Nil. (vi) CO.—3. (vii) Irrigated. (viii) I thinning and I weeding. (ix) 3.48'. (x) 24.9.1954.

2. TREATMENTS: 15 manurial treatments: M₀=Control (no manure), M₁=10 lb./ac. of N as A/S, M₂=30 lb./ac. of P2O₅ as Super, M₃=20 lb./ac. of P2O₅ as rock phosphate, M₄=20 lb./ac. of N as F.Y.M., M₅=M₁+M₂, M₆=M₁+M₃, M₇=M₄+M₃, M₈=M₄+M₅, M₉=30 lb./ac. of P₂O₅ as F.Y.M. reinforced with Super, M₁₀=20 lb./ac. of P₂O₅ as F.Y.M. reinforced with rock phosphate, M₁₁=15 lb./ac. of N as A/S+15 lb./ac. of N as F.Y.M., M₁₂=M₁+30 lb./ac. of P₂O₅ as Super, M₁₃=M₁+30 lb./ac. of P₂O₅ as F.Y.M. reinforced with rock phosphate and M₁₄=M₁+20 lb./ac. of P₂O₅ as rock phosphate reinforced with 10 lb./ac. of P₂O₅ as Super.
   F.Y.M. and reinforced F.Y.M. broadcast a fortnight before sowing. Other fertilizers broadcast at sowing.

3. DESIGN:
   (i) R.B.D. (ii) 15. (b) N.A. (iii) 6. (iv) (a) 19' x 10'. (b) 16' x 9'. (v) 1.5' x 0.5'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1953—1954. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:

(i) 550 lb./ac.  (ii) 124.0 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
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<tr>
<td>Av. yield</td>
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<td>675</td>
<td>629</td>
<td>484</td>
<td>496</td>
<td>526</td>
<td>526</td>
<td>532</td>
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<table>
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<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
<th>M₁₁</th>
<th>M₁₂</th>
<th>M₁₃</th>
<th>M₁₄</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>581</td>
<td>526</td>
<td>560</td>
<td>584</td>
<td>475</td>
<td>608</td>
<td>532</td>
</tr>
</tbody>
</table>

S.E./mean = 50.6 lb./ac.