INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS

NATIONAL INDEX

OF

AGRICULTURAL

FIELD

EXPERIMENTS

VOL. 15 PART 1

CENTRAL INSTITUTES

1948–53

PUBLISHED BY

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

NEW DELHI
FOREWORD

It is a well recognized fact that the level of agricultural production in India is one of the lowest in the world and it is only by the exploitation of scientific methods of agriculture that we can hope to increase our agricultural production to the level necessary for providing a reasonable standard of living to the country's population. Properly planned and conducted field experiments provide a reliable basis for propagating improved agricultural techniques among farmers. A number of research institutes and other experimental centres are functioning under the Central Ministry of Agriculture, the Commodity Committees and the State Governments, in which research on agricultural problems is going on. The need for an integrated account of the researches done in these organisations and institutions in the country has been felt for a long time, particularly in the context of planning. The absence of such a unified account has often led to duplication of work and delay in the utilisation of the results for practical farming. The Institute of Agricultural Research Statistics of the Indian Council of Agricultural Research has, therefore, rendered a most timely service by preparing a compendium of all agricultural field experiments conducted in India up to 1953 and similar compendia are under preparation by the Institute for subsequent years.

The present compendium contains critical summaries of results of experiments bearing on important agronomic factors such as the responses 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. I am sure that these results will be fully utilised by agricultural institutions, research workers, planners and extension organisations. The chief merit of the present publication is that it brings together in one place the results of experimentation carried out under diverse soil, climatic and agricultural conditions obtaining in India. Workers in one State can thus supplement data for their own area by results from other regions where conditions may be similar and thereby reinforce their own conclusions. For the same reason I hope that this publication will be of use to workers in other countries also.

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 whole hearted 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 publication 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.

A.D. PANDIT

Vice-President,
Indian Council of Agricultural Research.

NEW DELHI,
August 20, 1962.
A large number of agricultural field experiments on different problems is being conducted in the country by Central and State Governments, Research Institutes, Commodity Committees and other organisations engaged in agricultural research. In addition, a number of schemes involving field experimentation is sponsored by the Indian Council of Agricultural Research in different States. The absence of a unified record of the results of these various experiments has considerably handicapped planning of further research and development and has often led to duplication of efforts.

Vaidyanathan brought out in 1933 a useful catalogue of manurial experiments conducted in India till then. Considering that Vaidyanathan’s work was confined to manurial experiments and the fact that an enormous increase has taken place in the number and scope of agronomic experiments in recent years in India, the Indian Council of Agricultural Research launched the scheme of National Index of Field Experiments in 1954. The object of the scheme was two-fold:

(i) the preparation of compendium of all the field experiments for the period 1935-53 and

(ii) the preparation of index cards for individual experiments from 1954 onwards.

Under the scheme, results of all agricultural field experiments other than purely varietal trials were to be consolidated. Subsequently at the time of the extension of the scheme in 1959 it was decided that the compendium would be prepared in the first instance for the period 1948-53 and a similar compendium would be prepared for the period 1954-59. The present series for the period 1948-53 has been prepared in pursuance of this decision.

The compendium 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 & 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 physical features, soils, rainfall and climate, agricultural production and area under different crops is given. A map showing different regions of the State, soils and agricultural research farms is also included. The experiments reported in each volume have been arranged cropwise 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 given together (e.g., MV as Manurial-cum-Varietal). The results of an experiment are given along with other basic information such as rotation of crops followed, cultural practices adopted, etc.

For making maximum use of the experimental data all the important tables giving the average yields of various treatments along with the appropriate standard errors have been presented. No attempt has, however, been made to summarise the data of groups of experiments on any particular item and to draw any general conclusions. This will be done for the period 1948-59 while publishing the compendium for the period 1954-59.

This publication is the result of the co-operative endeavour of a large number of persons both at the Centre and in the States. I should particularly mention in this connection, guidance and help rendered in the formulation of the scheme by Dr. D.J. Finney F.R.S. of Aberdeen University, Scotland, during his stay at the Institute of Agricultural Research Statistics as an F.A.O. Statistical Expert in 1962-63.
At the Institute of Agricultural Research Statistics, the work under the scheme was carried out under the supervision and guidance of Shri T.P. Abraham, Assistant Statistical Adviser. Shri G.A. Kulkarni, Statistician, looked after the detailed working of the scheme. These officers have been largely responsible for the preparation of the manuscript of the compendium and it is a pleasure to thank them for the hard work they have put in for getting this compendium ready. Messrs O.P. Kathuria, B.V. Srikantiah, M.L. Sahni, B.P. Dyundi, S.D. Bal and P.K. Jain of the statistical staff of the Institute deserve special mention for their careful scrutiny of the data and preparation of the material for the compendium. Thanks are also due to Dr. Uttam Chand, Professor of Statistics, now with the Central Statistical Organisation, Shri K.S. Avadhany, Assistant Statistician, also now with the Central Statistical Organisation, and Shri K.C. Raut, Statistician in this office who were associated with the scheme in its initial stages.

The burden of collecting data from original records by visiting different research stations and the analysis of a large number of experiments, only the primary data for which had been recorded in the files, fell on the regional staff appointed by the Indian Council of Agricultural Research in different States. They deserve to be congratulated for the patient work they have put in. The State Departments of Agriculture, Central Institutes and Commodity Committees made data for the experiments conducted within their jurisdiction readily available. The Indian Council of Agricultural Research acknowledges this willing co-operation without which the consolidation of the results would not have been possible. Various State officers who helped the project by making the data accessible to the statistical staff of the project and worked as the regional supervisors for the scheme also deserve thanks by the Council for their active help. The list of names of the regional supervisors is given on the following page.

NEW DELHI,
August 16, 1962.

V.G. Panse
Statistical Adviser,
Institute of Agricultural Research Statistics.
(I.C.A.R.)
REGIONAL SUPERVISORS FOR THE SCHEME OF THE NATIONAL INDEX OF FIELD EXPERIMENTS

<table>
<thead>
<tr>
<th>Region and headquarters</th>
<th>Regional Supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Andhra Pradesh</strong> <em>(Hyderabad)</em></td>
<td>Shri D.V.G. Krishnamoorthy, Deputy Director of Food Production, Andhra Pradesh. Shri Jagannath Rao, Joint Director of Agriculture (Research), Andhra Pradesh. Dr. Khadruddin Khan, Joint Director of Agriculture (Research), Andhra Pradesh. Dr. Wahruddin, Headquarters Deputy Director of Agriculture (Research), Andhra Pradesh.</td>
</tr>
<tr>
<td><strong>2. Assam, Manipur and Tripura (Shillong)</strong></td>
<td>Shri L.K. Handique, Director of Agriculture, Assam. Shri S. Majid, Director of Agriculture, Assam. Dr. S.R. Barooha, Director of Agriculture, Assam.</td>
</tr>
<tr>
<td><strong>3. Bihar</strong> <em>(Sabour)</em></td>
<td>Dr. R. Richaria, Principal, Agriculture College, Sabour. Shri R.S. Roy, Principal, Agriculture College, Sabour.</td>
</tr>
<tr>
<td><strong>4. Kerala</strong> <em>(Trivandrum)</em></td>
<td>Shri N. Shankara Menon, Director of Agriculture, Kerala. Shri P.D. Nair, Director of Agriculture, Kerala.</td>
</tr>
<tr>
<td><strong>5. Madhya Pradesh</strong> <em>(Gwalior)</em></td>
<td>Dr. T.R. Mehta, Principal, Agriculture College, Gwalior.</td>
</tr>
<tr>
<td><strong>6. Madras</strong> <em>(Coimbatore)</em></td>
<td>Shri C.R. Sheshadri, Vice-Principal &amp; Secretary, Research Council, Agriculture College, Coimbatore. Shri P.A. Venkatesswaram, Vice-Principal &amp; Secretary, Research Council, Agriculture College, Coimbatore. Late Shri M. Bhavani Sankara Rao, Vice-Principal &amp; Secretary, Research Council, Agriculture College, Coimbatore. Shri T. Natarajan, Agronomist &amp; Secretary, Research Council, Agriculture College, Coimbatore. Shri A.H. Sarma, Extension Specialist &amp; Secretary, Research Council, Agriculture College, Coimbatore.</td>
</tr>
<tr>
<td><strong>7. Maharashtra &amp; Gujarat (Former Bombay State)</strong></td>
<td>Shri D.S. Ranga Rao, Statistician, Department of Agriculture, Poona.</td>
</tr>
</tbody>
</table>

Owing to transfers and other changes more than one Regional Supervisors have been shown against several states as these officers have acted as Regional Supervisor during different periods from 1955 to 1962.
8. **MYSORE**
   (BANGALORE)
   **Shri A. Anant Padmanabha Rau,**
   State Statistician, Mysore State.

9. **ORISSA**
   (BHUBANESHWAR)
   **Dr. U.N. Mohanty,**
   Dy, Director of Agriculture (H.Q.), Orissa.

10. **PUNJAB, JAMMU & KASHMIR AND HIMACHAL PRADESH**
    **Shri P.S. Sahota,**
    Statistician, Department of Agriculture, Punjab.

11. **RAJASTHAN**
    (JAIPUR)
    **Shri H.C. Kothari,**
    Statistician, Department of Agriculture, Rajasthan.

12. **UTTAR PRADESH**
    (LUCKNOW)
    **Dr. K. Kishen,**
    Chief Statistician to Govt. of U.P.,
    Department of Agriculture, U.P.

13. **WEST BENGAL**
    (CALCUTTA)
    **Shri S.N. Mukherjee,**
    Statistical Officer,
    Directorate of Agriculture,
    West Bengal.
    **Dr. S. Basu,**
    Statistical Officer,
    Directorate of Agriculture,
    West Bengal.
ABBREVIATIONS COMMON TO EXPERIMENTS ON ANNUAL AND PERENNIAL CROPS AND EXPERIMENTS ON CULTIVATORS' FIELDS

Crop :- 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 wherever 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 :-

A.P. Andhra Pradesh  
As. Assam  
Bh. Bihar  
Di. Delhi  
Gj. Gujarat  
H.P. Himachal Pradesh  
J.K. Jammu & Kashmir  
K. Kerala  
M. Madras  
U. P. Uttar Pradesh  
W.B. West Bengal

Abbreviations adopted for other States are as follows :-

A.P. Andhra Pradesh  
Mn. Manipur  
As. Assam  
Mh. Maharashtra  
Bh. Bihar  
Ms. Mysore  
Di. Delhi  
M.P. Madhya Pradesh  
Gj. Gujarat  
Or. Orissa  
H.P. Himachal Pradesh  
Pb. Punjab  
J.K. Jammu & Kashmir  
Rj. Rajasthan  
K. Kerala  
Tr. Tripura  
M. Madras  
U.P. Uttar Pradesh  
W.B. West Bengal

Repetition of the experiment in other years is indicated in the same line against 'reference' by stating the year and serial number for each repetition side by side e.g. U.P. 53(19)/52(42)/51(20) etc.

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 Indian Agricultural Research Institute.

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.

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

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

Abbreviations used in the text of the experiments :-

ac.—acre.  
Ammo. Phos.—Ammonium Phosphate.  
A/N—Ammonium Nitrate.  
A/S—Ammonium Sulphate.  
B.D.—Basal Dressing.  
B.M.—Bone Meal.  
C.L.—Cart load.  
C.M.—Cattle Manure.  
C/N—Chilean Nitrate.  
C/S—Copper Sulphate.  
F.M.—Fish Meal or Fish Manure.  
F.W.C.—Farm Waste Compost.
(vi)

lb.—Pounds. Super—Super Phosphore.
M.C.—Municipal Compost. T.C.—Town compost.

BASAL CONDITIONS

Information under the above heading to be read against the following items:

A. For 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 (State name of the season along with the month). (x) Date of harvest.

B. For 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 seedling 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.

C. For experiments on cultivator’s 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 per hold. (vii)
       Irrigated or Unirrigated. (viii) Post-sowing/planting cultural operations. (ix) Rainfall during crop season.
       (x) Period of harvesting.

DESIGN

Information under this heading to be read against the following items:

A. For annual crops:
   (i) Abbreviations for designs: C.R.D.—Completely Randomised Design; R.B.D.—Randomised Block Design;
       L. Sq.—Latin Square; Confd.—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 perennial crops:
   (i) Abbreviations for designs: C.R.D.—Completely Randomised Design; R.B.D.—Randomised Block Design;
       L. Sq.—Latin Square; Confd.—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

Information under this heading to be read against the following items:

A. For 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. (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 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>
<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>Gujarati</th>
<th>Hindi</th>
<th>Punjabi</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Paddy</td>
<td>Oryza sativa L.</td>
<td>Dhan</td>
<td>Dhan</td>
<td>Dhano</td>
<td>Vadi, Biyamu</td>
<td>Nel</td>
<td>Nelli</td>
<td>Bhatta</td>
<td>Bhat</td>
<td>Dangar</td>
<td>Chaul</td>
<td>Dhan</td>
</tr>
<tr>
<td>2.</td>
<td>Wheat</td>
<td>Triticum Sativum</td>
<td>Gurm ; Ghehu</td>
<td>Gom ; dhan</td>
<td>Blutta</td>
<td>Macca</td>
<td>Mokka-jouta</td>
<td>Makka-cholam</td>
<td>Cholam</td>
<td>Musukina jola</td>
<td>Makki</td>
<td>Makka</td>
<td>Gahnu</td>
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<tr>
<td>4.</td>
<td>Jowar</td>
<td>Andropogon sorghum</td>
<td>Jowar</td>
<td>Juba ; Jaba</td>
<td>Bari</td>
<td>Sajja</td>
<td>Kambu</td>
<td>Kambu</td>
<td>Sajje</td>
<td>Bajri</td>
<td>Bajri</td>
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<tr>
<td>5.</td>
<td>Barley</td>
<td>Hordeum vulgare L.</td>
<td>Ja'dhan</td>
<td>Juba ; Jaba</td>
<td>Bari</td>
<td>Sajja</td>
<td>Kambu</td>
<td>Kambu</td>
<td>Sajje</td>
<td>Bajri</td>
<td>Bajri</td>
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<tr>
<td>7.</td>
<td>Oats</td>
<td>Avena sativa L.</td>
<td>Jai</td>
<td>Jai ; Jat</td>
<td>Yavalu</td>
<td>ost arisi</td>
<td>Oat</td>
<td>Thoke godhi</td>
<td>Jai</td>
<td>Jav</td>
<td>Jaie</td>
<td>Jau</td>
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<td>8.</td>
<td>Potatoes</td>
<td>Solanum tuberosum L.</td>
<td>Alooguti</td>
<td>Alu</td>
<td>Bangala dumpa</td>
<td>Ureni kilangu</td>
<td>Urala</td>
<td>Alu geeide</td>
<td>Batata</td>
<td>Aloo</td>
<td>Batata</td>
<td>Ala</td>
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<tr>
<td>9.</td>
<td>Carrot</td>
<td>Daucus carota L.</td>
<td>Gajor</td>
<td>Gajor</td>
<td>Gajor</td>
<td>Gajor</td>
<td>Gajor</td>
<td>Gajor</td>
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<td>Gajor</td>
<td>Gajar</td>
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<tr>
<td>10.</td>
<td>Sweet potato</td>
<td>Ipomoea batatas Lam.</td>
<td>Mithi</td>
<td>Alu</td>
<td>Kandamula</td>
<td>Senei kilangu</td>
<td>Chenni</td>
<td>Kirangu</td>
<td>Genasu</td>
<td>Ratala</td>
<td>Shaka</td>
<td>Shaka</td>
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<tr>
<td>11.</td>
<td>Gram</td>
<td>Cicer arietinum L.</td>
<td>Butmash</td>
<td>Chola</td>
<td>Boot</td>
<td>Sanagalu</td>
<td>Kadalai ; Sundal</td>
<td>Kadalai Pataani</td>
<td>---</td>
<td>Kadalai Harbaza</td>
<td>Chana</td>
<td>Chana</td>
<td>Chana</td>
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<tr>
<td>12.</td>
<td>Peas</td>
<td>Pisum arvense L.</td>
<td>Motor</td>
<td>Chota ; Pyramitar</td>
<td>Bada chana</td>
<td>Desavali Baluni</td>
<td>Thota payaru</td>
<td>Manbayar</td>
<td>Alasande</td>
<td>Chavli</td>
<td>Chola ; Choli</td>
<td>Phall</td>
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<tr>
<td>13.</td>
<td>Cowpeas</td>
<td>Vigna castang Walp ; Vigna sinensis Savi</td>
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<td>---</td>
<td>---</td>
<td>Thota payaru</td>
<td>Manbayar</td>
<td>Alasande</td>
<td>Chavli</td>
<td>Chola ; Choli</td>
<td>---</td>
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<td>14.</td>
<td>Sugarcane</td>
<td>Saccharum officinarum L.</td>
<td>Kudhar</td>
<td>Akh</td>
<td>Cherdhu</td>
<td>Karumbu</td>
<td>Katimbu</td>
<td>Kabbu</td>
<td>Oos</td>
<td>Sherdii</td>
<td>Ganna ; Kamad ; Nishikkar</td>
<td>Kasap</td>
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<tr>
<td>Sl. No.</td>
<td>Name of Crop</td>
<td>Botanical name</td>
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<td>Bengali</td>
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<td>Punjab</td>
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<tr>
<td>16</td>
<td>Tobacco</td>
<td>Nicotiana tabacum L.</td>
<td>Dobpat</td>
<td>Tamak</td>
<td>Uanpa</td>
<td>Pogaku</td>
<td>Pugaylai</td>
<td>Pukyila</td>
<td>Hoge soppa</td>
<td>Tambaku</td>
<td>Tamaku</td>
<td>Tambaku</td>
<td>Tamak;</td>
</tr>
<tr>
<td>17</td>
<td>Toria (Indian rape)</td>
<td>Brassica campestris var. toria Duthie</td>
<td>Saraih</td>
<td>Tori saritha</td>
<td>Ava</td>
<td>Kadoogu</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Saras</td>
<td>Saras</td>
<td>Toria</td>
<td>Toria</td>
</tr>
<tr>
<td>18</td>
<td>Sesame</td>
<td>Sesamum indicum L.</td>
<td>Til</td>
<td>Til</td>
<td>Rasi</td>
<td>Nuvulu</td>
<td>Eliu</td>
<td>Yelii</td>
<td>Til, Tili</td>
<td>Tal</td>
<td>Tili</td>
<td>Til</td>
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</tr>
<tr>
<td>19</td>
<td>Linseed</td>
<td>Linum usitatissimum L.</td>
<td>Tiphi</td>
<td>Tishi</td>
<td>Peshe</td>
<td>Avise</td>
<td>Alivithai</td>
<td>Cherucha navhito</td>
<td>Agase</td>
<td>Javas</td>
<td>Aksi</td>
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<tr>
<td>20</td>
<td>Cluster bean (Field Vetch ; guar)</td>
<td>Cynamopsis pseudalata D.C. cyanamopsis tetragonoloba</td>
<td>Thupil urahi</td>
<td>Guar Goals</td>
<td>Gose chhuin</td>
<td>Gormchikkadu</td>
<td>Kotha var-kai ; Sennia var-kai</td>
<td>Kothavara</td>
<td>Gori Kayi</td>
<td>Guwar</td>
<td>Gwar</td>
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<tr>
<td>21</td>
<td>Hubem Clover</td>
<td>Melilotus alba var. annua</td>
<td>—</td>
<td>Sweet banmehi</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Hubem Clover</td>
<td>Berseem</td>
</tr>
<tr>
<td>22</td>
<td>Berseem</td>
<td>Trifolium alexandrinum L.</td>
<td>—</td>
<td>Barseem</td>
<td>Gial</td>
<td>ghaana</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>23</td>
<td>Vicia Sativa (Common Vetch)</td>
<td>Vicia sativa L.</td>
<td>—</td>
<td>Ankari</td>
<td>Ankari</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<td>—</td>
<td>Bakla</td>
<td>—</td>
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<tr>
<td>24</td>
<td>Senji (Indian clover)</td>
<td>Melilotus parviflora Desv.</td>
<td>—</td>
<td>Banmehi</td>
<td>Barmisi</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>25</td>
<td>Panicum anti-dote (Blue Panic)</td>
<td>Panicum Anisodote Retz.</td>
<td>—</td>
<td>Not known</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>26</td>
<td>Jute</td>
<td>Corchorus spp.</td>
<td>Marapat</td>
<td>Shada pat Tosh pat</td>
<td>Jhota</td>
<td>—</td>
<td>Jhunamu</td>
<td>Chanapai</td>
<td>Chanambo</td>
<td>Sanabu</td>
<td>Ioot</td>
<td>Meti Chhombili</td>
<td>Jute</td>
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<tr>
<td>27</td>
<td>Roselle (Mesta)</td>
<td>Hibiscus sabdariffa L.</td>
<td>Tenga Mora</td>
<td>Mesta</td>
<td>Khata Kastria</td>
<td>Erragou</td>
<td>Sveppu Kashamkai</td>
<td>—</td>
<td>Kempu Pundrike</td>
<td>Tambdi ambadi</td>
<td>Patua</td>
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</table>
FOREWORD

PREFACE

LIST OF ABBREVIATIONS

GLOSSARY OF VERNACULAR NAMES OF CROPS

Central Rice Research Institute, Cuttack:
- Proforma giving the details of experimental station
- Experimental Results (Paddy crop)

Jute Agricultural Research Institute, Barrackpore (Calcutta):
- Proforma giving the details of experimental station
- Experimental results (Jute, roselle and mesta)

Central Tobacco Research Institute, Rajahmundry:
- Proforma giving the details of experimental station
- Experimental results (Tobacco)

Indian Agricultural Research Institute, New Delhi:
- Proforma giving the details of experimental station
- Experimental results (crop-wise)
  - Paddy
  - Wheat
  - Maize
  - Jowar
  - Bajra
  - Oats
  - Vegetables (Potato, carrot and sweet potato)
  - Pulses (Gram, peas and cowpeas)
  - Sugarcane
  - Cotton
  - Tobacco
  - Jute
  - Oilseeds (Rape, sesamum and linseed)
  - Fodder crops (Jowar, guar, berseem, etc.)
  - Mixed crops
  - Rotational

Page

(i)

(v)

(viii)

1

2

99

106

107

109

143

145

148

224

266

266

269

273

282

292

300

307

315

316

317

323

338

341
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.
5. Year of establishment. 1946.
6. Distance from nearest railway station with the name of nearest railway station. About 3 miles from Cuttack railway station.
7. Programmes of Research. To undertake fundamental research in all aspects of rice culture, to investigate such problems which have wide application in the country and to serve as a centre of authoritative information on all matters relating to the rice crop.
8. Normal cropping pattern. Rice-Fallow or Rice-Rice.
9. Type of tract it represents. Main rice growing tract.
   (a) Breed soil types. Alluvial (deposits of the river Mahanadi).
   (i) Depth. Very deep. (no parent rock obtained even at a depth of 10 to 12 m.)
   (ii) Colour. Surface soil—ash grey.
   (iii) Structure. Friable.
   (b) Chemical analysis if available with pH value.
   (i) pH. 5.3 to 6.9.
   (ii) Total N. 0.04 to 0.09 percent.
   (iii) Total P. 0.03 to 0.06 percent.
   (iv) NaH CO3 extractable P. 7 to 30 ppm.
   (v) Organic carbon. 0.3 to 1.1 percent (Walkley Black Value).
   K-well supplied with potassium.
   (c) Mechanical analysis (if available).
   (i) Sandy loam. Uplands.
   (iii) Clay and heavy clay—Lowlands.

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<tr>
<td>Average for 10 years 1952—62.</td>
<td>181.3</td>
<td>258.0</td>
<td>338.0</td>
<td>320.1</td>
<td>254.1</td>
<td>41.5</td>
<td>1.5</td>
<td>14.7</td>
<td>28.8</td>
<td>16.1</td>
<td>19.6</td>
<td>64.7</td>
<td>1588.4</td>
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</table>
13. Irrigation facilities available; year from which the facilities were made available. Irrigation facilities are available, from the inception of the Institute.
14. Whether any proper drainage system exists. Yes.
15. Any other information regarding the farm. Location: 20°N, 86°E
   77 feet above sea level.
Object: To find the residual effect of nitrogeous fertilizers.

1. BASAL CONDITIONS:
   (1) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii)
   23.6.1953/21.7.1953. (iv) (a) 4 ploughings, ladderling and levelling. (b) Transplanted. (c) —. (d) N.A.
   (e) 2 to 3. (f) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder
   and one hand-weeding. (ix) 0.00. (a) 27, 28.11.1952.

2. TREATMENTS:
   All combinations of (1) and (2) + a control
   (1) 2 levels of N: N1 = 20 and N2 = 40 lb/ac.
   (2) 4 sources of N: S1 = A/S, S2 = A/N, S3 = Ammo. Phos. and S4 = Urea.

3. DESIGN:
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 8. (iv) (a) 20’ x 12’. (b) 18’ x 10’. (v) 1’ all round. (vi) Yes.

4. RESULTS:
   (i) 1921 lb/ac. (ii) 379.8 lb/ac. (iii) None of the effects is significant.

<table>
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<tr>
<th>Control</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>Mean</th>
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<tr>
<td>N1</td>
<td>1907</td>
<td>1832</td>
<td>1969</td>
<td>1907</td>
<td>1904</td>
</tr>
<tr>
<td>N2</td>
<td>1948</td>
<td>1917</td>
<td>2103</td>
<td>1827</td>
<td>1949</td>
</tr>
<tr>
<td>Mean</td>
<td>1927</td>
<td>1874</td>
<td>2036</td>
<td>1867</td>
<td>1926</td>
</tr>
</tbody>
</table>

S.E. of N marginal mean = 54.8 lb/ac.
S.E. of S marginal mean = 77.5 lb/ac.
S.E. of body of table = 109.6 lb/ac.

Crop: Paddy (Kharif). Ref: C.R.R.I. 52(4). Type: 'M'.

Object: To find the residual effect of nitrogeous fertilizers.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Paddy. (c) As per treatments. (ii) (a) Clayey loam. (b) Refer item 11 on page 1. (iii)
   (ix) 46.02°. (x) 30.11.1953.

2. TREATMENTS:
   All combinations of (1) and (2) + a control
   (1) 2 levels of N: N1 = 20 and N2 = 40 lb/ac.
   (2) 5 sources of N: S1 = A/S, S2 = A/N, S3 = Ammo. Phos., S4 = Ammo. Chloride and S5 = Urea.

3. DESIGN:
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 8. (iv) (a) 1/174.24 ac. (b) 1/236.74 ac. (v) N.A. (vi) Yes.
4. **GENERAL**:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—contd. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (v) and (viii) Nil.

5. **RESULTS**:
   (i) 2723 lb./ac.
   (ii) 459.3 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
<th>Mean</th>
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<td>N1</td>
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<td>2601</td>
<td>2940</td>
<td>2755</td>
<td>2679</td>
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<td>2623</td>
<td>2694</td>
<td>2705</td>
<td>2802</td>
<td>2704</td>
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<tr>
<td>Mean</td>
<td>2736</td>
<td>2612</td>
<td>2772</td>
<td>2730</td>
<td>2785</td>
<td>2727</td>
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</table>

S.E. of N marginal mean = 72.6 lb./ac.
S.E. of S marginal mean = 114.8 lb./ac.
S.E. of body of table = 162.4 lb./ac.

---

**Crop**: Paddy (*Kharij*).  
**Ref**: C.R.R.I. 48(5).  
**Type**: 'M'.

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

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) N.A. (c) N.A. (d) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 1.7.1948/14.8.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) N.A. (v) Nil. (vi) T-812 (medium). (vii) Irrigated. (viii) Weeding on 4.10.1948. (ix) 54.35”. (x) 14.12.1948.

2. **TREATMENTS**:
   All combinations of (1) and (2):
   (1) 3 levels of N as A/S: N0 =0, N1 =20 and N2 =40 lb./ac.
   (2) 3 levels of lime: L0 =0, L1 =4 and L2 =8 cwt./ac.

3. **DESIGN**:
   (i) 3x3 F. in R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) 61.5’x12’. (b) 59.5’x10’. (v) 1 ft. all round. (vi) Yes.

4. **GENERAL**:
   (i) Good. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948—contd. (b) —. (c) N.A. (d) N.A. (e) N.A. (f) Nil. (g) N.A. (h) Nil. (i) Nil.

5. **RESULTS**:
   (i) 2296 lb./ac.
   (ii) 113.4 lb./ac.
   (iii) N effect is highly significant, L effect is significant while interaction N x L is not 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>
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<tbody>
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<td>L0</td>
<td>1918</td>
<td>2306</td>
<td>2471</td>
<td>2232</td>
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<tr>
<td>L1</td>
<td>2110</td>
<td>2348</td>
<td>2430</td>
<td>2296</td>
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<tr>
<td>L2</td>
<td>2132</td>
<td>2415</td>
<td>2503</td>
<td>2360</td>
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<tr>
<td>Mean</td>
<td>2060</td>
<td>2360</td>
<td>2468</td>
<td>2296</td>
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</table>

S.E. of any marginal mean = 32.7 lb./ac.
S.E. of body of table = 56.7 lb./ac.
Crop: Paddy (Kharif),

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 5.7.1949/4.8.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (f) Nil. (v) T-1145 (medium). (vi) Irrigated. (vii) 2-3 weedings with Japanese weeder and hand weeding. (ix) 46.00'. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 3 levels of N as A/S: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac
   (2) 3 levels of lime: L₀ = 0, L₁ = 4 and L₂ = 8 cwt./ac.

3. DESIGN:
   (i) 3x3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 61.5'x12'. (b) 59.5'x10'. (v) 1' all round. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948—contd. (b) Yes. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1975 lb./ac.
   (ii) 240.0 lb./ac.
   (iii) Only N effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<td>Mean</td>
<td>1605</td>
<td>1969</td>
<td>2351</td>
<td>1975</td>
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</table>

S.E. of any marginal mean = 69.2 lb./ac.
S.E. of body of table = 120.0 lb./ac.

Crop: Paddy (Kharif),

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) N.A. (b) Refer item 11 on page 1. (iii) 5.7.1949/2.8.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) and (e) N.A. (vi) Nil. (vii) T-1145 (medium). (viii) Irrigated. (ix) 3 weedings. (x) 64.47'. (xi) N.A.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 3 levels of N as A/S: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
   (2) 3 levels of lime: L₀ = 0, L₁ = 4 and L₂ = 8 cwt./ac.

3. DESIGN:
   (i) 3x3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 61.5'x12'. (b) 59.5'x10'. (v) 1' all round. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Blast incidence observed on 9.9.1950. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 2331 lb./ac.
(ii) 119.2 lb./ac.
(iii) L effect alone is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
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<th></th>
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<th>N₁</th>
<th>N₂</th>
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<tr>
<td>L₀</td>
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<td>2023</td>
<td>1976</td>
<td>2017</td>
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<tr>
<td>L₂</td>
<td>2648</td>
<td>2690</td>
<td>2557</td>
<td>2632</td>
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</table>

Mean    | 2364 | 2330 | 2277 | 2331 |

S.E. of any marginal mean = 35.1 lb./ac.
S.E. of body of table = 59.6 lb./ac.

Crop :- Paddy (Kharif).
Ref. :- C.R.R.I. 51(3).
Type :- 'M'.

Object :- To study the effect of continuous application of A/S with and without lime on Paddy crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1.
(iii) 17.6.1951/18.6.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) Nil. (e) Nil. (f) As per treatments. (g) T-1145 (medium). (h) Irgised. (i) Weeding on 5.9.1951.

2. TREATMENTS:

(i) N as A/S : N₀ =0, N₁ =20 and N₂ =40 lb./ac.
(ii) 3 levels of lime : L₀ =0, L₁ =4 and L₂ =8 cwt./ac.

Fertilizers applied on 9.8.1951.

3. DESIGN:

(i) 3X3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 64.5'X12'. (b) 59.5'X10'. (v) 1' all round. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield.
(iv) (a) 1948—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 2544 lb./ac.
(ii) 140 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

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<td>L₂</td>
<td>2348</td>
<td>2560</td>
<td>2708</td>
<td>2339</td>
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Mean    | 2186 | 2327 | 717  | 2344 |

S.E. of any marginal mean = 40.6 lb./ac.
S.E. of body of table = 70.4 lb./ac.
Crop :: Paddy (Kharif).  Ref :: C.R.R.I. 52(2).  Type :: 'M'.

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item II on page 1. (iii) 18.6.1952/29.7.1952. (iv) (a) 4 ploughings, ladderling and levelling. (b) Bulk planting. (c) —. (d) 6"x6". (e) 2-3 seedlings/hole. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2-3 weedings with Japanese weeder and hand weeder. (ix) 36.03". (x) 2.12.1952.

2. TREATMENTS:
   2 strips in one direction:
   9 strips in perpendicular direction to the first 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.

3. DESIGN:
   (i) Strip-plot. (ii) (a) 2 strips in one direction and 9 strips in its perpendicular direction. (b) N.A. (iii) 4. (iv) (a) 30'x12', (b) 28'x10'. (v) 1 ft. around. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948-1950. (modified this year). (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2087 lb./ac.
   (ii) (Compost) = 314.9 lb./ac.
   (Line and N) = 224.0 lb./ac.
   (Interaction) = 194.0 lb./ac.
   (iii) N effect is highly significant, interaction CxN 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>L_0</th>
<th>L_1</th>
<th>L_2</th>
</tr>
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<tbody>
<tr>
<td>C_0</td>
<td>1629</td>
<td>1974</td>
<td>2314</td>
<td>1972</td>
<td>2039</td>
<td>1921</td>
<td>1957</td>
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<td>C_1</td>
<td>1961</td>
<td>2267</td>
<td>2373</td>
<td>2203</td>
<td>2273</td>
<td>2135</td>
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<tr>
<td>Mean</td>
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<td>2121</td>
<td>2543</td>
<td>2087</td>
<td>2156</td>
<td>2028</td>
<td>2077</td>
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<tr>
<td>L_0</td>
<td>1855</td>
<td>2171</td>
<td>2641</td>
<td>2087</td>
<td>2156</td>
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<td>2077</td>
</tr>
<tr>
<td>L_1</td>
<td>1784</td>
<td>1995</td>
<td>2304</td>
<td>2087</td>
<td>2156</td>
<td>2028</td>
<td>2077</td>
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<tr>
<td>L_2</td>
<td>1745</td>
<td>2196</td>
<td>2286</td>
<td>2087</td>
<td>2156</td>
<td>2028</td>
<td>2077</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. C marginal means = 80.6 lb./ac.
2. N or L marginal means = 66.7 lb./ac.
3. N or L means at the same level of C = 83.5 lb./ac.
4. C means at the same level of N or L = 113.5 lb./ac.
5. means in body of N and L table = 112.0 lb./ac.
Crop: Paddy (Kharif).  
Ref.: C.R.R.I. 53(3).  
Type: 'M'.

Object --- To study the effect of continuous application of A/S with and without compost and lime on Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments.  
   (ii) (a) Clay loam. (b) Refer item 11 on page 1.  
   (iii) 2.6.1953/28.7.1953.  
   (iv) (a) 4 ploughings, lading and levelling. (b) Transplanted. (c) 6"x6".  
   (e) 2-3 seedlings per hole. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated.  
   (viii) Weeding on 5.9.53. (ix) 46.02" (x) 23, 24.11.1953.

2. TREATMENTS:
   2 strips in one direction:
   2 levels of compost: C_0 = 0 and C_1 = 100 md./ac.
   9 strips in perpendicular direction to the first 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.

3. DESIGN:
   (i) Strip-plot. (ii) (a) 2 strips in one direction and 9 strips in the perpendicular direction. (b) N.A. (iii) 4, 1948—contd. (b) Yes. (c) N.A.  
   (v) (a) 20'x12'. (b) 20'x10'. (c) 6'x6'. (d) 2-3 seedlings per hole. (e) Nil.  
   (vi) Yes. (vii) Weeding on 5.9.53. (viii) Irrigated.  
   (ix) 46.02" (x) 23, 24.11.1953.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield.  
   (iv) 1948—contd. (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2894 lb./ac.
   (ii) (Compost) = 18.4 lb./ac.
   (Lime and N) = 393.2 lb./ac.
   (Interaction) = 305.3 lb./ac.
   (iii) C and N effects and interaction C\times N are 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>L_0</th>
<th>L_1</th>
<th>L_2</th>
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<td>3262</td>
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<td>C_1</td>
<td>3007</td>
<td>3202</td>
<td>3163</td>
<td>3124</td>
<td>3144</td>
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<td>2632</td>
<td>3001</td>
<td>2640</td>
<td>3124</td>
<td>3144</td>
<td>3000</td>
</tr>
<tr>
<td>L_2</td>
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<td>3174</td>
<td>3264</td>
<td>2980</td>
<td>2758</td>
<td>3046</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. C marginal means = 62.76 lb./ac.
2. L or N marginal means = 87.53 lb./ac.
3. L or N means at the same level of C = 131.6 lb./ac.
4. C means at the same level of L or N = 104.5 lb./ac.
5. means in the body of N x L table = 131.6 lb./ac.
Crop: Paddy (Kharif)

Ref: C.R.R.I. 53 (18).  Type: 'M'.

Object: To study the effect of growing and incorporating dhaincha on Paddy yield.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Paddy.  (c) N.A.  (iii) (a) Clay loam.  (b) Refer item 11 on page 1.  (iii) 22.6.1953.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Broadcast.  (c) 60 lb./ac.  (d) and (e) —.  (v) Nil.  (vi) T-124 (late).  (vii) Irrigated.  (viii) 2-3 intercultures with Japanese weeder and one hand weeding.  (ix) 46.2°.  (x) 22.11.1953.

2. TREATMENTS:

   T1 = Control (no manure).
   T2 = 20 lb./ac. of N as dhaincha.
   T3 = Dhaincha + 20 lb./ac. of N as A/S.
   T4 = Dhaincha + 50 lb./ac. of P2O5.
   T5 = Dhaincha + 50 lb./ac. of P2O5 + 20 lb./ac. of N as A/S.

6 to 8 weeks old dhaincha ploughed in situ at the time of busheling.

3. DESIGN:

   (i) R.B.D.  (ii) (a) 5.  (b) N.A.  (iii) 4.  (iv) (a) 16'x64'.  (b) 14'x62'.  (v) 1' around.  (vi) Yes.

4. GENERAL:

   (i) Good.  (ii) Nil.  (iii) Height, tillers and ear-length measurements, straw and grain yield.  (iv) (a) 1950—contd.  (b) N.A.  (c) N.A.  (v) (a), (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:

   (i) 2644 lb./ac.
   (ii) 254.9 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of grain in lb./ac.

   Treatment  Av. yield  
   T1    2023  
   T2    2724  
   T3    2636  
   T4    2591  
   T5    2847  
   S.E./mean = 127.5 lb./ac.

---

Crop: Paddy (Kharif)

Ref: C.R.R.I. 53(17).  Type: 'M'.

Object: To find the manurial value of different G.M. and leguminous crops grown in situ or bought from outside.

1. BASAL CONDITIONS:

   (i) (a) Nil.  (b) Paddy.  (c) N.A.  (iii) (a) Clay loam.  (b) Refer item 11 on page 1.  (iii) 22.6.1953/30.7.1953.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanted.  (c) —.  (d) 10'x5', (e) 2 to 3 seedlings.  (v) Nil.  (vi) T-141 (medium).  (vii) Irrigated.  (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding.  (ix) 46.02°.  (x) 9 12.1953.

2. TREATMENTS:

   1. Dhaincha grown in situ.
   2. Sesbania Spectans grown in situ.
   5. C. Streptata grown in situ.
   8. Compost.
   9. Cassia leaf brought from outside.
   10. Dhaincha leaf brought from outside.
   11. A/S at 20 lb./ac of N.
   12. Control.

3. DESIGN:

   (i) R.B.D.  (ii) (a) 12.  (b) N.A.  (iii) 4.  (iv) (a) 20'x15'.  (b) 18'-4'x14'.  (v) 10'x12'.  (vi) Yes.

4. GENERAL:

   (i) Satisfactory.  (ii) N.A.  (iii) Height, tiller and ear-length measurements and straw and grain yield.  (iv) (a) 1953 —N.A.  (b) N.A.  (c) N.A.  (v) (a), (b) Nil.  (vi), (vii) Nil.
5. RESULTS:
(i) 3446 lb./ac.
(ii) 168.5 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>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3716</td>
<td>7.</td>
<td>3428</td>
</tr>
<tr>
<td>2.</td>
<td>3206</td>
<td>8.</td>
<td>3265</td>
</tr>
<tr>
<td>3.</td>
<td>3886</td>
<td>9.</td>
<td>3482</td>
</tr>
<tr>
<td>4.</td>
<td>3526</td>
<td>10.</td>
<td>3598</td>
</tr>
<tr>
<td>5.</td>
<td>3353</td>
<td>11.</td>
<td>3738</td>
</tr>
<tr>
<td>6.</td>
<td>3232</td>
<td>12.</td>
<td>3279</td>
</tr>
</tbody>
</table>

S.E./mean = 4.3 lb./ac.

Crop: - Paddy (Kharif), Ref: C.R.R.I. 53(16), Type: 'M'.

Object: - To compare the effect of burying dhaincha on different dates.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1953/17.7.1953.
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c). (d) N.A. (e) 2 to 3. (v) NIl. (vi) T-141 (medium). (vii) Irrigated. (viii) 2-3 interculturals with Japanese weeder and one hand weeding. (ix) 46.02°. (x) 21.11.1953.

2. TREATMENTS:
T1 = Burying dhaincha on 1.5.1953.
T2 = Burying dhaincha on 1.6.1953.
T3 = Burying dhaincha on 1.7.1953.
T4 = Burying compost on 15.7.1953.
T5 = Burying compost on 15.7.1953 prepared from green matter on 1.5.1953.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 3'x20'. (b) 25'4"x18'6". (v) 10'x9'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Height, tiller and ear-length measurement, straw and grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 3230 lb./ac.
(ii) 121.0 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
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<td>T2</td>
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<td>T3</td>
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<td>T4</td>
<td>3826</td>
</tr>
<tr>
<td>T5</td>
<td>3845</td>
</tr>
<tr>
<td>T6</td>
<td>3544</td>
</tr>
</tbody>
</table>

S.E./mean = 60.5 lb./ac.

Crop: - Paddy (Kharif), Ref: C.R.R.I. 53(21), Type: 'M'.

Object: - To compare different methods of application of A/S.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c). (d) NIl. (e) 2 to 3. (v) Nil. (vi) PTB 10 (late). (vii) Irrigated. (viii) 2 to 3 interculturals with Japanese weeder and one hand weeding. (ix) 46.02°. (x) 20.4.1954.
2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N as A/S applied before planting and puddled in.
3. Treatment 2+10 lb./ac. of N as A/S applied as pillets 3 weeks afterwards.
4. 20 lb./ac. of N as A/S applied as pillets 3 weeks after planting.
5. 20 lb./ac. of N as A/S broadcast 3 weeks after transplanting.

3. DESIGN:
(i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 24'×3', (b) 14.5'×4'. (v) 49'×6'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Height and tiller measurements and straw and grain yield. (iv) (a) 1911—contd. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1995 lb./ac.
(ii) 166.0 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>1.</td>
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</tr>
<tr>
<td>2.</td>
<td>2125</td>
</tr>
<tr>
<td>3.</td>
<td>2148</td>
</tr>
<tr>
<td>4.</td>
<td>2110</td>
</tr>
<tr>
<td>5.</td>
<td>1896</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=67.77 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Paddy. (Kharif). Ref :- C.R.R.I. 53(20). Type :- 'M'.

Object :-To compare different methods of application of A/S.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 28.7.1953.
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 10'×6'. (e) 2 to 3. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) 1-3 intercultures with Japanese weeder and one hand weeding.

2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N applied before planting and puddled in.
3. 20 lb./ac. of N smeared on roots.
4. 20 lb./ac. of N applied as pillets one month after planting.
5. 20 lb./ac. of N broadcast one month after planting.

3. DESIGN:
(i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 15'×5.83'. (b) 14.5'×4.17'. (v) 9' around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Height and tiller measurement, straw and grain yield. (iv) (a) 1953—contd. (b) —. (c) —. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2840 lb./ac.
(ii) 295.4 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>3011</td>
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<tr>
<td>3.</td>
<td>2622</td>
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<tr>
<td>4.</td>
<td>3191</td>
</tr>
<tr>
<td>5.</td>
<td>2795</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=120.6 lb./ac.</td>
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</tbody>
</table>
Crop: Paddy (Kharif).  Ref: C.R.R.I. 58(16).  Type: 'M'.

Object:—To study the effect of deep layering of A/S.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Paddy.  (c) M.A.  (ii) (a) Clay loam.  (b) Refer item 11 on page 1.  (iii) 20.7.1950.  (iv) (a) 3 to 4 ploughings, laddering and levelling.  (b) Transplanted.  (c) —.  (d) 5' x 6'.  (e) 2 to 3.  (v) Nil.  (vi) CO. 13 (early).  (vii) Irrigated.  (viii) 2 to 3 intercultures with Japanese weeder.  (ix) 64.47'.  (x) 14.10.1950.

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb./ac. of N as A/S broadcasted on 28.7.1950.
   3. 40 lb./ac. of N as A/S broadcasted on 28.7.1950.
   4. 20 lb./ac. of N as A/S deep layered on 28.7.1950.
   5. 40 lb./ac. of N as A/S deep layered on 28.7.1950.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 5'.  (b) 35' x 20'.  (iii) 9'.  (iv) (a) 20' x 6'.  (b) 19' x 5'.  (v) 6' x 4.5'.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  (ii) Helminthosporium attack was observed on seeds.  2–3 seeds are attacked in most of the panicles.  (iii) Height measurement and number of tillers, effective tillers per plant at time of harvest, straw and grain yield.  (iv) (a) No.  (b) —.  (c) —.  (v) (a) and (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1955 lb./ac.
   (ii) 145.9 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of grain in lb./ac.

   Treatment  Av. yield
   1.  1747
   2.  1882
   3.  2035
   4.  2009
   5.  2101

   S.E./mean = 84.6 lb./ac.

Crop: Paddy (Kharif).  Ref: C.R.R.I. 51(14).  Type: 'M'.

Object:—To compare the efficiency of deep layer application of A/S with that of surface application.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Paddy.  (c) N.A.  (ii) (a) N.A.  (b) Refer item 11 on page 1.  (iii) 13.6.1951/2.8.1951.  (iv) (a) 2-3 ploughings, laddering and levelling.  (b) Transplanted.  (c) —.  (d) Bulk planting.  (e) 2–3.  (v) Nil.  (vi) T-90 (late).  (vii) Irrigated.  (viii) 2 to 3 intercultures with Japanese weeder and one hand-weeding.  (ix) 65.32'.  (x) 21.12.1951.

2. TREATMENTS:
   1. Control (no manure).

3. DESIGN:
   (i) R.B.D.  (ii) (a) 3'.  (b) 66' x 66'.  (iii) 6.  (iv) (a) 66' x 22'.  (b) 64' x 20'.  (v) 1' around.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  (ii) N.A.  (iii) Grain and straw yield.  (iv) (a) No.  (b) —.  (c) —.  (v) (a) Fakirpada and Nimetaipur (intensive cultivation centres).  (b) N.A.  (vi) and (vii) Nil.
5. RESULTS:

(i) 2662 lb./ac.
(ii) 78.2 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
<td>2768</td>
</tr>
<tr>
<td>3.</td>
<td>2676</td>
</tr>
</tbody>
</table>

S.E. /mean = 31.92 lb./ac.

Crop: Paddy (Kharif). Ref: C.R.R.I. 51(9). Type: 'M'.

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 item 11 on page 1. (iii) 17.6.1951/27.7.1951.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (f) Nil. (v) T 1342 (late). (vi) (vii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.3°. (x) 6.12.1951.

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: A₀ = 0, A₁ = 15 and A₂ = 30 lb./ac.

3. DESIGN:
   (i) 4 x 3 Fact. in R.R.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 19' x 30'. (b) 17' x 28'. (v) 1' alround. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1951—contd. (b) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 4321 lb./ac.
   (ii) 210.5 lb./ac.
   (iii) Interaction C x A is highly significant. C effect is significant. A effect is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C₀</th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
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<td>Mean</td>
<td>3163</td>
<td>3282</td>
<td>3226</td>
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S.E. of C marginal means = 60.8 lb./ac.
S.E. of A marginal means = 52.6 lb./ac.
S.E. of body of table = 105.2 lb./ac.
Crop: Paddy (Kharif).
Ref.: C.R.R.I. 52(9). Type: ‘M’.

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 item 11 on page 1. (iii) 18.6.1952/31.8.1952.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1242 (late).
   (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 56.0°. (x) 12.12.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N as compost: \( C_0 = 0, C_1 = 30, C_2 = 60 \) and \( C_3 = 90 \) lb./ac.
   (2) 3 levels of N as A/S: \( N_0 = 0 \), \( N_1 = 15 \) and \( N_2 = 30 \) lb./ac.

3. DESIGN:
   (i) 4x3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 19’x30’. (b) 17’x28’. (v) 1’ border around. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Height and ear-length measurements. No. of tillers, straw and grain yield.
   (iv) (a) 1951 — contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3019 lb./ac.
   (ii) 317.0 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( C_0 )</th>
<th>( C_1 )</th>
<th>( C_2 )</th>
<th>( C_3 )</th>
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<td>2973</td>
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<td>3007</td>
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<tr>
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<tr>
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</table>

S.E. of C marginal means = 91.5 lb./ac.
S.E. of N marginal means = 79.2 lb./ac.
S.E. of body of table = 158.5 lb./ac.

Crop: Paddy (Kharif).

Object: To study the response of Paddy to organic and inorganic measures.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1952/31.8.1952.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1242 (late).
   (vii) Irrigated. (viii) 2 and 3 intercultures with Japanese weeder and one hand weeding. (ix) 46.0°. (x) 21.12.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N as compost: \( C_0 = 0, C_1 = 30, C_2 = 60 \) and \( C_3 = 90 \) lb./ac.
   (2) 3 levels of N as A/S: \( N_0 = 0 \), \( N_1 = 15 \) and \( N_2 = 30 \) lb./ac.

3. DESIGN:
   (i) 4x3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 19’x30’. (b) 17.3’x28.3’. (v) 1 row all round.
   (vi) Yes.
4. GENERAL:
(i) Good. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1951—contd. (b) No. (c) N.A. (vi) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 3639 lb./ac.
(ii) 290.5 lb./ac.
(iii) N.A. is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C_0</th>
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<th>C_2</th>
<th>C_3</th>
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<td>3669</td>
<td>3603</td>
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<tr>
<td>N_2</td>
<td>3791</td>
<td>3908</td>
<td>3962</td>
<td>3842</td>
<td>3851</td>
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<tr>
<td>Mean</td>
<td>3451</td>
<td>3610</td>
<td>3732</td>
<td>3761</td>
<td>3639</td>
</tr>
</tbody>
</table>

S.E. of C marginal means = 83.9 lb./ac.
S.E. of N marginal means = 72.6 lb./ac.
S.E. of body of table = 145.3 lb./ac.

Crop = Paddy ('Kharif'). Ref = C.R.R.I. 48(2). Type = 'M'.

Object:—To find out the effects of P_2O_5 applied in different ways on Paddy yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item II on page 1. (iii) 24.6.1948/3.8.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Nil. (c) and (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-812 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 5.12.1948.

2. TREATMENTS:
T_1 = Super at 30 lb./ac. of P_2O_5 broadcast on surface of the puddled and leveled land and transplanting done.
T_2 = Puddling, draining of water, making furrows with country plough and then applying 30 lb./ac. of P_2O_5 as Super in furrows.

3. DESIGN:
(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 60'x8'. (b) 55'x6'. (v) 1' around. (vi) Yea.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1948 to 1951. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2587 lb./ac.
(ii) 62.9 lb./ac.
(iii) Treatment difference is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T_1</td>
<td>2592</td>
</tr>
<tr>
<td>T_2</td>
<td>2582</td>
</tr>
</tbody>
</table>

S.E./mean = 25.68 lb./ac.
Crop :- Paddy (Kharif)  
Ref :- C.R.R.I. 49 (5).  
Type :- 'M'.

Object :- To study the best time and method of application of P2O5 to Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Biri. (c) N.A. (iii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 1.7.1949/5.6.1949.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil.
   (v) N-136. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00'.
   (x) 25, 26.10.1949.

2. TREATMENTS:
   T1 = Biri crop+30 lb. P2O5 applied to Biri. T2 = Biri crop+no P2O5 applied to Biri. T3 = Biri crop+30 lb.
   P2O5 just before transplanting paddy. T4 = Fallow+30 lb. P2O5 at the time of sowing Biri. T5 = Fallow+no
   P2O5. T6 = Fallow+30 lb. P2O5 just before transplanting paddy.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) 62' x 19.5'. (b) 56' x 17.5'. (v) 3' x 1'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield.
   (iv) (a) 1948 to 1951. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 68.7 lb/ac.
   (ii) N.A.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb/ac.

   Treatment    | Av. yield
   --------------|----------
   T1            | 708.1
   T2            | 593.4
   T3            | 709.3
   T4            | 513.4
   T5            | 551.2
   T6            | 655.6

Crop :- Paddy (Kharif)  
Ref :- C.R.R.I. 50(6).  
Type :- 'M'.

Object :- To study the effect of P2O5, applied directly and through moong, on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1950/12.7.1950.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi)
   Beni Bhog (early). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding
   (ix) 64.47'. (x) 13.10.1950.

2. TREATMENTS:
   T1 = Moong+50 lb/ac of P2O5 as Super at sowing of moong. T2 = Moong alone. T3 = Moong+50 lb/ac of
   P2O5 as Super at transplanting of Paddy. T4 = Fallow+50 lb/ac of P2O5 as Super at the time when moong
   was sown in other plots. T5 = Fallow. T6 = Fallow+50 lb/ac of P2O5 as Super at transplanting of Paddy.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 62' x 14'. (b) 60' x 12' (v) 1' all round. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield.
   (iv) (a) 1948 to 1951. (b) No. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1194 lb/ac.
   (ii) 175.3 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>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
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</tr>
<tr>
<td>T2</td>
<td>1107</td>
</tr>
<tr>
<td>T3</td>
<td>1320</td>
</tr>
<tr>
<td>T4</td>
<td>1119</td>
</tr>
<tr>
<td>T5</td>
<td>1283</td>
</tr>
</tbody>
</table>

S.E./mean = 87.65 lb./ac.

Crop: Paddy (*Kharif*).  Ref: C.R.R.I. 51(5). Type: 'M'.

Object: To study the effect of P\textsubscript{2}O\textsubscript{5} applied directly and through moong, on the yield of Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) N.A. (iii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 13.6.1951/22.7.1951.

(ii) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) ---. (d) N.A. (e) 2-3. (vi) Vegetative (early). (viii) Irrigated. (vii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32'. (x) 24, 25.10.1951.

2. TREATMENTS:

T\textsubscript{1} = Moong+50 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super at sowing of moong, T\textsubscript{2} = Moong alone, T\textsubscript{3} = Moong+50 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super at transplanting of Paddy, T\textsubscript{4} = Fallow+50 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super at the time when moong was sown in other plots, T\textsubscript{5} = Fallow, T\textsubscript{6} = Fallow+50 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super at transplanting of Paddy.

3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 62' x 14'. (b) 60' x 12'. (v) 1' all around. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Free from disease. (iii) Height and ear-length measurements, no. of tillers and straw and grain yield. (iv) (a) 1948-1951. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1772 lb./ac.

(ii) 164.6 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>
</tr>
</thead>
<tbody>
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<td>T4</td>
<td>1900</td>
</tr>
<tr>
<td>T5</td>
<td>1585</td>
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<tr>
<td>T6</td>
<td>1608</td>
</tr>
</tbody>
</table>

S.E./mean = 62.3 lb./ac.

Crop: Paddy (*Kharif*).  Ref: C.R.R.I. 49(11). 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:

(a) Nil. (b) Paddy. (c) N.A. (iii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 7.3.1949/2.8.1949.

(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted and bulk planted. (c) ---. (d) ---. (e) 2-3. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 45'. (x) 7.12.1949.
2. TREATMENTS:

Main-plot treatments:
2 levels of compost: \( C_0 = 0 \) and \( C_1 = 100 \) md/ac

Sub-plot treatments:
5 levels of N as A/S: \( N_0 = 0 \), \( N_1 = 20 \), \( N_2 = 40 \), \( N_3 = 60 \) and \( N_4 = 80 \) lb/ac.

3. DESIGN:

(i) Split-plot. (ii) 2 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 60' x 10.5'. (b) 38' x 8.5'. (v) 1' all round. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Blast incidence in heavily manured plots. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) —. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1773 lb/ac.
(ii) (a) 242.4 lb/ac.
(b) 191.5 lb/ac.
(iii) N effect is highly significant. Interaction C x N is significant. C effect is not significant.
(iv) Av. yield of grain in lb/ac.

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<tr>
<th>N</th>
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<td>1896</td>
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<td>1760</td>
<td>2044</td>
<td>1897</td>
<td>1528</td>
<td>1773</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. C marginal means = 76.7 lb/ac.
3. N means at the same level of C = 140.3 lb/ac.
4. C means at the same level of N = 147.1 lb/ac.

Crop: Paddy (Kharif). Ref: C.R.R.I. 50(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) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 30.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and hand weeder. (ix) 64.47'. (x) N.A.

2. TREATMENTS:

Main-plot treatments:
2 levels of compost: \( C_0 = 0 \) and \( C_1 = 100 \) md/ac.

Sub-plot treatments:
5 levels of N as A/S: \( N_0 = 0 \), \( N_1 = 20 \), \( N_2 = 40 \), \( N_3 = 60 \) and \( N_4 = 80 \) lb/ac.

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 60' x 10.5'. (b) 38' x 8.5'. (v) 1' all round. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Blast incidence in heavily manured plots. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 2421 lb./ac.
(ii) (a) 454.0 lb./ac.
(b) 368.9 lb./ac.
(iii) N effect alone is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>N3</th>
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<td>2778</td>
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<td>2087</td>
<td>2024</td>
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<td>2651</td>
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<td>2217</td>
<td>2243</td>
<td>2421</td>
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</tbody>
</table>

S.E. of difference of two
1. C marginal means = 143.6 lb./ac.
2. N marginal means = 184.4 lb./ac.
3. N means at the same level of C = 260.9 lb./ac.
4. C means at the same level of N = 273.9 lb./ac.

Crop : Paddy (Kharif).
Ref : C.R.R.I. 51(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) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1.
(iii) 17.6.1951/30.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) and (e) N.A. (vi) Nil. (vii) T-1145 (medium). (viii) Irrigated. (ix) 2 weedings. (x) 5.32'. (x) 29.11.1951.

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

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 60’x10.5’. (b) 58’x8.5’. (v) 1’ all round. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Blast incidence in heavily manured plots. (iii) Height and ear-length measurements, No. of tillers, straw and grain yield. (iv) (a) 1949 — contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2135 lb./ac.
(ii) (a) 351.2 lb./ac.
(b) 217.4 lb./ac.
(iii) N and N×C effects are highly significant. C effect is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
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Crop: Paddy (Kharif). Ref: C.R.R.I. 52(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) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1955/31.7.1952. (iv) (a) 4 ploughings, ladderling and levelling. (b) Bulk planting. (c). (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-1115 (medium). (vii) Irrigated. (viii) 2 and 3 intercultures with Japanese weeder and hand weeder. (ix) 56.0'. (x) 25.11.1952.

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

3. DESIGN:
   (i) Sp J-plot. (ii) (a) 2 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4.4 (iv) a) 60' x 10.5'. (b) 58' x 8.5'. (v) I' alround. (vi) Yes.

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

5. RESULTS:
   (i) 2100 lb./ac.
   (ii) (a) 164.4 lb./ac.
   (b) 217.4 lb./ac.
   (iii) Interaction C x N is highly significant. N effect is highly significant. C is not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
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<th>N2</th>
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<td>2254</td>
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S.E. of difference of two
1. C marginal means = 52.0 lb./ac.
2. N marginal means = 108.7 lb./ac.
3. N means at the same level of C = 153.7 lb./ac.
4. C means at the same level of N = 146.9 lb./ac.
Crop: Paddy (Kharif).

Ref: C.R.R.I. 53(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) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1953/26.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) - (d) 10' x 6'. (e) 2 to 3. (v) Nil. (vi) T = 1145 (medium). (vii) 2 weedings with Japanese double weeder and 1 weeding with hand weeder. (ix) 1940. (x) 2, 1.12.1953.

2. TREATMENTS:

Main-plot treatments:
- 2 levels of compost: C0 = 0 and C1 = 100 lb/ac.

Sub-plot treatments:
- 5 levels of N as A/S: N0 = 0, N1 = 20, N2 = 40, N3 = 60 and N4 = 80 lb/ac.

3. DESIGN:

(i) Split-split-plot. (ii) 2 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 1 row around. (vii) Yes.

4. GENERAL:

(i) Good. Serious lodging in heavily manured plots on 20.10.1953. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. RESULTS:

(i) 2921 lb/ac.

(ii) (a) 244.2 lb/ac.

(b) 299.0 lb/ac.

(iii) N effect and interaction C x N are highly significant. C effect is not significant.

(iv) Av. yield of grain in lb/ac.

<table>
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<tr>
<th></th>
<th>N0</th>
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S.E. of difference of two

1. C marginal means = 77.2 lb/ac.
2. N marginal means = 149.5 lb/ac.
3. N means at the same level of C = 211.4 lb/ac.
4. C means at the same level of N = 204.2 lb/ac.

Crop: Paddy (Kharif).

Ref: C.R.R.I. 50(5). Type: 'M'.

Object: To study the response of Paddy to dhaincha and A/S.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1950/31.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) - (d) N.A. (e) 2 to 3. (v) Nil. (vi) T = 90. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47. (x) 20.12.1950.

2. TREATMENTS:

All combinations of (1) and (2)

(i) 4 levels of N as A/S: N0 = 0, N1 = 20, N2 = 40 and N3 = 30 lb/ac.

(ii) 4 levels of N as dhaincha: D0 = 0, D1 = 10, D2 = 20 and D3 = 30 lb/ac.
3. DESIGN:
   (i) 4x4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 14'x31.5'. (b) 12'x29.5'. (v) 1' all round. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) No. (b), (c) No. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2577 lb./ac. 
   (ii) 198.1 lb./ac. 
   (iii) Effects of N and D are highly significant while interaction is not significant. 
   (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
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S.E. of any marginal mean = 49.5 lb./ac. 
S.E. of body of the table = 99.1 lb./ac.

Crop: Paddy (Kharif). 
Ref: C.R.R.I. 51(4). 
Type: 'M'.

Object: To study the response of Paddy to dhaincha and A/S.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1951/3.8.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-90, (late) (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32°E. (a) 15, 16.12.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N as A/S: N0 =0, N1 =10, N2 =20 and N3 =30 lb./ac.
   (2) 4 levels of N as dhaincha: D0 =0, D1 =10, D2 =20 and D3 =30 lb./ac.

3. DESIGN:
   (i) 4x4 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 14'x31.5'. (b) 12'x29.5'. (v) 1' all round. (vi) Yes.

4. GENERAL:
   (i) Very satisfactory. (ii) Nil. (iii) Straw, height, tillers, ear-length and yield. (iv) (a) 1930-contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2725 lb./ac. 
   (ii) 120.6 lb./ac. 
   (iii) Effects of N and D are highly significant while interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
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S.E. of any marginal mean = 30.2 lb./ac.
S.E. of body of table = 60.3 lb./ac.

Crop :- Paddy (Kharif).
Ref:- C.R.R.I. 52(3). Type :- 'M'.

Object :- To study the response of Paddy to dhanicha and A/S.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A.  (ii) (a) Clay loam.  (b) Refer item 11 on page 1.  (iii) 16.6.1952/31.7.1952.  (iv) (a) 4 ploughings, laddering and leveling.  (b) Transplanted.  (c) —.  (d) N.A.  (e) 2-3.  (v) Nil.  (vi) T-90 (late).  (vii) Irrigated.  (viii) 2-3 intercultur with Japanese weeder and one hand weeding.  (ix) 56.03°.  (x) 18.12.1952.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 4 levels of N as A/S: N₀=0, N₁=10, N₂=20 and N₃=30 lb./ac.
   (2) 4 levels of N as dhanicha : D₀=0, D₁=10, D₂=20 and D₃=30 lb./ac.

3. DESIGN :
   (i) 4×4 Fact. in R.B.D.  (ii) (a) 16.  (b) N.A.  (iii) 4.  (iv) (a) 14'×21'.  (b) 10'×19'.  (v) 2'×1'.  (vi) Yes.

4. GENERAL :
   (i) Good.  (ii) Nil.  (iii) Height and ear-length measurements, no. of tillers, straw and grain yield.  (iv) (a) 1950—contd.  (b) No.  (c) N.A.  (v) (a) and (b) Nil.  (vi) and (vii) Nil.

5. RESULTS :
   (i) 2431 lb./ac.
   (ii) 255.1 lb./ac.
   (iii) Effects of N and D are highly significant while interaction is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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S.E. of any marginal mean = 63.8 lb./ac.
S.E. of body of table = 127.5 lb./ac.
Crop: Paddy (Kharif).  
Object:—To study the response of Paddy to dhaincha and A/S.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (b) Ref: item 11 on page 1. (ii) 23.6.1953/5.8.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) Nil. (v) Nil. (vi) T-90 (late). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 22.2.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N as A/S: A0=0, A1=10, A2=20 and A3=30 lb/ac.
   (2) 4 levels of N as dhaincha: D0=0, D1=10, D2=20 and D3=30 lb/ac.

3. DESIGN:
   (i) 4 x 4 Fact. in R.B.D. (ii) (a) N.A. (iii) 4. (iv) (a) 14’x21’. (b) 12’x19’.
   (v) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Height and ear length measurements, no. of tillers, straw and grain yield. (iv) (a) 1950—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3013 lb/ac. (ii) 229.0 lb/ac. (iii) Effect of A and D is highly significant while interaction is not significant. (iv) Av. yield of grain in lb/ac.

<table>
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<th></th>
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Mean: 2760 3022 3168 3182 3033

S.E. of any marginal mean = 57.3 lb/ac.
S.E. of body of table = 114.5 lb/ac.

Crop: Paddy (Kharif).  
Object:—To study the effects of deep layering and surface application of A/S at different levels on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Ref: item 11 on page 1. (iii) 2.1.1951/8.2.1951. (iv) (a) 2 to 3 ploughings, laddering and levelling. (b) Transplanted. (c) Nil. (v) Nil. (vi) CO. 13 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) N.A. (a) 27.4.1951.

2. TREATMENTS:
   Main-plot treatments: 3 levels of P2O5 as Super: P0=0, P1=30 lb/ac.—surface application and P2=30 lb/ac.—deep layering.
   Sub-plot treatments: 7 levels of N as A/S: N0=0, N1=10 lb/ac.—surface application, N2=20 lb/ac.—surface application, N3=40 lb/ac.—deep layering, N4=10 lb/ac.—deep layering, N5=20 lb/ac.—deep layering and N6=40 lb/ac.—deep layering.

Super and A/S applied on 22.2.1951.
3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block and 7 sub-plots/main-plot. (b) 40'x20'. (iii) 6. (iv) (a) 40"x20'. (b) 4'x10'. (v) 3' around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Stem borer attack observed on 5.3.1951. (iii) Height measurement, no. of tillers, straw and grain yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1582 lb./ac.
(ii) (a) 487.3 lb./ac.
(b) 139.3 lb./ac.
(iii) No effect and interaction N x P is highly significant. N vs no N and deep vs surface application is highly significant. P effect is not significant.
(iv) Mean yield of grain in lb./ac.

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Mean: 1553

S.E. of difference of two
1. P marginal mean = 106.4 lb./ac.
2. N marginal mean = 46.4 lb./ac.
3. N means at the same level of P = 80.4 lb./ac.
4. P means at the same level of N = 129.9 lb./ac.

Crop: Paddy (Kharij). Ref: C.R.R.I. 51(16). Type: 'M'.

Object:—To study the effect of deep layering and surface application of P along with N on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer Item 1) on page 1. (iii) 28.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (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) 65.32'. (x) 24.11.1951.

2. TREATMENTS:
Main-plot treatments:
3 levels of N as A/S: N0 = 0, N1 = 70 lb./ac.—surface application and N2 = 20 lb./ac.—deep layered.

Sub-plot treatments:
4 levels of P2O5 as Super: P0 = 0, P1 = 40, P2 = 80 and P3 = 120 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block and 4 sub-plots/main-plot. (b) 40.5'x15'. (iii) 6. (iv) (a) N.A. (b) 15'x9'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Height measurement, no. of tillers, straw and grain yield. (iv) (a) No. (b) —. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2564 lb./ac.
(ii) (a) 340.8 lb./ac.
(b) 274.9 lb./ac.
(iii) None of the effects is significant.
Crop: Paddy (Kharif).
Object: To study the effect of deep placement of N in combination with P on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 23.6.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Broadcast. (c) 60 lb./ac. (d) and (e) —. (v) Nil. (vi) PTB 10 (late). (vii) Irrigated. (viii) 2–3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02’. (x) 11.0.1953.

2. TREATMENTS:
   Main-plot treatments:
   3 levels of N as A/S: \( N_0 = 0, N_1 = 20 \) and \( N_2 = 40 \) lb./ac.
   Sub-plot treatments:
   3 levels of \( P_2O_5 \): \( P_0 = 0, P_1 = 50 \) and \( P_2 = 100 \) lb./ac.
   A/S applied on 29.7.1953 and \( P_2O_5 \) on 27.6.1953.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/repetition; 3 sub-plots/main-plot. (b) 99’X63’. (iii) 4. (iv) (a) 31’X20’. (b) 28’X17’. (v) 1’ border all round the sub-plots. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) and (b) No. (c) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2355 lb./ac.
   (ii) (a) 121.3 lb./ac.
   (iii) 91.3 lb./ac.
   (iv) Only N effect is significant.
   (v) Av. yield of grain in lb./ac.

<table>
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<tr>
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<th>( N_1 )</th>
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Object: To study the effect of different minor elements on yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A.  (ii) (a) Clay loam. (b) Refer item 11 on page 1.  (iii) 27.6.1951.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Sown in puddled land.  (c) —.  (d) 9°x9°.  (e) 1 to 2.  (v) N.A.  (vi) CO. 13.  (medium).  (vii) Irrigated.  (viii) 2 weeding.  (x) N.A.  (x) 23.10.1951.

2. TREATMENTS:
   Main-plot treatments:
   - 2 doses of N: \( N_0 = 0 \) and \( N_1 = 20 \) lb./ac.
   Sub-plot treatments:
   - 5 minor elements: \( M_0 = 0 \); \( M_1 = \text{Borax at } 20 \text{ lb./ac.} \); \( M_2 = \text{Borax at } 40 \text{ lb./ac.} \); \( M_3 = \text{CuSO}_4 \) at 10 lb./ac. and \( M_4 = \text{CuSO}_4 \) at 20 lb./ac.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 2 main-plots/block; 5 sub-plots/main-plot.  (b) 47'x41'.  (iii) 6.  (iv) (a) 8'3"x20'.  (b) 9'x17'.  (v) 2 lines north and 1 line south and lengthwise 3' on both sides east and west.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  (ii) N.A.  (iii) Germination count and earhead count.  (iv) (a) 1951—continuing.  (b) No.  (c) Yes.  (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 811 lb./ac.
   (ii) (a) 305.6 lb./ac.
   (b) 238.4 lb./ac.
   (iii) Only N effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
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S.E. of difference of two
1. \( N \) marginal means \( = 76.8 \) lb./ac.
2. \( M \) marginal means \( = 97.3 \) lb./ac.
3. \( M \) means at the same level of \( N \) \( = 137.6 \) lb./ac.
4. \( N \) means at the same level of \( M \) \( = 146.2 \) lb./ac.


Object: To study the effect of different minor elements on the yield of upland Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy. (b) Paddy. (c) N.A.  (ii) (a) Clay loamy. (b) Refer item 11 on page 1.  (iii) N.A.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanting.  (c) —.  (d) N.A.  (e) 1 to 2.  (v) 20 lb./ac. of N as \( \text{A/S on } 21,22,8,1952 \).  (vi) CO. 13 (early).  (vii) Irrigated.  (viii) 2 hand weeding.  (x) N.A.  (x) 23.10.1952.
2. TREATMENTS:
1. Control (no manner).
2. CuSO₄ at 20 lb./ac. dissolved in water 100 gls./ac.
3. MnSO₄ at 20 lb./ac. dissolved in water 100 gls./ac.
4. ZnSO₄ at 20 lb./ac. dissolved in water 100 gls./ac.
5. Borax at 20 lb./ac. dissolved in water 100 gls./ac.
6. MgSO₄ at 50 lb./ac. dissolved in water 100 gls./ac.
7. Ammonium Molybdate 10 lb./ac. dissolved in water 100 gls./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) 61'x30': (iii) 6. (iv) (a) 33'x7': (b) 28'x5'. (v) One row around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Straw and grain yield. (iv) (a) 1952-53. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1083 lb./ac.
(ii) 121.8 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
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<td>1207</td>
<td>6.</td>
<td>992</td>
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<td>3.</td>
<td>1042</td>
<td>7.</td>
<td>1067</td>
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<td>4.</td>
<td>1157</td>
<td>S.E.(mean)</td>
<td>-49.7 lb./ac.</td>
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Crop :- Paddy (Kharif). Ref :- C.R.R.I. 49(17). Type :- 'M'.

Object :- To study the effect of Boron application on yield and growth of Paddy.

1. BASAL CONDITIONS:
(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay Loamy. (b) Refer item 11 on page 1. (iii) M.A./12.8 1949.
(iv) (a) 4 ploughings, ladderising and leveling. (b) Transplanted. (c) 6'. (d) 9'x6'. (e) 1 to 2. (f) 20 lb./ac. of N applied at the time of transplanting. (vi) T-1262 (late). (vii) Irrigated. (viii) 2 hand weedings. (a) N.A. (x) 20.12.1949.

2. TREATMENTS:
Main-plot treatments :
- 2 levels of N : N₀=0 and N₁=20 lb./ac.
Sub-plot treatments :
- 6 doses of Boron : B₂=0, B₃=5, B₄=11, B₅=22, B₆=44 and B₇=88 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block, 6 sub-plots/main-plot. (b) 60'x29'. (iii) 5. (iv) (a) 14'x9'. (b) 13' 5'x8 3'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Straw yield and ear-head count. (iv) (a) 1949—Continuing. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2562 lb./ac.
(ii) (a) 255.7 lb./ac.
   (b) 235.2 lb./ac.
(iii) Only N effect is significant.
Crop: Paddy (Kharif).  
Ref: C.R.R.I. 50(19).  
Type: 'M'.

Object: To study the effect of application of phosphate on green manuring crops and subsequent effect on yield and growth of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loamy soil. (b) Refer item 11 on page 1. (iii) 31.7.1950.  
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) -. (d) N.A. (e) 1 to 2. (v) N.A.  

2. TREATMENTS:
   6 doses of Borax: B0 = 0, B1 = 5.5, B2 = 11, B3 = 22, B4 = 44 and B5 = 88 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) 6 x 129'. (iii) 8. (iv) (a) 30' x 9'. (b) 28' x 7'. (v) 1' around. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Earhead count, grain and straw yield. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2544 lb./ac.  
   (ii) 131.57 lb./ac.  
   (iii) Treatment differences are not significant.  
   (iv) Av. yield of grain in lb./ac.  

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<th>Treatment</th>
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<tr>
<td>B4</td>
<td>2575</td>
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<tr>
<td>B5</td>
<td>2564</td>
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</table>

   S.E./mean = 46.7 lb./ac.
2. TREATMENTS:
Main-plot treatments:
- 3 green manures: G0=No green manure, G1=Dhalichua and G2=Pilipeera.
Sub-plot treatments:
- 2 levels of N: N0=0 and N1=20 lb/ac.
- Sub-sub-plot treatments:
  - 2 levels of P0: P0=0 and P1=50 lb/ac.

3. DESIGN:
(i) Split-split-plot. (ii) 3 main-plots/replication, 2 sub-plots/main-plot; 2 sub-sub-plots/sub-plot. (b) 120' x 66'. (iii) 1 row around. (iv) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain and straw yield, height and number of tillers observations. (iv) (a) N0, (b) and (c) --, (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2555 lb/ac.
(ii) (a) 133.6 lb/ac.
(b) 157.7 lb/ac.
(c) 132.4 lb/ac.
(iii) Interaction N x G alone is significant.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>G0</th>
<th>G1</th>
<th>G2</th>
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</table>

S.E. of difference of two
1. G marginal means = 47.23 lb/ac.
2. N marginal means = 45.52 lb/ac.
3. P marginal means = 38.21 lb/ac.
4. N means at the same level of G = 78.00 lb/ac.
5. G means at the same level of N = 73.07 lb/ac.
6. P means at the same level of G = 66.20 lb/ac.
7. G means at the same level of P = 66.50 lb/ac.
8. P means at the same level of N = 54.05 lb/ac.
9. N means at the same level of P = 59.44 lb/ac.

Crop: Paddy (Kharij). Ref: C.R.R.I. 52(22). Type: 'M'.

Object: To study the effect of different minor elements alone and in combination with N.

1. BASAL CONDITIONS:
(i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A./30.7.1952. (iv) (a) 4 ploughings, leveling and levelling. (b) Transplanted. (c) --. (d) N.A. (e) 1 to 2. (v) N.A. (vi) T-1145 (medium). (vii) Irrigated. (viii) 2 hand weedings. (ix) and (x) N.A.

2. TREATMENTS:
Main-plot treatments:
- 2 levels of N: N0=0 and N1=20 lb/ac.
Sub-plot treatments:
- 7 trace elements: M0=Control, M1=MnSO4 at 20 lb/ac., M2=ZnSO4 at 20 lb/ac., M3=Borax at 20 lb/ac., M4=ZnSO4 at 20 lb/ac., M5=MgSO4 at 30 lb/ac. and M6=Ammonium Molybdate at 10 lb/ac.
3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication and 7 sub-plots/main-plot. (b) 63' x 31'. (iii) 6. (iv) (a) N.A. (b) 63' x 15'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) and (b) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1974 lb./ac.
(ii) (a) 331.8 lb./ac. (b) 183.3 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
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S.E. of difference of two
1. N marginal means = 73.51 lb./ac.
2. M marginal means = 74.84 lb./ac.
3. M means at the same level of N = 105.83 lb./ac.
4. N means at the same level of M = 121.83 lb./ac.


Object : To study the effect of minor elements on the yield and growth of Paddy.

1. BASAL CONDITIONS:
(i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item II on page 1. (iii) 19.6.1952/N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) Transplanting. (d) 2 to 3. (v) Nil. (vi) CO. 13 early. (vii) Irrigated. (viii) 2 hand weedings. (ix) N.A. (a) 21.10.1952.

2. TREATMENTS:
Main-plot treatments:
2 levels of N : N0 = 0 and N1 = 20 lb./ac.
Sub-plot treatments:
7 minor elements: M0 = Control, M1 = 20 lb./ac. of Boron, M2 = 40 lb./ac. of Boron, M3 = 60 lb./ac. of Boron, M4 = 10 lb./ac. of Copper, M5 = 20 lb./ac. of Copper and M6 = 30 lb./ac. of Copper.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication, 7 sub-plots/main-plot. (b) 63' x 47'. (iii) 4. (iv) (a) 7'6" x 23'. (b) 6' x 21'. (v) 1 row around. (vi) No.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Earhead count and grain/panicle count and straw yield. (iv) (a) 1930--N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 841 lb./ac.
(ii) (a) 311.0 lb./ac. (b) 176.0 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

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<th>M₂</th>
<th>M₃</th>
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S.E. of difference of two
1. N marginal means = 83.11 lb./ac.
2. M marginal means = 88.00 lb./ac.
3. M means at the same level of N = 124.45 lb./ac.
4. N means at the same level of M = 149.65 lb./ac.

Crop: Paddy (Second Crop). Ref: C.R.R.I. 51(23). Type: 'M'.

Object: To study the effect of different trace elements.

1. BASAL CONDITIONS:
   (i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 27.11.1951/1.1.1952.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 1 to 2. (v) N.A.
   (vi) Ch-47 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding were given to the whole experiment. (ix) N.A. (x) 24-4.1952.

2. TREATMENTS:
   Main-plot treatments: 3 applications of N : N₀=0 N, N₁=20 lb./ac. of N as surface application and N₂=20 lb./ac. of N as deep application.
   Sub-plot treatments: 2 minor elements: M₁=copper and M₂=boron.
   Sub-sub-plot treatments: 4 levels of copper and boron: For copper C₁=0, C₂=10, C₃=20, and C₄=30 lb./ac. while for boron: B₀=0, B₁=20, B₂=40 and B₃=60 lb./ac.

3. DESIGN:
   (i) Split-split-plot. (ii) (a) 3 main-plots/block; 2 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) 63.75'x41.50'. (iii) 6. (iv) (a) 20'x41'. (b) and 18'x3'. (v) 1 border row allround. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Ear-head count per unit of area, grain and straw yield. (iv) (a) 1951—continuing. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1365 lb./ac.
   (ii) N.A.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

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<td>1483</td>
<td>1448</td>
</tr>
<tr>
<td>C₂</td>
<td>1279</td>
<td>1238</td>
<td>1310</td>
<td>1276</td>
<td>B₂</td>
<td>1183</td>
<td>1518</td>
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<tr>
<td>C₃</td>
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<td>1301</td>
<td>1425</td>
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<td>B₃</td>
<td>1267</td>
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<tr>
<td>Mean</td>
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<td>1228</td>
<td>1492</td>
<td>1334</td>
<td>Mean</td>
<td>1313</td>
<td>1455</td>
<td>1420</td>
<td>1396</td>
</tr>
</tbody>
</table>

S.E.'s N.A.
Crop: Paddy (Kharif).

Object: To compare the effect of deep and dry application of A/S with wet and surface application in low lands.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16.6.1951/17.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 5. (v) Nil. (vi) T-1224 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32'. (x) 18.19.12.1951.

2. TREATMENTS:
   \( M_0 \) = control. \( M_1 \) = dry application of 20 lb./ac. of N. \( M_2 \) = dry application of 40 lb./ac. of N. \( M_3 \) = wet application of 20 lb./ac. of N. \( M_4 \) = wet application of 20 lb./ac. of N. one month after transplanting. \( M_5 \) = application of 40 lb./ac. of N one month after transplanting, \( M_6 \) = dry + one month after transplanting application of 20 lb./ac. of N. \( M_7 \) = dry + one month after transplanting application of 40 lb./ac. of N. \( M_8 \) = wet + one month after transplanting application of 20 lb./ac. of N. \( M_9 \) = wet + one month after transplanting application of 40 lb./ac. of N. \( M_0 \) = wet + one month after transplanting application of 40 lb./ac. of N. \( M_11 \) = one month after transplanting + flowering application of 40 lb./ac. of N. \( M_12 \) = dry + one month after transplanting + flowering application of 40 lb./ac. of N and \( M_13 \) = wet + one month after transplanting + flowering application of 40 lb./ac. of N.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 22.5' x 18.5'. (b) 23.5' x 16.5'. (v) 1 all round. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. Lodging on 27.11.1951. (ii) N.A. (iii) Height and ear length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

RESULTS:
   (i) 2909 lb./ac. (ii) 158 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>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>( M_0 )</td>
<td>2055</td>
<td>( M_1 )</td>
<td>2755</td>
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<tr>
<td>( M_2 )</td>
<td>3009</td>
<td>( M_3 )</td>
<td>2312</td>
</tr>
<tr>
<td>( M_4 )</td>
<td>3054</td>
<td>( M_5 )</td>
<td>2892</td>
</tr>
<tr>
<td>( M_6 )</td>
<td>2776</td>
<td>( M_7 )</td>
<td>2990</td>
</tr>
<tr>
<td>( M_8 )</td>
<td>2995</td>
<td>( M_9 )</td>
<td>3100</td>
</tr>
<tr>
<td>( M_10 )</td>
<td>2881</td>
<td>( M_{11} )</td>
<td>2899</td>
</tr>
<tr>
<td>( M_{12} )</td>
<td>2746</td>
<td>( M_{13} )</td>
<td>3014</td>
</tr>
</tbody>
</table>

S.E.[mean]=79.0 lb./ac.

Crop: Paddy (Kharif).

Object: To compare the effect of deep and dry application of A/S with wet and surface application in medium lands.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 13.6.1951/21.7.51. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) Bundharg (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32'. (x) 16.19.12.1951.

2. TREATMENTS:
   Please refer to C.R.R.I. 51(8) on page 32.

3. DESIGN:
   (i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 30.5' x 11.5'. (b) 28.5' x 9.5'. (v) 1 all round. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. Lodging on 17.10.1951. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 1883 lb./ac.
(ii) 216.4 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.: 
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>M_1</td>
<td>1634</td>
</tr>
<tr>
<td>M_2</td>
<td>2029</td>
</tr>
<tr>
<td>M_3</td>
<td>1679</td>
</tr>
<tr>
<td>M_4</td>
<td>1703</td>
</tr>
<tr>
<td>M_5</td>
<td>1898</td>
</tr>
<tr>
<td>M_6</td>
<td>1969</td>
</tr>
</tbody>
</table>

S.E./mean = 108.2 lb./ac.

Crop - Paddy (Kharij).

Ref: C.R.R.I. 52(6). Type - 'M'.

Object - To compare the efficiencies of dry, deep and wet application of A/S in low lands.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item II on page 1. (iii) 16.6.1952/15.7.1952.
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) - . (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-12~2 (late). (vii) Irrigated. (viii) Weeding on 14.8.1952.
(ix) 56.33•, (x) 23.12.1952.

2. TREATMENTS:
1. Surface application of 20 lb./ac. of N at planting.
2. Surface application of 40 lb./ac. of N at planting.
3. Surface application of 20 lb./ac. of N one month after planting.
4. Surface application of 40 lb./ac. of N one month after planting.
5. Sub-surface dry application of 20 lb./ac. of N.
6. Sub-surface dry application of 40 lb./ac. of N.
7. Sub-surface pellet application at planting of 20 lb./ac. of N.
8. Sub-surface pellet application at planting of 40 lb./ac. of N.
9. Sub-surface pellet application one month after planting of 20 lb./ac. of N.
10. Sub-surface pellet application one month after planting of 40 lb./ac. of N.
11. Sub-surface dry application of 10 lb./ac. of N + surface application one month after planting of 10 lb./ac. of N.
12. Sub-surface dry application of 20 lb./ac. of N + surface application one month after planting of 20 lb./ac. of N.
13. Sub-surface dry application of 10 lb./ac. of N + sub-surface pellet application one month after planting of 10 lb./ac. of N.
14. Sub-surface dry application of 20 lb./ac. of N + sub-surface pellet application one month after planting of 20 lb./ac. of N.
15. Surface application of 10 lb./ac. of N + surface application one month after planting of 10 lb./ac. of N.
16. Surface application of 20 lb./ac. of N + surface application one month after planting of 20 lb./ac. of N.
17. Surface application of 10 lb./ac. of N + sub-surface pellet application one month after planting of 10 lb./ac. of N.
18. Surface application of 20 lb./ac. of N + sub-surface pellet application one month after planting of 20 lb./ac. of N.
19. Surface application of 20 lb./ac. of N + surface application one month after planting of 10 lb./ac. of N +10 lb./ac. of N one month before flowering.
20. Sub-surface dry application of 20 lb./ac. of N + surface application one month after planting of 10 lb./ac. of N +10 lb./ac. of N at flowering.
21. Surface application of 20 lb./ac. of N + pellet application one month after planting of 10 lb./ac. of N + pellet application at flowering of 10 lb./ac. of N.
22. Control—no manure.

Dry application was on 1.7.1952, wet application was on 23.7.1952 and application at flowering on 10 12.1952.

3. DESIGN:
(i) R.B.D. (ii) (a) 22. (b) N.A. (iii) 4. (iv) (a) 22.5' x 11'. (b) 20.5' x 9'. (v) 1' around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. Lodging on 29.10.1952 in heavily manured plots. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 2281 lb./ac.
(ii) 206.1 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>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2073</td>
<td>9.</td>
<td>2273</td>
<td>17.</td>
<td>2325</td>
</tr>
<tr>
<td>2.</td>
<td>2259</td>
<td>10.</td>
<td>2325</td>
<td>18.</td>
<td>2316</td>
</tr>
<tr>
<td>3.</td>
<td>2395</td>
<td>11.</td>
<td>2148</td>
<td>19.</td>
<td>2310</td>
</tr>
<tr>
<td>4.</td>
<td>2226</td>
<td>12.</td>
<td>2355</td>
<td>20.</td>
<td>2507</td>
</tr>
<tr>
<td>5.</td>
<td>2266</td>
<td>13.</td>
<td>2289</td>
<td>21.</td>
<td>2337</td>
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<td>2392</td>
<td>14.</td>
<td>2242</td>
<td>22.</td>
<td>1895</td>
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<td>7.</td>
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<td>2198</td>
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<td>2393</td>
<td>16.</td>
<td>2393</td>
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</tr>
</tbody>
</table>

S.E./mean = 106.2 lb./ac.

Crop: Paddy (Kharif). Ref: C.R.R.I. 52(7). Type: 'M'.

Object: To compare the efficiencies of dry, deep and wet application of A/S in medium lands.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1.
(iii) 17.6.1952/18.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) (d) N.A.
(ix) 56.03°. (a) 23.10.1952.

2. TREATMENTS:

Please refer to C.R.R.I. 52(6) on page 33.


3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 30.5'x6.75'. (b) 28.5'x4.75'. (v) 1' around. (vi) Yes.

4. GENERAL:

(i) Satisfactory. Lodging on 15.10.1952. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1245 lb./ac.
(ii) 173.7 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>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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<td>1039</td>
<td>17.</td>
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<tr>
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<td>10.</td>
<td>1171</td>
<td>18.</td>
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<tr>
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<td>1267</td>
<td>11.</td>
<td>1309</td>
<td>19.</td>
<td>1348</td>
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<td>12.</td>
<td>1277</td>
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<td>21.</td>
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<tr>
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<td>1229</td>
<td>22.</td>
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<td>7.</td>
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<td>1161</td>
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<tr>
<td>8.</td>
<td>1477</td>
<td>16.</td>
<td>1387</td>
<td></td>
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</tr>
</tbody>
</table>

S.E./mean = 86.85 lb./ac.

Crop: Paddy (Kharif). Ref: C.R.R.I. 53(5). Type: 'M'.

Object: To compare the efficiencies of sub-surface, surface and dry application of A/S at different levels and their combinations.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1.
(iii) 20.6.1953/14.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) (d) N.A.
(e) 2 to 3. (v) Nil. (vi) T-1242 (late). (vii) Irrigated. (viii) 2 weedings. (ix) 46.02°. (a) 18.12.1953.
2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tbody>
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<td>M₀</td>
<td>3176</td>
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<td>3019</td>
<td>M₁₂</td>
<td>3095</td>
</tr>
<tr>
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<td>M₁₃</td>
<td>3407</td>
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<td>3434</td>
</tr>
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<td>M₁₄</td>
<td>3001</td>
<td>M₂₀</td>
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<tr>
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<td>M₁₃</td>
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<td>2978</td>
<td>M₁₃</td>
<td>3274</td>
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</tr>
</tbody>
</table>

S.E./mean 115.9 lb./ac.

Crop : Paddy (Kharif).

Ref : C.R.R.I. S3(2). Type : 'M'.

Object : To compare the effects of nitrogenous fertilizers at different N levels on the yield of Paddy.

1. BASAL CONDITIONS:

| (i) | (a) Nil. | (b) Paddy. | (c) As per treatments. | (ii) | (a) Clay loam. | (b) Refer item 11 on page 1. | (iii) | 26.6.1953/29.7.1953. | (iv) | (a) 4 ploughings, ladder and levelling. | (b) Transplanted. | (c) —. | (d) N.A. | (e) 2 to 3. | (f) Nil. | (f) T 1145 (medium). | (g) Irrigated. | (h) 2 to 3 intercultures with Japanese weeder and one hand weeding. | (i) 46.02°. | (x) 16,17,11.1953. |

2. TREATMENTS:

All combinations of (1) and (2) + a control (no N).

(1) 2 levels of N : N₁ = 20 lb./ac. and N₂ = 40 lb./ac.


3. DESIGN:

(i) R.B.D. (ii) (a) 17. | (b) N.A. | (iii) 4. | (iv) (a) 30' x 9'. | (b) 28' x 7'. | (v) 1 row around. | (vi) Yes. |
4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield.
(iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2701 lb./ac.
(ii) 252.6 lb./ac.
(iii) S effect alone 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>S₆</th>
<th>S₇</th>
<th>S₈</th>
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<td>2695</td>
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</table>

S.E. of N marginal mean = 44.7 lb./ac.
S.E. of S marginal mean = 89.3 lb./ac.
S.E. of body of table = 126.3 lb./ac.

Crop: Paddy (Kharif). Ref: C.R.R.I. 53(9). Type: 'M'.

Object: To study the efficiency of *dhanicha* and *sannhemp* grown in situ and brought from outside applied alone and in combination with inorganic fertilizers like lime, Super phosphate and A/S.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) Clay loam. (b) Refer item 11 on page 1. (iii) 20.6.1953/25, 26.7.1953.
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 10'x6'. (e) 2-3 seedlings per hole. (v) Nil. (vi) T-141 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02'. (x) 3 to 5.I2.1953.

2. TREATMENTS:
All combinations of (1), (2), (3), (4), (5) and (6).
(1) 2 types of manure: (A₀) *sannhemp* and (A₁) *dhanicha*.
(2) 2 methods of application: (B₀) brought from out side and (B₁) in situ.
(3) 2 levels of lime: (C₀) no lime and (C₁) 1 ton/ac. of lime.
(4) 2 levels of P₂O₅: (D₀) no P₂O₅ and (D₁) 50 lb./ac. of P₂O₅.
(5) 2 levels of N: (E₀) 0 and (E₁) 50 lb./ac. of N.
(6) 2 levels of P₂O₅ to Paddy: (F₀) No P₂O₅/acc. and (F₁) 50 lb./ac. of P₂O₅ F.

3. DESIGN:
(i) 2ª confounded design with ABC, CDE, ADF, BEF, ABDE, BCDF, ACEF interactions confounded.
(ii) (a) 8 plots/block: 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 32'X14'. (b) 30'4"X12'. (v) 1 row length-wise and 2 rows breadth-wise. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Straw and grain, height, tiller and ear-length. (iv) (a) N.A. (b) N.A.
(c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 3703 lb./ac.
(ii) 306.4 lb./ac.
(iii) Only B effect is highly significant.
(iv) Av. yield of grain in lb./ac.
Crop: Paddy (Kharif).

Ref.: C.R.R.I. 49(14). Type: 'M'.

Object: To study the effect of different phosphatic manures in presence or absence of N and lime along with different methods of application on Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Loam. (b) Refer item II on page 1. (iii) 16.5.1949/20.6.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) - (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-90 (late) (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00”. (x) 10, 12 and 13.12.1949.

2. TREATMENTS:
   Main-plot treatments: 4 manures: M₀=control, M₁=20 lb./ac. of N as A/S, M₂=lime and M₃=20 lb./ac. of N+lime.
   Sub-plot treatments: 5 applications of P₅O₅ at 30 lb./ac.: P₀=0, P₁=surface application of Super, P₂=surface application of Agrophos, P₃=placement of Super and P₄=placement of Agrophos.
   A/S applied on 1.9.1949 and lime and P₅O₅ from 22 to 24.8.1949.

3. DESIGN:
   (i) Split-plot. (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) 137’×124’. (ii) 6. (iv) (a) N.A. (b) 21.5’×7.5’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Height measurement, no. of tillers, straw and grain yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2738 lb./ac.
   (ii) 321.3 lb./ac.
   (iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
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Mean   2751 2714 2709 2731 2783 2738

S.E. of difference of two
1. N marginal means
2. P marginal means
3. P means at the same level of N
4. N means at the same level of P

---

Crop : Paddy (Kharij).
Ref : C.R.R.I. 52(15).
Type : ‘M’.

Object : To study the effect of lime on N and P availability to Paddy plant, in water-logged low-lands.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) N.A. (b) pH. is about 5.6. (iii) 18.6.1952/23.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) - . (d) N.A. (e) 2 to 3. (f) Nil. (g) - . (h) Irrigated. (i) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ii) 56.03'.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of lime:
   L₀ = 0 and L₁ = 2000 lb./ac. of CaO.
   Sub-plot treatments:
   3 levels of P₂₀:
   P₀ = 0, P₁ = 50 and P₂ = 100 lb./ac.
   Sub-sub-plot treatments:
   3 applications of N:
   N₀ = 0, N₁ = 20 lb./ac. applied at surface and N₂ = 50 lb./ac. applied deep.
   Lime applied on 23.7.1952 and N₁ 15 to 20 days afterwards. P₂₀ applied on 20/21.6.1952.

3. DESIGN:
   (i) Split-split-plot. (ii) 2 main-plots/replication, 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) 69.5' X 47.25'. (iii) 3. (iv) (a) 22' X 15.75'. (b) 20' X 13'. (c) 1 row all round. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1952—continued. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2873 lb./ac.
   (ii) (a) 16.8 lb./ac.
   (b) 167.3 lb./ac.
   (c) 137.6 lb./ac.
   (iii) Main effects of L and N alone are highly significant.
   (iv) Av. yield of grain in lb./ac.

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Crop: Paddy (*Kharij*).  
Ref: C.R.R.I. 53 (23).  
Type: 'M'.

Object: To study the effect of deep placement of A/S in combination with P$_2$O$_5$ on the yield of Paddy in low lands.

1. **BASAL CONDITIONS:**
   - (i) (a) Nil. (b) Paddy. (c) N.A.  
   - (ii) (a) Clay loam. (b) Refer item 11 on page 1.  
   - (iii) 25.6.1953/24.7.1953.  
   - (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted.  
   - (c) 19.10' x 10'. (d) 2 to 3. (v) Nil.  
   - (vi) T-1242 (late). (vii) Irrigated.  
   - (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02. (x) 15.12.1953.

2. **TREATMENTS:**
   - **Main-plot treatments**
     - 2 levels of lime: L$_0$ = 0 and L$_1$ = 30 lb./ac.
   - **Sub-plot treatments**
     - 3 levels of P$_2$O$_5$: 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.

Line applied last year and Residual effect is studied this.

3. **DESIGN:**
   - (i) Split-split plot.  
   - (ii) (a) 2 main-plots/block; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot.  
   - (b) 140.75' x 47.25'. (iii) 4.  
   - (iv) (a) N.A. (b) 13.33' x 20.83'. (v) N.A. (vi) Yes.

4. **GENERAL:**
   - (i) Satisfactory.  
   - (ii) N.A.  
   - (iii) Height measurements, no. of tillers, straw and grain yield.  
   - (iv) (a) 1952—contd. (b) Yes (c) Nil. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**
   - (i) 30.15 lb./ac.  
   - (ii) (a) 57.0 lb./ac. (b) N.A.  
   - (v) 225.3 lb./ac.  

   (iii) L and N effects are highly significant while other effects are not significant.
   - (iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
   - 1. L marginal means = 13.4 lb./ac.
   - 2. N marginal means = 65.0 lb./ac.
   - 3. N means at the same level of L = 92.0 lb./ac.
   - 4. L means at the same level of N = 76.3 lb./ac.

Other S.E.'s N.A.

1. Object: To study the effect of phosphate manuring on Paddy in the presence or absence of nitrogen.

2. TREATMENTS:
   Main-plot treatments: 2 methods of application: M1 = surface application and M2 = deep application.
   Sub-plot treatments: 3 levels of N: N0 = 0, N1 = 20, and N2 = 40 lb./ac. (lb/acre).
   Sub-sub-plot treatments: 4 levels of P2O5: P0 = 0, P1 = 40, P2 = 80, and P3 = 120 lb./ac.
   Application of P2O5 alone deep on 19.1.1952 and application of N and P2O5 combined (surface) on 20.1.1952.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot; and 4 sub-sub-plots/sub-plot.
   (b) 63’ × 20’. Sub block: 20’ × 20’.
   (c) 4’ × 6’. (d) Nil. (e) 2-3 tillings/tiling.

4. GENERAL:
   (i) Deep application has given better crop than surface application. (ii) N.A. (iii) Grain and straw yield, height and tiller counts. (iv) (a) No, (b) No, (c) Nil. (v) (a) Nil, (b) Nil, (vi) and (vii) Nil.

5. RESULTS:
   (i) 1398 lb./ac.
   (ii) (a) 456.4 lb./ac.
   (b) 259.0 lb./ac.
   (c) 290.6 lb./ac.
   Application of N alone deep on 19.1.1952 and application of P2O5 combined (surface) on 20.1.1952.

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   S.E. of difference of two
   1. M marginal means = 77 lb./ac.
   2. N marginal means = 72 lb./ac.
   3. P marginal means = 72 lb./ac.
   4. N means at the same level of M = 74.8 lb./ac.
   5. M means at the same level of N = 97.5 lb./ac.


Object: To study the effect of P2O5, G.M. and A/S on the yield and growth of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy, (c) N.A. (iii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 28.6.1948/5.8.1948.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) Nil. (d) Nil. (e) 2-3 seedlings/tiling. (f) Nil. (vi) AKP-10. (vii) Irrigated. (viii) N.A. (ix) 54.3M². (x) N.A.
2. TREATMENTS:

Main-plot treatments:

3 applications of manure: M0 = control, M1 = G.M. at 4000 lb/ac. and M2 = A/S.

Sub-plot treatments:

8 sources to give 30 lb/ac of P2O5: S0 = Control, S1 = Super 18%, S2 = Agrophos 25%, S3 = Selecto-phos 24.5%, S4 = Hyper phosphate 25-26%, S5 = Hyper-phosphate 26-27%, S6 = Hyper-phosphate 28-29% and S7 = B.M. 23%.

G.M. applied on 4, 5, 8, 1948, A/S on 7, 9, 1948 and P2O5 on 4, 5, 8, 1948.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block; 8 sub-plots/main-plot. (b) 138'x127'. (iii) 4. (iv) (a) 44'x15'. (b) 42'x13'. (v) 1 border all round. (vi) Yes.

4. GENERAL:

(i) Good. (ii) H. bisna attacked in centre. Tops of the crop cut in two fields on 4, 5, 9, 1948. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1948—control. (b) —. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 9 lb/ac.
(ii) (a) 181.6 lb/ac. (b) 138.2 lb/ac.
(iii) M and S effects are highly significant while interaction is not significant.
(iv) Av. yield of grain in lb/ac.

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S.E. of difference of two

1. M marginal means = 45.4 lb/ac.
2. S marginal means = 56.4 lb/ac.
3. S means at the same level of M = 97.7 lb/ac.
4. M means at the same level of S =102.1 lb/ac.

Crop: Paddy (Kharif).

Ref: C.R.R.I. 49(15). Type: 'M'.

Object: To determine the residual effect of phosphatic fertilizers.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings laddering and levelling. (b) Transplanted. (c) —. (d) Bulk planting. (e) 2—3 seedlings/hill. (f) Nil (vii) T-90 (lace). (viii) Irrigated. (ix) 2—3 intercultures with Japanese weeder and one hand weeding. (x) 46.00°. (x i) N.A.

2. TREATMENTS:

Main-plot treatments:

3 applications of manure: M0 = Control, M1 = G.M. at 4000 lb/ac. and M2 = A/S.

Sub-plot treatments:

8 sources to give 30 lb/ac of P2O5: S0 = Control, S1 = Super 18%, S2 = Agrophos 25%, S3 = Selecto-phos 24.5%, S4 = Hyper phosphate 25-26%, S5 = Hyper-phosphate 26-27%, S6 = Hyper-phosphate 28-29% and S7 = B.M. 23%.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block; 8 sub-plots/main-plot. (b) 138'x127'. (iii) 4. (iv) (a) 44'x15'. (b) 42'x13'. (v) 1 border all round. (vi) Yes.
4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b)—. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1998 lb./ac.
(ii) (a) 269.2 lb./ac.
(b) 138.7 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. M marginal means
2. S marginal means
3. S means at the same level of M
4. M means at the same level of S

Crop: Paddy (Kharif). Ref: C.R.R.I. 51(10). Type: "M".

Object: To study the effect of manuring on the incidence of blast.

1. BASAL CONDITIONS:

(i) Nil. (b) Paddy. (c) N.A. (d) Clay loam. (b) Refer item II on page 1. (iii) 10.7.1951/17.8.1951. (iv) (a) 2 ploughings, laddering and levelling. (b) Transplanted. (c)— (d) N.A. (e) 2 to 3. (v) Nil. (vi) T-114.5 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32". (x) 5.12.1951.

2. TREATMENTS:

All combinations of (1) and (2) + a control.
1. 2 levels of N: N₀=20 and N₁=40 lb./ac.
2. 4 sources of N: S₁=Dhanica, S₂=G.N.C., S₃=Compost and S₄=A/S.

3. DESIGN:

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 8. (iv) (a) 19'x19'. (b) 17'x17'. (v) 1' around. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Height and ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1950—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 2448 lb./ac.
(ii) 232.9 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of N marginal mean
S.E. of S marginal mean
S.E. of body of table =64.71 lb./ac.
=63.23 lb./ac.
=89.42 lb./ac.
Crop :- Paddy (Kharij).

Object :- To find out the response of Paddy to N, P_2O_5 and K_2O with and without basal dressing.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 3. (iii) 27.6.1949/2.8.1949.
   (iv) (a) 3-4 ploughings, spreading and levelling. (b) Bulk planting. (c) -- (d) 6'-8'. (v) 2-3.
   (v) As per treatments
   (vi) T-1145 (medium). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00'. (x) 20.11.1949.

2. TREATMENTS:
   Main-plot treatments : 4 organic manures as basal dressing: M_0=No manure, M_1=Compost, M_2=Dhaincha as G.M. and M_3=G.N.C.
   Sub-plot treatments:
   - All combinations of (1), (2) and (3)
   - (1) 3 levels of N: N_0=0, N_1=20 and N_2=40 lb./ac.
   - (2) 3 levels of P_2O_5: P_0=0, P_1=20 and P_2=40 lb./ac.
   - (3) 3 levels of K_2O: K_0=0, K_1=20 and K_2=40 lb./ac.
   27 NPK treatments divided into 3 sub-blocks confounding 2 d.f. of NPK interaction between sub-blocks of 9 treatment combinations and each main-plot consisting of these sub-blocks.

3. DESIGN:
   (i) 4 x 3^3 split-plot confounding. (ii) 4 main-plots/replication, 3 sub-blocks/main-plot each sub-block consisting of 9 different combinations of NPK treatments confounding 2 d.f. of NPK interaction between sub-blocks: 9 sub-plots/sub-blocks. (iii) 2. (iv) (a) 12'x31'. (b) 10'x29'. (v) 1 around. (vi) Yes.

4. GENERAL:
   (i) Good. Lodging on 20.11.1949. (ii) Silver shoot blast appeared on 12.9.1949. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) --. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2227 lb./ac.
   (ii) (a) 471.3 lb./ac.
   (b) 306.7 lb./ac.
   (iii) Interaction N X M highly significant. Interaction N X P X K is significant. Others are not significant.
   (iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. M marginal means = 90.7 lb./ac.
2. N, P or K marginal means = 51.1 lb./ac.
3. N, P or K means at the same level of M = 102.2 lb./ac.
4. M means at the same level of N, P or K = 123.3 lb./ac.
5. means of the body of N X P, P X K or N X K tables = 177.1 lb./ac.

Object: — To find out the response of Paddy to N, P_2O_5 and K_2O with and without basal dressing.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16, 21, 6, 950/31, 7, 950 to 5, 8, 950. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) —. (d) 6’—8’. (e) 2–3. (v) As per treatments. (vi) T-1145 (medium). (vii) IRRIGATED. (viii) 2–3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47’. (x) N.A.

2. TREATMENTS:
Main-plot treatments: 4 organic manures as basal dressing: Mo=No manure, M_1 = Compost, M_2 = Dhaiicha as G.M. and M_3 = G.N.C.

Sub-plot treatments:
All combinations of (1), (2) and (3)
(1) 3 levels of N: N_0 = 0, N_1 = 20 and N_2 = 40 lb./ac.
(2) 3 levels of P_2O_5: P_0 = 0, P_1 = 20 and P_2 = 40 lb./ac.
(3) 3 levels of K_2O: K_0 = 0, K_1 = 20 and K_2 = 40 lb./ac.

27 NPK treatments divided into 3 sub-blocks confounding 2 d.f. of NPK interaction between sub-blocks of 9 treatment combinations and each main-plot consists of these sub-blocks.

3. DESIGN:
(i) 4 x 3 split-plot confounding. (ii) (a) 4 main-plots/replication, 3 sub-blocks/main-plot, each sub-block consisting of 9 different combinations of NPK treatments confounding 2 d.f. of NPK interaction between sub-blocks; 9 sub-plots/sub-block. (b) N.A. (iii) 2. (iv) (a) 12’x31’. (b) 10’x29’. (v) 1’ all around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. Lodging on 17.10.1950. (ii) N.A. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1949—contd. (b) Y.s. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2222 lb./ac.
(ii) (a) 956.9 lb./ac.
(b) 293.9 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. M marginal means =184.2 lb./ac.
2. N, P or K marginal means = 98.0 lb./ac.
3. N, P or K means at the same level of M = 98.0 lb./ac.
4. M means at the same level of N, P or K =00.3 lb./ac.
5. means of body of N x P, N x K or P x K table = 84.8 lb./ac.
Crop: Paddy (Kharij).  
Ref: C.R.R.I. 51(6). Type: 'M'.

Object: To find out the response of Paddy to N, P<sub>10</sub> and K<sub>20</sub> with and without basal dressing.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Paddy.  (c) As per treatments.  (ii) (a) Clay loam.  (b) Refer item 11 on page 1.  (iii) 13.6.1951/20.7.1951.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Bulk planting.  (c) —.  (d) About 6"—8".  (e) 2 to 3.  (vi) As per treatments.  (vii) T-1145 (medium).  (viii) II—3 inter-cultures with Japanese weeder and one hand weeding.  (ix) 65.32'.  (x) 16, 17.11.1951.

2. TREATMENTS:
   Main-plot treatments:
   4 organic manures as basal dressing: M<sub>0</sub> = No manure, M<sub>1</sub> = Compost, M<sub>2</sub> = Dhaincha as G.M. and M<sub>3</sub> = G.N.C.

Sub-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N<sub>0</sub> = 0, N<sub>1</sub> = 20 and N<sub>2</sub> = 40 lb./ac.
   (2) 3 levels of P<sub>10</sub>: P<sub>0</sub> = 0, P<sub>1</sub> = 20 and P<sub>2</sub> = 40 lb./ac.
   (3) 3 levels of K<sub>20</sub>: K<sub>0</sub> = 0, K<sub>1</sub> = 20 and K<sub>2</sub> = 40 lb./ac.

27 NPK treatments divided into 3 sub-blocks confounding 2 d.f. of NPK interaction between sub-blocks of 9 treatments combinations and each main-plot consists of these sub-blocks.

3. DESIGN:
   (i) 4 x 3<sup>3</sup> split-plot confounding.  (ii) (a) 4 main-plots/replication, 3 sub-blocks/main-plot, each sub-block consisting of 9 different combinations of NPK treatments confounding 2 d.f. of NPK interaction between sub-blocks, 9 sub-plots/sub-block.  (b) N.A.  (iii) 2.  (iv) (a) 12' x 11'.  (b) 10' x 29'.  (v) I' alround.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  Lodging on 12 to 14.11.1951.  (ii) N.A.  (iii) Height measurements, no. of tillers, straw and grain yield.  (iv) (a) 1949—contd.  (b) Yes.  (c) N.A.  (v) (a) and (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 2448 lb./ac.
   (ii) (a) 497.8 lb./ac.
   (b) 234.8 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. M marginal means = 95.9 lb./ac.
2. N, P or K marginal means = 39.1 lb./ac.
3. N, P or K means at the same level of M = 78.2 lb./ac.
4. M means at the same level of N, P or K = 115.2 lb./ac.
5. means of the body of N x P, N x K or P x K table = 67.8 lb./ac.
Crop: Paddy (Kharif).  
Ref.: C.R.R.I. 52(5).  
Type: 'M'.

Object: To find out the response of Paddy to N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O with and without basal dressing.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) I rep. 16.6.1952, II rep. 17.6.1952/II rep. 26.7.1952. II rep. 20.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Bulk planting. (c) As per treatments. (v) T-1145 (medium) (vi) Irrigated. (vii) Worded on 24.8.1952 and 29.8.1952. (ix) 56 03. (x) 10 to 11.1952.

2. TREATMENTS:
   Main-plot treatments: 4 organic manures as basal dressing: M<sub>0</sub>=No manure, M<sub>1</sub>=Compost, M<sub>2</sub>=Dhaincha as G.M. and M<sub>3</sub>=G.N.C.
   Sub-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N : N<sub>0</sub>=0, N<sub>1</sub>=20 and N<sub>2</sub>=40 lb./ac.
   (2) 3 levels of P<sub>2</sub>O<sub>5</sub> : P<sub>0</sub>=0, P<sub>1</sub>=20 and P<sub>2</sub>=40 lb./ac.
   (3) 3 levels of K<sub>2</sub>O : K<sub>0</sub>=0, K<sub>1</sub>=20 and K<sub>2</sub>=40 lb./ac.

27 NPK treatments divided into 3 sub-blocks confounding 2 d.f. of NPK interaction between sub-blocks of 9 treatment combinations and each main-plot consists of these sub-blocks.

3. DESIGN:
   (i) 4 x 3<sup>3</sup> split-plot confounding. (ii) (a) 4 main-plots/replication, 3 sub-blocks/main-plot, each sub-block consisting of 9 different combinations of NPK treatments confounding 2 d.f. of NPK interaction between sub-blocks, 9 sub-plots/sub-block. (b) N.A. (iii) 2. (iv) (a) 12' x 31'. (b) 10' x 29'. (v) 1' a/round. (vi) Yes.

4. GENERAL:
   (i) Satisfactory in plots where N<sub>2</sub> is applied. Lodging on 25.10.1952. (ii) N.A. (iii) S raw, height and tillers. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2084 lb./ac. 
   (ii) (a) 615.5 lb./ac. 
   (b) 322.7 lb./ac.
   (iii) Interaction M x N is highly significant. Other effects are not significant. 
   (iv) Av. yield of grain in lb./ac.

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<td>2120</td>
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<td>Mean</td>
<td>2062</td>
<td>2223</td>
<td>2037</td>
<td>2019</td>
<td>2165</td>
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<td>1829</td>
<td>2054</td>
<td>2132</td>
<td>2191</td>
<td>2149</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means = 118.5 lb./ac.
2. N, P or K marginal means = 53.8 lb./ac.
3. N, P or K means at the same level of M = 107.6 lb./ac.
4. M means at the same level of N, P or K = 147.4 lb./ac.
5. means of the body of N x P, N x K or P x K table = 93.2 lb./ac.
Crop: Paddy (Kharif).
Ref: C.R.R.I. 53(6).
Type: 'M'.

Object: To find out the response of Paddy to N, P₂O₅ and K₂O with and without basal dressing.

1. BASAL CONDITION:
   (i) Nil.
   (ii) Paddy.
   (iii) As per treatments.
   *BASAL CONDITION (i) Nil.
   (ii) Paddy.
   (iii) As per treatments.
   (iv) Clay loam.
   (v) 20, 22.6.1953/27, 23.7.1953 for first and second replications.
   (vi) 4 ploughings, laddering and levelling.
   (vii) As per treatments.
   (viii) Bulk planting.
   (ix) About 6.8'.
   (x) 2 to 3.
   (xi) As per treatments.
   (xii) T-1145.
   (xiii) Irrigated.

2. TREATMENTS:
   **Main-plot treatments**:
   4 organic manures as basal dressing: M₀ = No manure, M₁ = Compost, M₂ = Dhancho as G.M. and M₃ = G.N.C.
   **Sub-plot treatments**:
   All combinations of (1), (2) and (3)
   (i) 3 levels of N: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
   (ii) 3 levels of P₂O₅: P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.
   (iii) 3 levels of K₂O: K₀ = 0, K₁ = 20 and K₂ = 40 lb./ac.
   All NPK treatments divided into 3 sub-blocks confounding 2 d.f. of NPK interaction between sub-blocks of 9 treatment combinations and each main-plot consists of these sub-blocks.

3. DESIGN:
   (i) 4 x 3 x 3 split-plot confounding.

4. GENERAL:
   (i) Good. Yellowing in unmanured plots.
   (ii) N.A.
   (iii) Straw height and tiller.
   (iv) (a) 1949—continued.
   (b) Nil.
   (c) Nil.
   (d) nil.

5. RESULTS:
   \[ \begin{array}{cccccc}
   M₀ & M₁ & M₂ & M₃ & P₀ & P₁ & P₂ & \text{Mean} \\
   \hline
   \text{N₀} & 2091 & 2282 & 2442 & 2121 & 2321 & 2178 & 2233 & 2288 & 2343 & 2071 & 2234 \\
   \text{N₁} & 2108 & 2339 & 2439 & 2109 & 2179 & 2312 & 2215 & 2177 & 2180 & 2249 & 2249 \\
   \text{N₂} & 2270 & 2511 & 2439 & 1820 & 2260 & 2340 & 2261 & 2167 & 2291 & 2323 & 2260 \\
   \text{Mean} & 2133 & 2377 & 2440 & 2017 & 2260 & 2340 & 2249 & 2257 & 2271 & 2214 & 2247 \\
   \text{P₀} & 2184 & 2444 & 2335 & 2065 & 2345 & 2248 & 2178 & 2137 & 2190 & 2249 & 2249 \\
   \text{P₁} & 2215 & 2276 & 2545 & 2050 & 2260 & 2267 & 2287 & 2167 & 2291 & 2323 & 2260 \\
   \text{P₂} & 2070 & 2412 & 2440 & 1935 & 2174 & 2215 & 2254 & 2143 & 2387 & 2400 & 2029 \\
   \hline
   \text{K₀} & 2152 & 2386 & 2491 & 2009 & 2152 & 2386 & 2491 & 2143 & 2387 & 2400 & 2029 \end{array} \]

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
5. means of the body of N × P, N × K or P × K table

Ref. C.R.R.I. 53(6)
Crop :- Paddy (Kharif).
Ref :- C.R.R.I. 48(12). Type :- 'MV'.

Object :- To find out the effect of G.N.C. and A/S on transplanted Paddy.

1. BASAL CONDITIONS :
   (i) (a) Paddy. (b) Paddy. (c) N.A.  (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) \( V_1 \) on 25.6.1948 and \( V_2 \) on 24.6.1948/7.1.1946. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) - (d) N.A. (e) 2 to 3. (v) 100 md./ac. of compost. (vi) As per treatments. (vii) Irrigated. (vii) 2 to 3 interculturings with Japanese weeder and one hand weeding. (ix) 54.35°. (x) \( V_1 \) on 20.10.1948 and \( V_2 \) on 23.11.1948.

2. TREATMENTS :
   Main-plot treatments :
   2 varieties: \( V_1 = T-608 \) (medium) and \( V_2 = T-812 \) (late).
   Sub-plot treatments :
   3 manures: \( M_0 = 0 \), \( M_1 = 40 \) lb./ac. of N as G.N.C. and \( M_2 = 40 \).lb./ac. of N as A/S.

3. DESIGN :
   (i) Split-plot. (ii) (a) 2 main-plots/replication and 3 sub-plots/main-plot. (b) 62'. (iii) 8. (iv) (a) 30'. (b) 28'x18'. (v) 1' allround. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) N.A. (iii) Straw weight, height of plant and number of tillers. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 2184 lb./ac. (ii) (a) 168.6 lt./ac. (b) 102.2 lb./ac. (iii) \( V \) and \( M \) effects are significant. Interaction is not significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
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<td>1867</td>
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<tr>
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<tr>
<td>Mean</td>
<td>1979</td>
<td>2278</td>
<td>2297</td>
</tr>
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</table>

S.E. of difference of two:
1. \( V \) marginal means = 48.7 lb./ac.
2. \( M \) marginal means = 36.1 lb./ac.
3. \( M \) means at the same level of \( V \) = 51.1 lb./ac.
4. \( V \) means at the same level of \( M \) = 64.1 lb./ac.

Crop :- Paddy (Kharif).
Ref :- C.R.R.I. 50(21). Type :- 'MV'.

Object :- To compare the effect of A/S on different Paddy varieties.

1. BASAL CONDITIONS :
   (i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 21.5.1950/8.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) -. (d) 3' - 4' apart. (e) 1 to 2. (v) 100 md./ac. of compost. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 interculturings with Japanese weeder and one hand weeding. (ix) N.A. (x) \( V_1 \) to \( V_4 \) on 29.9.1950, \( V_5 \) and \( V_6 \) on 6.10.1950 and the rest on 9.10.1950.

2. TREATMENTS :
   Main-plot treatments :
   3 levels of N : \( N_0 = 0 \), \( N_1 = 30 \) and \( N_2 = 60 \) lb./ac.
   Sub-plot treatments :
   8 varieties: \( V_1 = CH-2 \), \( V_2 = R-9 \), \( V_3 = Omachi \), \( V_4 = Ashahi \), \( V_5 = Bentihing \), \( V_6 = CH-45 \), \( V_7 = Adt \) 4 and \( V_8 = Adt \) 20.

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/block and 8 sub-plots/main-plot. (b) 64'x64'. (iii) 4. (iv) (a) 20'. (b) 9'x18'. (v) 1' allround. (vi) Yes.
4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Straw yield, height of plants and number of tillers. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1022 lb/ac.
(ii) 900 lb/ac.
(iii) M and V effects are highly significant while their interaction is not 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>774</td>
<td>677</td>
<td>1117</td>
<td>1254</td>
<td>1476</td>
</tr>
</tbody>
</table>

S.E. of difference of two mean:
1. N marginal mean = 72.4 lb/ac.
2. V marginal mean = 120.3 lb/ac.
3. V means at the same level of N = 208.3 lb/ac.
4. N means at the same level of V = 207.9 lb/ac.

Crop: Paddy (Kharij). Ref.: C.R.R.I. 50(12). Type: 'MV'.

Object: To find the effect of manured and unmanured conditions on Paddy varieties.

1. BASAL CONDITIONS

(i) (a) Nil. (b) Paddy. (c) N.A. (i) (a) Clay loam. (b) Refer item 11 on page 2. (iii) 29.12.1950/1/2.1951. (iv) (a) 4 ploughings, ladderig and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) As per treatments. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 3.65'. (x) 14.5.1951.

2. TREATMENTS:

All combinations of (1) and (2)
(1) Two levels of manures: M₀=No manure and M₁=Organic manure at 100 mds. of compost/ac. as basal and A/S at 20 lb/ac. of N as top dressing.
(2) 5 varieties: V₁=DI-4, V₂=FT-10, V₃=CO-13, V₄=Ch-45 and V₅=Ch-47.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 30'x16'. (b) 28'x14'. (v) 1' around. (vi) Yes.

4. GENERAL:

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1947—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1022 lb/ac.
(ii) 900 lb/ac.
(iii) M and V effects are highly significant while their interaction is not 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>
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<td>965</td>
<td>1146</td>
<td>761</td>
<td>1392</td>
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</table>

S.E. of V marginal mean = 67.3 lb/ac.
S.E. of M marginal mean = 42.6 lb/ac.
S.E. of body of table = 95.2 lb/ac.
Crop : Paddy (Kharif).  Ref : C.R.R.I. 50(11).  Type : 'MV'.

Object : To find the effect of five varieties of Paddy in manured and unmanured conditions.

1. BASAL CONDITIONS :
   (i) a) Nil. (b) Paddy. (c) N.A.  (ii) (a) Clay loam. (b) Refer item 11 on page 1.  (iii) 29.12.1950.  (iv) (a) 4 ploughings, laddering and levelling. (b) Broadcast. (c) N.A.  (d) —. (e) —. (f) Nil.  (v) As per treatments.  (vi) Irrigated.  (vii) 2-3 intercultures with Japanese weeder and one hand weeding. (iv) 3.65°.  (x) 3.5.1951.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 2 manures : M1=manured and M0=unmanured.
   (2) 5 varieties: V1=Ch-47, V2=Ch-45, V3=CO-13, V4=DI-4 and V5=PTB-10.

3. DESIGN :
   (i) 2×5 Fact. in R.B.D.  (ii) (a) 10. (b) N.A.  (iii) 4.  (iv) (a) 30°×16'. (b) 28'×14'. (v) 1' alround. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1947—contd.  (b) No. (c) N.A. (d) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1517 lb./ac.
   (ii) 178.2 lb./ac.
   (iii) M and V effects are highly significant while interaction M×V is not 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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<td>1387</td>
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</table>

S.E. of V marginal mean = 63.0 lb./ac;
S.E. of M marginal mean = 39.8 lb./ac;
S.E. of body of table = 89.1 lb./ac.

---

Crop : Paddy (Kharif).  Ref : C.R.R.I. 50(13).  Type : 'MV'.

Object : To compare the effect of A/S on dwarf Japanese type with Chinese and other types.

1. BASAL CONDITIONS :
   (i) (a) Paddy. (b) Paddy. (c) N.A.  (ii) (a) Clay loam. (b) Refer item 11 on page 1.  (iii) 21.6.1950/8.7.1950.  (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 3° to 4°. (e) 1 to 2. (f) Nil.  (vi) As per treatments.  (vii) Irrigated.  (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (iv) 64.47°.  (x) 29.9.1950.

2. TREATMENTS :
   Main-plot treatments :
   3 doses of N as A/S: N0=0, N1=30 and N2=60 lb./ac.
   Sub-plot treatments :

3. DESIGN :
   (i) Split-plot.  (ii) (a) 3 main-plots/replication; 8 sub-plots/main-plot.  (b) 64'×64'. (iii) 4.  (iv) (a) 20'×8'. (b) 18'×6'. (v) 1' alround. (vi) Yes.
4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Straw, height, tiller count and grain yield. (iv) (a) 1950—contd. (b) No, (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1086 lb/ac.
(ii) (a) 291.7 lb/ac. (b) 179.1 lb/ac.
(iii) N effect is significant, V effect is highly significant while interaction is not significant.
(iv) Av. yield of grain in lb/ac.

<table>
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<tr>
<th></th>
<th>V₁</th>
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<th>V₃</th>
<th>V₄</th>
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</table>

S.E. of difference of two
1. N marginal means = 72.9 lb/ac.
2. V marginal means = 73.1 lb/ac.
3. V means at the same level of N = 126.6 lb/ac.
4. N means at the same level of V = 139.1 lb/ac.

Crop: Paddy (Kharij). Ref: C.R.R.I. 52(12). Type: 'MV'.

Object: To study the effect of manuring on the incidence of blast disease of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.7.1952/20, 23.8.1952.
(iv) (a) 2 ploughings, laddering and levelling. (b) Transplanted. (c) (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 56.01° (x) CO-13, 10.11.1952 and others—N.A.

2. TREATMENTS:
Main-plot treatments:
6 varieties: V₁ = CO-13 (early), V₂ = ASD-1 (medium), V₃ = B 76-116 (early), V₄ = T-608 (medium), V₅ = T-1185 (late) and V₆ = T-141 (late).
Sub-plot treatments:
10 manures: M₁ = A/S at 20 lb/ac. of N, M₂ = G.N.C. at 20 lb/ac. of N, M₃ = Compost at 20 lb/ac. of N, M₄ = A/S at 40 lb/ac. of N, M₅ = G.N.C. at 40 lb/ac. of N, M₆ = Compost at 40 lb/ac. of N, M₇ = M₁ + M₂, M₈ = M₃ + M₄, M₉ = M₅ + M₆ and M₁₀ = Control.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/block ; 10 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 18′x 10.5′.
(v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Straw yield, neck infection percentage and grain yield. (iv) (a) 1950—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1177 lb/ac.
(ii) (a) 383.4 lb/ac. (b) 170.6 lb/ac.
(iii) V and M effects are highly significant while their interaction is not significant.
(iv) Av. yield of grain in lb/ac.

<table>
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<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
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<td>1351</td>
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<td>1316</td>
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S.E. of difference of two marginal means:
1. V marginal means
2. M marginal means
3. M means at the same level of V
4. V means at the same level of M

Crop: Paddy (Kharif).  Ref: C.R.R.I. 48(6). Type: 'MV'.

Object: To find the effect of G.N.C. and A/S on Paddy on N basis.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A.  (ii) (a) Clay loam. (b) Refer item II on page 1.  (iii) V₁ on 20.6.1948 and V₂ on 27.6.1948.  (iv) (a) 4 ploughings, laddering and levelling. (b) Broadcast. (c) N.A. (d) and (e) Nil.  (v) Nil.  (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 54.35'.  (x) V₁ on 27.10.1948 and V₂ on 19.11.1948.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties: V₁=T-608 (early) and V₂=T-812 (medium).
   Sub-plot treatments:
   3 applications of N: N₀=0, N₁=40 lb/ac. of N as G.N.C. and N₂=40 lb/ac. of N as A/S.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 8. (iv) (a) 30'x20'. (b) 28'x18'. (v) 1' around. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1947—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1659 lb/ac.
   (ii) (a) 338.3 lb/ac.
   (b) 161.7 lb/ac.
   (iii) N effect is highly significant and interaction N x V is significant. V effect is not significant.
   (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
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<th>N₂</th>
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<td>1861</td>
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Crop: Paddy (Kharif).  Ref: C.R.R.I. 48(7).  Type: 'MV'.
Object: To find the effect of G.N.C. and A/S on transplanted Paddy on N basis.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) V1 on 25.6.1948, V2 on 24.6.1948/V1 on 21.7.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 54.35°. (x) V1 on 29.10.1948 and V2 on 23.11.1948.

2. TREATMENTS:
Main-plot treatments:
2 varieties: V1 = T-608 (early) and V2 = T-812 (medium).
Sub-plot treatments:
3 applications of N: N0 = 0, N1 = 40 lb./ac. of N as G.N.C. and N2 = 40 lb./ac. of N as A/S.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 8. (iv) (a) 30’x20’. (b) 25’x18’. (v) 1’ around. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1947—contd. (b) No. (c) N.A (v) (a), (b) Nil. (vi) and (vii) Nil.1

5. RESULTS:
(i) 2184 lb./ac.
(ii) (a) 168.6 lb./ac.
(b) 102.2 lb./ac.
(iii) V and N effects are highly significant. Interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<td>2277</td>
<td>2396</td>
<td>2184</td>
</tr>
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S.E. of difference of two
1. V marginal means = 48.7 lb./ac.
2. N marginal means = 36.1 lb./ac.
3. N means at the same level of V = 51.1 lb./ac.
4. V means at the same level of N = 64.1 lb./ac.
Crop : Paddy (Kharif).

Ref : C.R.R.I. 51(15). Type : ‘MV’.

Object :—To study the effect of deep layering and surface application of A/S at different levels.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 27.7.1’51. (iv) 4 ploughings, laddering and levelling. (b) Transplanted (c)—. (d) N.A. (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) 65.22’. (a) N.A.

2. TREATMENTS:

Main-plot treatments:

2 varieties : V₁=CO-13 (early) and V₂=T-1145 (medium).

Sub-plot treatments:

7 manures:

M₀=0, M₁=20 lb./ac. of N as A/S (surface), M₂=40 lb./ac. of N as A/S (surface) in single dose, M₃=40 lb./ac. of N as A/S (deep) in single dose, M₄=40 lb./ac. of N as A/S (surface) in double dose and M₅=40 lb./ac. of N as A/S (deep) in double dose.

Fertilizers applied on 17.8.1951 for single dose, while double dose applied on 17.8.1951 (first dose) and 2nd dose on 4.9.1951 (CO-13) and on 27.9.1951 (T-1145).

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/block and 7 sub-plots/main-plot. (b) 6l’-6’x2l’-6’.

3. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Straw yield, height measurement, tiller count and grain yield. (iv) (a) and (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

<table>
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<tr>
<th></th>
<th>M₀</th>
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<th>M₂</th>
<th>M₃</th>
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</table>

S.E. of difference of two

1. V marginal means =142.3 lb./ac.
2. M marginal means =117.2 lb./ac.
3. M means at the same level of V =165.7 lb./ac.
4. V means at the same level of M =209.2 lb./ac.

Crop : Paddy (Kharif).

Ref : C.R.R.I. 49(3). Type : ‘MV’.

Object :—To find the effect of applying A/S in dry and wet conditions in medium soils.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1949/26.7.1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c)—. (d) N.A. (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) 46.00’. (x) V₁ on 20.11.1949 and V₂ on 9.12.1949.
2. TREATMENTS:

Mal-plot treatments:
2 varieties: $V_1 = T \cdot 1145$ (medium) and $V_2 = B A M - 6$ (late).

Sub-plot treatments:
3 applications of N: $N_0 = 0$, $N_1 = 20$ lb. of N as A/S in dry condition at ploughing time on 9.7.1949 and $N_2 = 20$ lb. of N as A/S in wet condition at puddling time on 30.7.1949.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $34' \times 2'$. (b) $32' \times 30'$. (v) 1' around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1949 to 1950. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 170 lb./ac.

(ii) (a) 178.2 lb./ac.
(b) 141.2 lb./ac.

(iii) V effect and interaction N $\times$ V are highly significant. N effect is not significant.

(iv) Av. yield of grain in lb./ac.

<table>
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<th>$N_0$</th>
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<td></td>
<td>1708</td>
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</tbody>
</table>

S.E. of difference of two

1. V marginal means = 72.7 lb./ac.
2. N marginal means = 70.6 lb./ac.
3. N means at the same level of V = 98.8 lb./ac.
4. V means at the same level of N = 109.3 lb./ac.

Crop : Paddy (Kharif), Ref : C.R.R.I. 50(9). Type : 'MV'.

Object : To compare the effect of applying A/S in dry and wet conditions in medium lands.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer from II on page 1. (iii) 16.6 1950/13 14.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) --. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2–3 weedings with Japanese weeder and one hand weeding. (ix) 64.47'. (x) $V_1$ on 14.(10.10.1950 and $V_2$ on 26.11.1950.

2. TREATMENTS:

Main-plot treatments:
2 varieties: $V_1 = B e n i b h o g$ (early) and $V_2 = T 1145$ (medium).

Sub-plot treatments:
3 applications of N: $N_0 = 0$, $N_1 = 20$ lb./ac. of N as A/S in dry condition at ploughing time on 22.6.1950 and $N_2 = 20$ lb./ac. of N as A/S in wet condition at puddling time on 18.7.1950.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block : 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) $32' \times 41'$. (b) $30' \times 39'$. (v) 1' around. (vi) Yes.

4. GENERAL:
(i) Very good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1949—contd. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1841 lb./ac.

(ii) (a) 142.1 lb./ac.
(b) 125.3 lb./ac.

(iii) V effect is highly significant, N effect is significant while interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
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<td>1109</td>
<td>1065</td>
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<tr>
<td>Mean</td>
<td>1667</td>
<td>1968</td>
<td>1889</td>
<td>1841</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. $V$ marginal means = 58.0 lb./ac.
2. $N$ marginal means = 62.7 lb./ac.
3. $N$ means at the same level of $V$ = 48.6 lb./ac.
4. $V$ means at the same level of $N$ = 92.7 lb./ac.

---

Crop - Paddy (Kharif). Ref: C.R.R.I. 49(2). Type = 'MV'.

Object: To find the effect of applying A/S in dry and wet conditions in low soils.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1949/23.7.1949.
   (iv) 4 ploughings, ladderine and levelling. (b) Transplanted. (c) N.A. (d) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2—3 weedications with Japanese weeder and one hand weeding. (ix) 46.00'. (x) $V_1$ on 31.10.1949 and $V_2$ on 14.11.1949.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties: $V_1$ = Benibhog (early) and $V_2$ = T-1145 (medium).
   Sub-plot treatments:
   3 applications of $N$: $N_0$ = 0, $N_1$ = 20 lb./ac. of $N$ as A/S in dry condition at ploughing time on 9.7.1949 and $N_2$ = 20 lb./ac. of $N$ as A/S in wet condition at puddling time on 30.7.1949.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 32'x41'. (b) 30'x39'. (v) 1' allround. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1691 lb./ac.
   (ii) (a) 178.1 lb./ac.
   (b) 155.7 lb./ac.
   (iii) $V$ effect is highly significant. $N$ effect is significant while their interaction is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<td>1547</td>
<td>1821</td>
<td>1705</td>
<td>1691</td>
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</tbody>
</table>

S.E. of difference of two

1. $V$ marginal means = 72.7 lb./ac.
2. $N$ marginal means = 77.8 lb./ac.
3. $N$ means at the same level of $V$ = 110.1 lb./ac.
4. $V$ means at the same level of $N$ = 115.6 lb./ac.
Crop : Paddy (Kharif).  
Ref : C.R.R.I. 50(8).  
Type : "MV".

Object : To compare the effects of applying A/S in dry and wet conditions in low lands.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 19.6.1950/24.7.1950. (iv) (a) 4 ploughings, ladderising and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47'. (x) V1 on 29.11.1950 and V2 on 27.12.1950.

2. TREATMENTS:
   Main-plot treatments :
   2 varieties. V1=T-1145 (medium) and V2=T-1242 (late).
   Sub-plot treatments :
   3 applications of N : N0=0, N1=20 lb./ac. of N as A/S in dry condition at ploughing time on 28.6.1950 and N2=20 lb./ac. of N as A/S in wet condition at puddling time on 197.1950.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 34'x32'. (b) 32'x30'. (v) 1' around. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1948—contd. (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2174 lb./ac.
   (ii) (a) 172.3 lb./ac.
   (b) 130.9 lb./ac.
   (iii) V effect is significant, N effect is highly significant while their interaction is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<th>N2</th>
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</table>

S.E. of difference of two
1. V marginal means = 70.3 lb./ac.
2. N marginal means = 65.5 lb./ac.
3. N means at the same level of V = 92.6 lb./ac.
4. V means at the same level of N = 103.2 lb./ac.

Crop :- Paddy (Kharif).  
Ref :- C.R.R.I. 53(28).  
Type :- "MV".

Object : To test the performance of 24 late duration varieties under normal and high fertility conditions.

1. BASAL CONDITIONS:
   (i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loamy. (b) Refer item 11 on page 1. (iii) 27.6.1953/31.7.1953. (iv) (a) 3 ploughings, ladderising and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2-3 puddlings per hill. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 hand weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   Main-plot treatments :
   2 manurings : M1=Normal manuring: 4000 lb. of G.M. or compost+100 lb. of A/S+100 lb. of Super and M2=Heavy manuring viz. 8000 lb. of G.M. or compost+400 lb. of A/S and 300 lb. of Super.
Sub-plot treatments:


3. DESIGN:

(i) Split-plot. (ii) 2 main plots/replication and 24 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 73.4 lb/arc. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Straw and grain yield, length of panicle, 1000 grains weight. (iv) (a) No. (b) No. (v) Nil. (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 2052 lb/arc. (b) 794.4 lb/arc. (b) 616.5 lb/arc. (i) Only V effect is highly significant. (iv) Av. yield of grain in lb/arc.

<table>
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<th>M₂</th>
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S.E. of difference of two
1. M marginal means = 114.7 lb/arc.
2. V marginal means = 306.2 lb/arc.
3. V means at the same level of M = 435.9 lb/arc.
4. M means at the same level of V = 441.9 lb/arc.

Crop :- Paddy (Kharif).

Ref :- C.R.R.I. 53(29). Type :- ‘MV’.

Object :- To test the performance of certain genetic stocks which were tested under high fertility conditions under different levels of fertility.

1. BASAL CONDITIONS:

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16.6.1953/14.7.1953. (iv) (a) 3 ploughings, laddering and levelling. (b) Transplanted. (c) - (d) 6'x9'. (e) 2 seedling in case of all varieties except AC 250 for which 1 seedling/hill. (v) Green manure dhaincha was buried and puddled. (vi) As per treatments. V₁ to V₉ are early while V₁₀=standard. (vii) Irrigated. (viii) Weeding seed bed on 2.7.1953. Gap filling on 31.7.1953 and 1.8.1953. (ix) N.A. (x) N.A.

2. TREATMENTS:

Main-plot treatments:

2 manurings: M₁=Normal manuring viz., 4000 lb. of compost or G.M., 100 lb. of A/S in two doses and 100 lb. of Super in one dose and M₂=Heavy manuring viz., 8000 lb. of compost or G.M., 400 lb. of A/S in two doses and 300 lb. of Super in 1 dose.
Sub-plot treatments:
20 varieties: $V_1 = AC \text{113}$, $V_2 = AC \text{212}$, $V_3 = AC \text{230}$, $V_4 = AC \text{460}$, $V_5 = AC \text{474}$, $V_6 = AC \text{475}$, $V_7 = AC \text{514}$, $V_8 = AC \text{349}$, $V_9 = AC \text{364}$, $V_{10} = AC \text{484}$, $V_{11} = AC \text{485}$, $V_{12} = AC \text{487}$, $V_{13} = AC \text{472}$, $V_{14} = AC \text{181}$, $V_{15} = AC \text{469}$, $V_{16} = AC \text{467}$, $V_{17} = AC \text{459}$, $V_{18} = AC \text{512}$ and $V_{19} = B \text{76}$ (standard).

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication and 20 sub-plots/main-plot. (b) $64' \times 30'$. (iii) 4. (iv) (a) $14' \times 3'$. (b) $12' \times 2'$. (v) 1 row around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Height of plants, number of effective tillers and grain yield. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 3032 lb./ac. (ii) $> 448.8$ lb./ac. (b) 743.1 lb./ac. (iii) M effect is significant, V effect is highly significant while interaction is not significant. (iv) Av. yield of grain in lb./ac. $M_1 M_2$ $M_3$ Mean $M_4 M_5$ Mean

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S.E. of difference of two
1. M marginal means $= 71.0$ lb./ac.
2. V marginal means $= 371.6$ lb./ac.
3. V means at the same level of M $= 525.5$ lb./ac.
4. M means at the same level of V $= 57.0$ lb./ac.

Crop :- Paddy (Kharif). Ref :- C.R.R.I. 49(10). Type :- 'MV'.

Object :- To compare the effect of three nitrogenous fertilizers at different levels of N on 3 varieties of different durations.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam pH 6.2. (b) Refer item 11 on page 1. (iii) 25.6.1949/24.7.1949. (iv) (a) 2 ploughings, ladderling and levelling. (b) Transplanted. (c) N.A. (d) N.A. (e) 2 to 3. (vi) Nil. (vii) As per treatments. (viii) Irgigated. (ix) Weeding on 9.6.1949. (x) 46.00". (xi) $V_1$ on 3, 4.11.1949, $V_2$ on 17.11.1949 and $V_3$ on 9.12.1949.

2. TREATMENTS:
Main-plot treatments:
3 varieties: $V_1 = T-608$ (early), $V_2 = T-1145$ (medium) and $V_3 = T-90$ (late).
Sub-plot treatments:
All combinations of (1) and (2)+a control ($N_0$)
(1) 2 levels of N: $N_1 = 20$ lb./ac. and $N_2 = 40$ lb./ac.
(2) 3 sources of N: $S_1 = A/S$, $S_2 = A/N$ and $S_3 = Urea$.
Fertilizers applied on 25.7.1949 just after planting.
3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/block ; 7 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20'x16'. (b) 10'x14'. (v) 1' all round. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) 1949—cond. (b) No. (c) N.A. (v) (a), (b) Nil. (vii) and (viii) Nil.

5. RESULTS:
(i) 2118 lb./ac. (ii) (a) 369.9 lb./ac. (v) (b) 213.1 lb./ac. (v) (b) 213.1 lb./ac. (vi) Yes.

6. GENERAL:
(i) Good. (ii) N.A. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) 1949—cond. (b) No. (c) N.A. (v) (a), (b) Nil. (vii) and (viii) Nil.

7. RESULTS:
(i) 2118 lb./ac. (ii) (a) 369.9 lb./ac. (b) 213.1 lb./ac. (v) (b) 213.1 lb./ac. (vi) Yes.

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S.E. of difference of two
1. V marginal means =106.8 lb./ac. 6. S means at the same level of V =106.6 lb./ac.
2. S marginal means =61.3 lb./ac. 7. V means at the same level of S =137.7 lb./ac.
3. N marginal means =50.2 lb./ac. 8. means of the body of N x S table = 87.0 lb./ac.
4. N1, N2 means at the same level of V = 87.0 lb./ac. 9. V means at the level of N2 =171.0 lb./ac.
5. V means at the same level of N1, N2=123.2 lb./ac.

Crop: Paddy (Kharif).
Ref.:- C.R.R.I., 50(2). Type:—‘MV’.

Object:—To compare the effects of four nitrogenous fertilizers at two levels of nitrogen on three varieties of different durations.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) N.A. (b) Refer item 11 on page L. (iii) 21.6.1950/22.7.50. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) N.A. (e) 2 to 3. (v) N.A. (vi) Nil. As per treatments. (vii) Irrigated. (viii) Weeding on 18, 19.8.1950. (ix) 64.47'. (x) V1 on 5, 6.11.1950, V2 on 26.11.1959 and V3 on 15.12.1950.

2. TREATMENTS:
Main-plot treatments:
3 varieties: V1=T-608 (early), V2=T-1145 (medium) and V3=T-90 (late).

Sub-plot treatments:
All combinations of (1) and (2) 4 a control (N0).
(1) 2 levels of N : N1=20 and N2=40 lb./ac.
(2) 4 sources of N : S1=A/S, S2=A/N, S3=Ammex Phos. and S4=Urea.
Fertilizer applied on 29.7.1950 just after transplanting.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plot/block ; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20'x12'. (b) 18'x10'. (v) 1' all round. (vi) Yes.

4. GENERAL:
(i) Satisfactory lodging on 27.10.1950 for V1. (ii) N.A. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) 1949—cond. (b) No. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 1869 lb./ac.

(ii) (a) 522.4 lb./ac.
(b) 271.8 lb./ac.

(iii) V, N and control vs treated effects and interaction S x V are highly significant. S effect is significant. Other effects are not significant.

(iv) Av. yield of grain in lb./ac.

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S.E of difference of two
1. V marginal means = 130.6 lb./ac.
2. S marginal means = 78.5 lb./ac.
3. N marginal means = 55.5 lb./ac.

4. V means at the same level of N1, N2 = 147.2 lb./ac.
5. N means at the same level of V = 96.1 lb./ac.
6. S means at the same level of V = 135.9 lb./ac.
7. N means at the same level of N = 111.0 lb./ac.
8. V means at the same level of S = 175.8 lb./ac.

Crop: Paddy (Kharif). Ref: C.R.R.I. 51(2). Type: 'MV'.

Object: To compare the effects of four nitrogenous fertilizers at two levels of nitrogen on three varieties of different durations.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item II on page 1. (iii) 17.6.1951/24.7.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Blank planting. (c) —. (d) N.A. (e) Nil. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Weeding on 17.8.51. (ix) V1 on 7.11.1951, V2 on 20.11.1951 and V3 on 12.12.1951.

2. TREATMENTS:

Main-plot treatments:
3 varieties: V1 = T-608 (early), V2 = T-1145 (medium) and V3 = T-90 (late).

Sub-plot treatments:
All combinations of (1) and (2) + a control (N0)
(1) 2 levels of N: N1 = 20 and N2 = 40 lb./ac.
(2) 4 sources of N: S1 = A/S, S2 = A/N, S3 = Ammo. Phos, and S4 = Urea.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' x 12'. (b) 18' x 10'. (v) l' all round. (vi) Yes.

4. GENERAL:

Satisfactory. Lodging on 27.11.1951 in measured plots (T-90) and on 29.10.1951 (T-1143). (ii) N.A.

(iii) Straw and paddy yield, height, tillers and ear-length. (iv) (a) Yes; 1949—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 2019 lb./ac.

(ii) (a) 439.7 lb./ac.
(b) 175.8 lb./ac.

(iii) V, S and control vs measured effects are highly significant. Other effects are not significant.
(iv) Av. yield of paddy in lb./ac.

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S.E. of the difference of two

1. V marginal means = -109.9 lb./ac. 6. S means at the same level of V = 88.0 lb./ac.
2. S marginal means = 50.8 lb./ac. 7. V means at the same level of S = 133.7 lb./ac.
3. N marginal means = 35.9 lb./ac. 8. means of the boot of N x S table = 71.8 lb./ac.
4. N1, N2 means at the same level of V = 62.2 lb./ac. 9. V means at the level of N0 = 156.5 lb./ac.
5. V means at the same level of N1, N2 = 118.4 lb./ac.

Crop : Paddy (Kharif).

Ref : C.R.R.I. 52(8). Type : 'MV'.

Object : To compare the effects of five nitrogenous fertilizers of different nitrogen levels on two varieties of different durations.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam, (b) Refer item 11 on page 1. (iii) 16.6.1952/28.7.1952.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) --. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 50.03'. (x) V1 on 27.11.1952 and V3 on 8.12.1952.

2. TREATMENTS :
   Main-plot treatments :
   2 varieties : V1= T-1145 (medium) and V2= T-90 (late).
   Sub-plot treatments :
   All combinations of (1) and (2)+ a control (N0)
   (1) 2 levels of N : N1= 20 and N2= 40 lb./ac.
   (2) 5 sources of N : S1= A/S, S2= A/N, S3= Ammon. Phos., S4= Ammon. chloride and S5= Urea.
   Fertilizers applied on 11.8.1952 after transplanting.

3. DESIGN :
   (i) Split-plot. (ii) (a) 2 main-plots/block : 11 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 25' x 10'. (b) 25' x 8'. (c) 1' in each side. (vi) Yes.

4. GENERAL :
   (i) Not very satisfactory. (ii) N.A. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1736 lb./ac.
   (ii) (a) 108.4 lb./ac.
   (b) 182.6 lb./ac.
   (iii) S and control vs. measured effects, and interactions N x S, N x V and N x S x V are significant. Other effects are not significant.
(iv) Av. yield of grain in lb./ac.

\[ V_1 \] \[ N_1 = 1013 \text{ lb./ac.} \]
\[ V_2 \] \[ N_2 = 1641 \text{ lb./ac.} \]

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<td>[ \text{Mean} ]</td>
<td>1830</td>
<td>1695</td>
<td>1919</td>
<td>1762</td>
<td>1703</td>
<td>1762</td>
<td>1602</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>1626</td>
<td>1548</td>
<td>1725</td>
<td>1604</td>
<td>1508</td>
<td>1508</td>
<td>1508</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>2034</td>
<td>1841</td>
<td>2114</td>
<td>1919</td>
<td>1903</td>
<td>1903</td>
<td>1903</td>
</tr>
</tbody>
</table>

S.E. of the difference of two

1. V marginal means = 24.24 lb./ac. 6. S means at the same level of \( V = 91.30 \) lb./ac.
2. S marginal means = 64.56 lb./ac. 7. V means at the same level of \( S = 85.81 \) lb./ac.
3. N marginal means = 40.83 lb./ac. 8. Means of the bot y of \( N \times S \) table = 91.30 lb./ac.
4. \( N_1, N_2 \) means at the same level of \( V = 57.74 \) lb./ac. 9. V means at the level of \( N_0 = 125.26 \) lb./ac.
5. V means at the same level of \( N_1, N_2 = 47.48 \) lb./ac.

Crop: Paddy (Kharij).
Ref: C.R.R.I. 48(8).
Type: 'MV'.

Object:—To compare the effect of the time of application of manures and mixtures of manures at different levels of N on different varieties.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 25.6.1948/22.7.1948.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) N.A. (e) 2-3. (f) Nil. (g) As per treatments. (h) Irrigated. (i) 2-3 intercultures with Japanese weeder and one hand weeding. (j) 54.35'. (k) \( V_1 \) on 9.11.1948 and \( V_2 \) on 21.12.1948.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties: \( V_1 = T-608 \) (early) and \( V_2 = T-1242 \) (late).
   Sub-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 2 levels of N: \( N_1 = 20 \) and \( N_2 = 40 \) lb./ac.
   (2) 3 sources of N: \( S_1 = A/S, S_2 = A/N \) and \( S_3 = A/S + A/N \) in equal ratio of N.
   (3) 3 times of application: \( T_1 = \text{Full at planting}, T_2 = \text{Half at planting and half at one month after planting} \).

3. DESIGN:
   (i) Splits-plot. (ii) 2 main-plots/block; 18 sub-plots/main-plot. (iii) \( 4 \). (iv) \( 5' \times 32' \). (b) \( 3' \times 30' \). (v) \( 1' \) around. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) 1948 to 1950.
   (b) No. (c) N.A. (d) Nil. (e) Nil. (f) Nil. (g) Results are presented as available.

5. RESULTS:
   (i) 2326 lb./ac.
   (ii) (a) 659.5 lb./ac.
   (b) 237.2 lb./ac.
   (iii) V effect is highly significant. T effect is significant. Others are not significant.
Crop :- Paddy (Kharif).  
Ref :- C.R.R.I. 48(12).  
Type :- 'MV'.

Object :- To compare the effect of the time of application of manures and mixture of manures at different N levels on different varieties.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18.6.1949/28, 29.7.1949. 
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) -.. (d) N.A. (e) 2 to 3
   (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2 to 3 interculturcs with Japanese weeder and one hand weeding. (ix)
   (x) 46.00'.

2. TREATMENTS :
   Main-plot treatments :
   2 varieties: V₁=T-608 (early) and V₂=T-1242 (late).
   Sub-plot treatments :
   All combinations of (1), (2) and (3) + a control (N₀).
   (1) 2 levels of N : N₂=20 and N₃=40 lb./ac.
   (2) 3 sources of N : S₁=A/S, S₂=A/N and S₃=A/S+A/N in equal ratio of N.
   (3) 3 times of application of N : T₁=Full at planting, T₂=Full at one month after planting and T₃=Half at planting and half at one month after planting.

3. DESIGN :
   (i) Split-plot. (ii) (a) 2 main-plots/block and 19 sub-plots/main-plot. (iii) 4. (iv) (a) 5'x32', (b) 3'x30'.
   (v) One foot all round. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) Nil. (iii) Straw and grain yield, height, tillers and ear-length. (iv) (a) 1948 to 1950. (b) No.
   (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1799 lb./ac.
   (ii) 1334.6 lb./ac.
   (iii) 209.3 lb./ac.

(ii) V, N, T and S effects are significant.
(iv) Av. yield of grain in lb./ac.

\[ V_1 N_0 = 862 \text{ lb./ac. and } V_2 N_0 = 1946 \text{ lb./ac.} \]

<table>
<thead>
<tr>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>N1</th>
<th>N2</th>
<th>V1</th>
<th>V2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1752</td>
<td>2045</td>
<td>1941</td>
<td>1722</td>
<td>2076</td>
<td>1205</td>
<td>2623</td>
<td>1914</td>
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<td>1592</td>
<td>1892</td>
<td>1834</td>
<td>1699</td>
<td>1847</td>
<td>1113</td>
<td>2433</td>
<td>1873</td>
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<td>1571</td>
<td>1899</td>
<td>1859</td>
<td>1704</td>
<td>1849</td>
<td>1128</td>
<td>2425</td>
<td>1776</td>
</tr>
<tr>
<td>Mean</td>
<td>1638</td>
<td>1945</td>
<td>1878</td>
<td>1718</td>
<td>1924</td>
<td>1149</td>
<td>2494</td>
</tr>
</tbody>
</table>

V1 1070 1200 1171
V2 2207 2691 2585

S.E. of the difference of two
1. V marginal means 189.1 lb./ac.
2. N marginal means 46.7 lb./ac.
3. S or T marginal means 57.2 lb./ac.
4. V means at the level of N 266.6 lb./ac.

S.E. of the difference of two
4. V means at the level of N = 99.1 lb./ac.

Crop: Paddy (Kharif)
Ref: CRRI. 50(10)
Type: ‘MV’

Object: To compare the effect of time of application of manures and mixture of manures at different N levels on different varieties.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (d) Clay loam. (e) Refer item 11 on page 1. (f) 23, 24, 27.5, 1950. (g) 4 ploughings, ladderine and levelling. (h) Transplanted. (i) D.A. (j) e to 3. (k) Nil. (l) As per treatments. (m) Irrigated. (n) 2 to 3 intercultures with Japanese weeder and one hand weeding. (o) 64.47'. (p) V1 on 6.11.1950 and V2 on 20.12.1950.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties : V1 = T-608 (early) and V2 = T-1242 (late).
   Sub-plot treatments:
   All combinations of (1), (2) and (3) + a control (N0).
   (1) 2 levels of N: N1 = 20 and N2 = 40 lb./ac.
   (2) 3 sources of N: S1 = A/S, S2 = A/N and S3 = A/S + A/N in equal ratio of N.
   (3) 3 times of applications of T1 = Full at planting, T2 = Full at one month after planting and T3 = Half at planting and half at one month after planting.

3. DESIGN:
   (a) Split-plot. (b) 2 main-plots/block and 19 sub-plots/main-plot. (c) N.A. (d) 4, (e) 5' x 32'. (f) 3' x 30'. (g) 1 foot all round. (h) Yes.

4. GENERAL:
   (a) Satisfactory. (b) Nil. (c) Straw and grain yield, height, tillers and ear-length. (d) (a) 1948 to 1950. (e) Nil. (f) N.A. (g) v) and (h) Nil. (v) Nil. (w) Results are presented as available.

5. RESULTS:
   (a) 2056 lb./ac.
   (b) 440.8 lb./ac.
   (c) 221.6 lb./ac.
   (d) V, S, T and N effects are 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>N₁</th>
<th>N₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>1597</td>
<td>2271</td>
<td>2056</td>
<td>2168</td>
<td>1987</td>
<td>2228</td>
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<td>S₂</td>
<td>1918</td>
<td>2042</td>
<td>2006</td>
<td>1999</td>
<td>1837</td>
<td>2120</td>
</tr>
<tr>
<td>S₃</td>
<td>2018</td>
<td>2158</td>
<td>2171</td>
<td>2116</td>
<td>2014</td>
<td>2218</td>
</tr>
<tr>
<td>Mean</td>
<td>1979</td>
<td>2157</td>
<td>2078</td>
<td>2071</td>
<td>1953</td>
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<td>V₁</td>
<td>1341</td>
<td>1527</td>
<td>1438</td>
<td>1415</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V₂</td>
<td>2614</td>
<td>2787</td>
<td>2718</td>
<td>2706</td>
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<td></td>
</tr>
</tbody>
</table>

S.E. of the difference of two
1. V marginal means = 73.5 lb./ac.
2. N marginal means = 36.9 lb./ac.
3. S or T marginal means = 45.2 lb./ac.
4. V means at the level of N = 168.5 lb./ac.

Crop Ξ Paddy (Kharij).
Ref Ξ C.R.R.I. 51(11). Type Ξ 'C'.

Object:—To study the effect of crop sequence and work out its economic value.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A.
   (ii) (a) Clay loam. (b) Refer item 11 on page 1.
   (iii) 13.6.1951/17.7.1951.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil.

2. TREATMENTS:
   1. Paddy-paddy.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 30’x20’. (b) 28’x18’. (v) 1’ around. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. Lodging on 29.9.1951. (ii) Nil. (iii) Straw, height, tillers and ear-length and grain yield. (iv) and (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Treatment no. 2 omitted from analysis.

5. RESULTS:
   (i) 1288 lb./ac.
   (ii) 195.3 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment Av. yield
   1. 1299
   2. No yield
   3. 1277
   S.E./mean = 68.5 lb./ac.

Crop Ξ Paddy (Kharij).
Ref Ξ C.R.R.I. 50(17). Type Ξ ‘C’.

Object:—To determine the crop sequence in double cropped land.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) Bulk planting. (e) 2 to 3. (v) Nil. (vi) Ch-47 (early). (vii) Irrigated. (viii) 2—3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47°. (x) N.A.
2. TREATMENTS:
2. Benibhog-Fallow followed by 2nd crop of paddy.
4. Fallow followed by a crop of T-1242, followed by 2nd crop of paddy.
5. G.M. followed by T-1242, followed by 2nd crop of paddy.
6. Fallow followed by a crop of T-1145, followed by 2nd crop of paddy.
7. G.M. followed by T-1145 followed by 2nd crop of paddy.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) Yes: 1950—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2977 lb./ac.
(ii) 328.3 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>12850</td>
<td>5.</td>
<td>3889</td>
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<tr>
<td>2.</td>
<td>2390</td>
<td>6.</td>
<td>3717</td>
</tr>
<tr>
<td>3.</td>
<td>2703</td>
<td>7.</td>
<td>2949</td>
</tr>
<tr>
<td>4.</td>
<td>3638</td>
<td>S.E./mean</td>
<td>164.2 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Paddy (Khari). Ref:- C.R.R.I. 51(19). Type :- 'C'.

Object :- To determine the crop sequence in double cropped lands.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, ladderling and levelling. (b) Transplanted. (c) —. (d) Bulk planting. (e) 2 to 3. (v) Nil. (vi) Ch-47 (early). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 65.32'. (x) N.A.

2. TREATMENTS:
2. Ch-47 followed by fallow, followed by 2nd crop of paddy.
4. Fallow followed by T-1242, followed by 2nd crop of paddy.
5. G.M. followed by T-1242, followed by 2nd crop of paddy.
6. Fallow followed by T-1145, followed by 2nd crop of paddy.
7. G.M. followed by T-1145, followed by 2nd crop of paddy.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 15'X64'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) Yes, 1950—contd. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 2067 lb./ac.
(ii) 228.0 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1466</td>
<td>5.</td>
<td>2557</td>
</tr>
<tr>
<td>2.</td>
<td>1213</td>
<td>6.</td>
<td>2321</td>
</tr>
<tr>
<td>3.</td>
<td>1316</td>
<td>7.</td>
<td>2757</td>
</tr>
<tr>
<td>4.</td>
<td>2839</td>
<td>S.E./mean</td>
<td>114.0 lb./ac.</td>
</tr>
</tbody>
</table>
Crop : Paddy.  
Ref : C.R.R.I. 52(18).  
Type : 'C'.

Object :—To determine the crop sequence in double cropped land.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Paddy.  (c) N.A.  (ii) (a) Clay loam.  (b) Refer item 11 on page 1.  (iii) N.A.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanted.  (c) —.  (d) Bulk planting.  (e) 2 to 3.  (v) Nil.  
   (vi) T-1242 (late).  (vii) Irrigated.  (viii) 2 to 3 intercultures with Japanese rotary weeder and hand weeding.  (ix) 35.63°.  (x) N.A.

2. TREATMENTS:
   1. Jute followed by G.M. and then 2nd crop of Paddy.
   2. Benibhog followed by fallow and then 2nd crop of Paddy.
   3. Benibhog followed by G.M. and then 2nd crop of Paddy.
   4. Fallowed followed by T-1242 and then 2nd crop of Paddy.
   5. G.M. followed by T-1242 and then 2nd crop of Paddy.
   6. Fallow followed by T-1145 and then 2nd crop of Paddy.
   7. G.M. followed by T-1145 and then 2nd crop of Paddy.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) N.A.  (iii) 4.  (iv) (a) 64'x15'.  (b) N.A.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  (ii) N.A.  (iii) Straw, height, tillers, length of the ear head and grain yield.  (iv) (a) No.  (b) and (c) —.  (v) (a) and (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   
   First Crop  
   Treatment Av. yield  
   1. 510  
   2. 203  
   3. 219  
   4. 2092  
   5. 2574  
   6. 1750  
   7. 1679  
   S.E./mean = 145.6 lb./ac.

   Second Crop  
   Treatment Av. yield  
   1. 1210  
   2. 711  
   3. 1097  
   4. 657  
   5. 682  
   6. 729  
   7. 740  
   S.E./mean = 64.1 lb./ac.

Crop : Paddy (Kharif).  
Ref : C.R.R.I. 48(11).  
Type : 'C'.

Object :—To find the effect of transplanting Paddy on ridges as practised in Korea.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Paddy.  (c) N.A.  (ii) (a) Clay loam.  (b) Refer item 11 on page 1.  (iii) N.A.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanted.  (c) —.  (d) N.A.  (e) 2 to 3.  (v) Nil.  
   (vi) T-1242.  (vii) Irrigated.  (viii) 2-3 intercultures with Japanese weeder and one hand weeding.  
   (ix) 35.63°.  (x) 28.11.1948.

2. TREATMENTS:
   1. Korean method of planting i.e. transplanting on 2' ridges alternate with 6' channels.
   2. Ordinary method of transplanting.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 2.  (b) N.A.  (iii) 16.  (iv) (a) 8'x24'.  (b) 7.5'x19.5'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  (ii) Nil.  (iii) Straw, height, tillers, length of the ear head and grain yield.  (iv) (a) No.  (b) and (c) —.  (v) (a) and (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 3452 lb./ac.  
   (ii) 174.7 lb./ac.  
   (i) Treatment difference is highly significant.
Crop :- Paddy (*Kharif*).

Object :- To find the effect of summer ploughing on Paddy crop in medium soil.

### 1. BASAL CONDITIONS :
- (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 23.6.1949/29. 30.7.1949. (iv) (a) 7 ploughings, (b) Transplanting. (c) Nil. (d) and (e) N.A. (v) Nil. (vi) B.A.M. 6 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding on 22, 21.9.1949. (ix) 46.00°. (x) N.A.

### 2. TREATMENTS :
- 1. Summer ploughing.
- 2. Summer fallow.

### 3. DESIGN :
- (i) R.B.D. (ii) 2. (b) N.A. (iii) 12. (iv) (a) 12' x 104'. (b) 10' x 102'. (v) 1' alround. (vi) Yes.

### 4. GENERAL :
- (i) Satisfactory. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1948—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

### 5. RESULTS :
- (i) 1936 lb./ac.
- (ii) 186.0 lb./ac.
- (iii) Treatment difference is not significant.

---

### 69

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield of grain in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3258</td>
</tr>
<tr>
<td>2.</td>
<td>3646</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 43.7 lb./ac.</td>
</tr>
</tbody>
</table>

---
Crop :- Paddy (Kharij).
Ref :- C.R.R.I. 51(18). Type :- 'C'.

Object :- To find out the optimum seed rate for the aman crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer from item 11 on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) As per treatments. (d) N.A. (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) 65.3°. (x) N.A.

2. TREATMENTS:
   4 seed rates: \( R_1 = 40, R_2 = 60, R_3 = 80 \) and \( R_4 = 100 \) lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 90' x 29'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—contd. (b) N.A. (c) —. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2073 lb/ac.
   (ii) 261.9 lb/ac.
   (iii) Treatments are significantly different.

   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R_1 )</td>
<td>1836</td>
</tr>
<tr>
<td>( R_2 )</td>
<td>1965</td>
</tr>
<tr>
<td>( R_3 )</td>
<td>2290</td>
</tr>
<tr>
<td>( R_4 )</td>
<td>2199</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>( = 106.9 ) lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Paddy (Kharij).
Ref :- C.R.R.I. 48(4). Type :- 'C'.

Object :- To study the effect of single and double transplanting of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 30.6.1948/30.7.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 9" x 9". (e) 1. (f) Nil. (vi) FR 43 B (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 54.3°. (x) N.A.

2. TREATMENTS:
   1. Single transplanting of 30 days old seedlings.
   2. Single transplanting of 60 days old seedlings.
   3. Double transplanting, 1st when 30 days old and 2nd when 60 days old.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 10' x 50'. (b) 9' x 48'. (v) 1 row around. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Straw, height, tillers and ear-length and grain yield. (iv) (a) 1945—contd. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 1930 lb./ac.
(ii) 1442 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2301</td>
</tr>
<tr>
<td>2.</td>
<td>1646</td>
</tr>
<tr>
<td>3.</td>
<td>1842</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=51.0 lb./ac.</td>
</tr>
</tbody>
</table>

Object:—To find out the best preceding crop to get the maximum Paddy yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) As per treatments. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1952/17.7.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) Bradshog (early). (vii) Irrigated. (viii) 2 to 3 interculturing with Japanese weeder and one hand weeding. (ix) 56.03°. (x) 22.10.1952.

2. TREATMENTS:

9 previous crops: C0 = Fallow, C1 = Paddy, C2 = Wheat, C3 = Groundnut, C4 = Cotton, C5 = Rye, C6 = Tori, C7 = Moong for seed and C8 = Moong as G.M.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 20'x30', (b) 18'x28'. (v) 1' around. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Height, ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1951—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1456 lb./ac.
(ii) 1541 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>
</tr>
</thead>
<tbody>
<tr>
<td>C0</td>
<td>1483</td>
</tr>
<tr>
<td>C1</td>
<td>1377</td>
</tr>
<tr>
<td>C2</td>
<td>1465</td>
</tr>
<tr>
<td>C3</td>
<td>1479</td>
</tr>
<tr>
<td>C4</td>
<td>1564</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=77.1 lb./ac.</td>
</tr>
</tbody>
</table>

Object:—To find out the best preceding crop to get the maximum Paddy yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) As per treatments. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 22.6.1953/13.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 9'x6'. (e) 2 to 3. (v) Nil. (vi) 9.7. (vii) 10 (early). (viii) Irrigated. (ix) 2 to 3 intercultures with Japanese weeder and one hand weeding. (x) 46.02°. (x) 6.7.10.53.

2. TREATMENTS:

9 previous crops: C0 = Fallow, C1 = Paddy, C2 = Wheat, C3 = Groundnut, C4 = Cotton, C5 = Rye, C6 = Tori, C7 = Moong for seed and C8 = Moong as G.M.
3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 20'x30'. (b) 18'x28'. (v) 1' all round. (vi) Yes.
4. GENERAL:
(i) Good. (ii) N.A. (iii) Height, ear-length measurements, no. of tillers, straw and grain yield. (iv) (a) 1951--cond. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.
5. RESULTS:
(i) 2696 lb./ac. (ii) 328.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac. (v) Crop: Paddy (Kharif). Ref: C.R.R.I. 53(24). Type: 'C'.

Object: To determine the suitable time of transplanting and broadcasting.

1. BASAL CONDITIONS:
(i) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 4.7.1953 and 19.7.1953/8.8.1953 and 23.8.1953. (iv) 4 ploughings, laddering and levelling. (v) As per treatments. (c) N.A. (d) 6'x6'. (e) 2. (v) 8000 lb./ac. of dhaincha. (vi) T-90 and T-1242 (late). (vii) Irrigated. (viii) Gap filling on 16.8.1953 and weeding on 3.9.1953. (ix) N.A. (x) N.A.

2. TREATMENTS:
T1=Sown on 4.7.1953 and transplanted on 8.8.1953, T2=Sown on 19.7.1953 and transplanted on 23.8.1953, T3=Broadcast and puddled on 19.7.1953.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 3'x14'. (v) 1 row all round. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Number of plants, number of ear-heads and weight of straw and grain. (iv) (a) No. (b). (c) N.A. (v) Nil. (vi) N.A. (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>C0</td>
<td>2823</td>
<td>C3</td>
<td>2938</td>
</tr>
<tr>
<td>C1</td>
<td>2358</td>
<td>C4</td>
<td>2019</td>
</tr>
<tr>
<td>C2</td>
<td>2449</td>
<td>C5</td>
<td>2826</td>
</tr>
<tr>
<td>C3</td>
<td>2634</td>
<td>C6</td>
<td>2520</td>
</tr>
<tr>
<td>C4</td>
<td>2704</td>
<td>S.E./mean</td>
<td>164.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif). Ref: C.R.R.I. 53(25). Type: 'C'.

Object: To determine the suitable time of planting and broadcasting.

1. BASAL CONDITIONS:
2. TREATMENTS:

T₁ - Sown on 23.6.1953 and transplanted on 2.8.1953.
T₂ - Sown on 10.7.1953 and transplanted on 19.8.1953.
T₃ - Broadcast and puddled on 19.7.1953.

3. DESIGN:

(i) B.B.D. (ii) (a) 3 for each variety. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 31 x 14'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Number of ears/plant, weight of straw and grain. (iv) (a) to (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

Croptype: Paddy (Kharif).

Object: To determine the optimum time of planting and age of seedling.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paaddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) As per treatments. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) - (d) Bulk planting. (e) 2 to 3. (v) 3000-4000 lb. of G.M. in s;tu was applied to the whole experiment. (vi) T-1145 (medium) and T-90 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00". (x) N.A.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Variety: T-1145 (medium)</th>
<th>Treatment</th>
<th>Variety: T-90 (late)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of seedlings in days</td>
<td>Date of planting</td>
<td>Age of seedlings in days</td>
<td>Date of planting</td>
</tr>
<tr>
<td>1.</td>
<td>30</td>
<td>13.7.1949</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>40</td>
<td>23.7.1949</td>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
<td>30</td>
<td>23.7.1949</td>
<td>3.</td>
</tr>
<tr>
<td>5.</td>
<td>30</td>
<td>6.8.1949</td>
<td>5.</td>
</tr>
<tr>
<td>7.</td>
<td>20</td>
<td>10.8.1949</td>
<td>7.</td>
</tr>
<tr>
<td>10.</td>
<td>35</td>
<td></td>
<td>10.</td>
</tr>
</tbody>
</table>

3. DESIGN:

(i) C.R.D. (ii) (iii) Each treatment replicated 7 times for each variety. (iv) (a), (b) N.A. (v) N.A. (vi) N.A.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—contd. (b) No. (c) Nil. (v) N.A. (vi) N.A. and (vii) Nil.

5. RESULTS:

Variety T-1145

(i) 2554 lb./ac. (ii) 262.6 lb./ac. (iii) Treatment differences are highly significant.

Variety T-90

(i) 2200 lb./ac. (ii) 202.8 lb./ac. (iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2048</td>
<td>5.</td>
<td>2681</td>
<td>1.</td>
<td>2700</td>
<td>6.</td>
<td>2100</td>
</tr>
<tr>
<td>2.</td>
<td>2529</td>
<td>6.</td>
<td>2737</td>
<td>2.</td>
<td>2590</td>
<td>7.</td>
<td>2185</td>
</tr>
<tr>
<td>3.</td>
<td>2033</td>
<td>7.</td>
<td>2274</td>
<td>3.</td>
<td>2590</td>
<td>8.</td>
<td>2134</td>
</tr>
<tr>
<td>4.</td>
<td>2725</td>
<td>8.</td>
<td>2604</td>
<td>4.</td>
<td>2435</td>
<td>9.</td>
<td>2123</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>99.3 lb./ac.</td>
<td>S.E./mean</td>
<td>76.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharij).


Object: To determine the optimum time of planting and age of seedling.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item I on page 1. (iii) N.A. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) Bulk planting. (e) 2 to 3. (v) Nil. (vi) T-1145 (medium) and T-90 (late). (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one band weeding. (ix) 65.32'. (x) N.A.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Variety</th>
<th>T-1145</th>
<th>Variety</th>
<th>T-90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Sowing date</td>
<td>Age of seedlings</td>
<td>Planting date</td>
</tr>
<tr>
<td>1.</td>
<td>10.6.1951</td>
<td>40 days</td>
<td>20.7.1951</td>
</tr>
<tr>
<td>2.</td>
<td>20.6.1951</td>
<td>30 days</td>
<td>20.7.1951</td>
</tr>
<tr>
<td>3.</td>
<td>20.6.1951</td>
<td>40 days</td>
<td>30.7.1951</td>
</tr>
<tr>
<td>4.</td>
<td>30.6.1951</td>
<td>30 days</td>
<td>20.7.1951</td>
</tr>
<tr>
<td>5.</td>
<td>30.6.1951</td>
<td>40 days</td>
<td>9.8.1951</td>
</tr>
<tr>
<td>6.</td>
<td>9.7.1951</td>
<td>30 days</td>
<td>9.8.1951</td>
</tr>
<tr>
<td>7.</td>
<td>9.7.1951</td>
<td>40 days</td>
<td>19.8.1951</td>
</tr>
<tr>
<td>9.</td>
<td>19.7.1951</td>
<td>40 days</td>
<td>29.8.1951</td>
</tr>
<tr>
<td>10.</td>
<td>29.7.1951</td>
<td>30 days</td>
<td>29.8.1951</td>
</tr>
</tbody>
</table>

Above treatments applied under manured and unmanured conditions for both the varieties separately.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 8. (iv) (a) 29'x3'.5'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) to (iv) Av. yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Variety T-1145</th>
<th>Variety T-90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Un-manured</td>
<td>Manured</td>
<td>Un-manured</td>
</tr>
<tr>
<td>1.</td>
<td>1712</td>
<td>2065</td>
</tr>
<tr>
<td>2.</td>
<td>1739</td>
<td>2032</td>
</tr>
<tr>
<td>3.</td>
<td>1975</td>
<td>2228</td>
</tr>
<tr>
<td>5.</td>
<td>1902</td>
<td>2201</td>
</tr>
<tr>
<td>6.</td>
<td>1842</td>
<td>2201</td>
</tr>
<tr>
<td>7.</td>
<td>1739</td>
<td>2119</td>
</tr>
<tr>
<td>8.</td>
<td>1739</td>
<td>2065</td>
</tr>
<tr>
<td>9.</td>
<td>1603</td>
<td>1602</td>
</tr>
<tr>
<td>10.</td>
<td>1521</td>
<td>1848</td>
</tr>
<tr>
<td>Mean</td>
<td>1749</td>
<td>2070</td>
</tr>
<tr>
<td>C.D. (.05)</td>
<td>140.7 lb./ac.</td>
<td>140.5 lb./ac.</td>
</tr>
</tbody>
</table>

Treatment differences under manured and unmanured conditions are significant for both varieties.
Crop: Paddy (Kharif).  
Ref: C.R.R.I. 52(17).  
Type: 'C'.

Object: To determine the optimum time of planting and age of seedling.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Paddy.  (c) N.A.  (ii) (a) Clay loam.  (b) Refer item 11 on page 1.  (iii) As per treatments.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanted.  (c) → (d) N.A.  (e) 2-3.  (v) 100 lb./ac. of A.S.  (vi) T-1145 and T-90.  (vii) Irrigated.  (viii) 2-3 intercultures with Japanese weeder and one hand weeding.  (ix) 56.03'.  (x) N.A.

2. TREATMENTS:
   Variety   T-1145   Variety   T-90
   Treatment   Sowing date   Age of seedlings   Planting date   Sowing date   Age of seedlings   Planting date
   1. 10.6.1952   40 days   20.7.1952   10.6.1952   45 days   25.7.1952
   2. 20.6.1952   30 days   20.7.1952   20.6.1952   35 days   27.7.1952
   3. 20.6.1952   40 days   30.7.1952   25.6.1952   45 days   9.8.1952
   4. 30.6.1952   30 days   30.7.1952   4.7.1952   35 days   9.8.1952
   7. 9.7.1952   40 days   19.8.1952   24.7.1952   35 days   8.9.1952
   9. 19.7.1952   40 days   29.8.1952   8.8.1952   45 days   23.9.1952
   10. 29.7.1952   30 days   20.8.1952   18.8.1952   35 days   23.9.1952

Above treatments applied under manured and unmanured conditions for both the varieties separately.

3. DESIGN:
   (i) R.B.O.  (ii) (a) 10.  (b) N.A.  (iii) 8.  (iv) (a) 31'x5.5'.  (b) 29'x3.5'.  (v) 1' around.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1949—contd.  (v) No.  (c) No.  (v) (a) and (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) to (iv)
   Variety   T-1145   Variety   T-90
   Treatment   manured   Unmanured   manured   Unmanured
   1. 1746   1178   2683   1800
   2. 1766   1257   2541   1807
   3. 1576   1243   2296   1576
   4. 1732   1167   2459   1637
   5. 1685   1325   2031   1229
   6. 1549   1379   1841   1229
   7. 1665   985   1644   1236
   8. 1596   1066   1542   1086
   9. 1216   1097   1073   652
   10. 1277   1060   1026   743
   G.M. 1581   1176   1914   1297
   S.E./mean 7.39 lb./ac.   2.99 lb./ac.   4.41 lb./ac.   2.65 lb./ac.
   Significance H.S.   H.S.   H.S.   H.S.

Crop: Paddy (Kharif).  
Ref: C.R.R.I. 49(7).  
Type: 'C'.

Object: To find the possibilities of growing two crops of Paddy on the same land.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Paddy.  (c) Nil.  (ii) (a) Clay loam.  (b) Refer item 11 on page 1.  (iii) 24.6.1949/20.7.1949.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanted.  (c) → (d) N.A.  (e) 2 to 3.  (v) Nil  (vi) V1 = Benihong (early) and V2 = T-1145 (medium).  (vii) Irrigated.  (viii) 2-3 intercultures with Japanese weeder and one hand weeding on 30.8.1949.  (ix) 46.00'.  (x) V1 on 16.10.1949 and V2 on 16.11.1949.

2. TREATMENTS:
   T1=G.M.—Long Paddy—Short Paddy, T2=Short Paddy—G.M.—Short Paddy and T3=Short Paddy—Short Paddy.
3. DESIGN:
(i) R.B.D. (ii) (a) 3, (b) N.A. (iii) 8. (iv) (a) 22' x 66', (b) 20' x 64'. (v) 1' around. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Height, tiller, ear-length, grain and straw yield. (iv) (a) No, (b) —. (v) (a) (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1573 lb./ac.
(ii) 74.32 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Crop</th>
<th>1st crop</th>
<th>2nd crop</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>1465</td>
<td>1487</td>
<td>1472</td>
</tr>
<tr>
<td>T2</td>
<td>1445</td>
<td>2025</td>
<td>1554</td>
</tr>
<tr>
<td>T3</td>
<td>1554</td>
<td>1308</td>
<td>1573</td>
</tr>
<tr>
<td>Mean</td>
<td>1456</td>
<td>1756</td>
<td>1573</td>
</tr>
</tbody>
</table>

S.E. of T marginal means = 18.58 lb./ac.
S.E. of body of table = 26.28 lb./ac.


Object: —To observe the effect of planting early susceptible variety like CO13 on different dates and incidence of blast disease.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 18 and 21.7.1951. (iv) (a) 2 ploughings, lauder and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) CO-13 (early). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 65 32". (x) 15.10.1951 to 5.11.1951.

2. TREATMENTS:
Main-plot treatments:
2 levels of manuring: M0 = 0 and M1 = Manuring.
Sub-plot treatments:

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 30' x 94'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Straw, chaff, neck infected tillers. (iv) (a) 1950—1951. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Analysis appears to be done for sowing dates under manured and unmanured conditions separately as for R.B.D.

5. RESULTS:
Unmanured

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>800.0</td>
<td>24.54 lb./ac.</td>
</tr>
<tr>
<td>D2</td>
<td>710.8</td>
<td>26.35 lb./ac.</td>
</tr>
<tr>
<td>D3</td>
<td>545.4</td>
<td>25.74 lb./ac.</td>
</tr>
<tr>
<td>D4</td>
<td>437.0</td>
<td>24.09 lb./ac.</td>
</tr>
</tbody>
</table>

Manured

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>441.3 lb./ac.</td>
<td>24.35 lb./ac.</td>
</tr>
<tr>
<td>D2</td>
<td>525.3</td>
<td>26.28 lb./ac.</td>
</tr>
<tr>
<td>D3</td>
<td>345.4</td>
<td>24.98 lb./ac.</td>
</tr>
<tr>
<td>D4</td>
<td>254.3</td>
<td>24.09 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Paddy (Kharif).  
Ref.: C.R.R.I. 49(8).  
Type: ‘CV’.

Object: To study the effect of single and double transplanting of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A.  (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 30.6.1949/30.7.1949 and 29.8.1949. (iv) (a) 4 ploughings, ladderins and levelling. (b) Transplanted. (c) —. (d) 9’ × 9’. (e) As per treatments. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.00’. (x) 17.12.1949.

2. TREATMENTS:
   Main-plot treatments:
   3 varieties: \( V_1 \) = T-90 (early), \( V_2 \) = T-1242 (late) and \( V_3 \) = F.R. 43 (B) late.

   Sub-plot treatments:
   4 methods of sowing: \( T_1 = \) single transplanting 30 days old seedlings, \( T_2 = \) double transplanting 1st of 30 days old and 2nd of 60 days old seedlings and \( T_3 = \) double transplanting 1st (date N.A.) and 2nd of 30 days old seedlings.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) Sub-plot 15’ × 21’. (b) 13’ × 19’. (v) 1 row all round. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain weight. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1902 lb./ac.
   (ii) (a) 221.6 lb./ac.
   (b) 188.0 lb./ac.

   (iii) V and T effects are highly significant. Interaction is not significant.

   (iv) Av. yield of grain 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>2173</td>
<td>1679</td>
<td>2054</td>
<td>1475</td>
<td>1845</td>
</tr>
<tr>
<td>( V_2 )</td>
<td>2578</td>
<td>1897</td>
<td>2342</td>
<td>1826</td>
<td>2160</td>
</tr>
<tr>
<td>( V_3 )</td>
<td>2001</td>
<td>1472</td>
<td>1916</td>
<td>1419</td>
<td>1702</td>
</tr>
<tr>
<td>Mean</td>
<td>2251</td>
<td>1683</td>
<td>2104</td>
<td>1573</td>
<td>1902</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. \( V \) marginal means = 78.3 lb./ac.
2. \( T \) marginal means = 76.7 lb./ac.
3. \( T \) means at the same level of \( V \) = 132.9 lb./ac.
4. \( V \) means at the same level of \( T \) = 139.3 lb./ac.

---

Crop: Paddy (Kharif).  
Ref.: C.R.R.I. 59(4).  
Type: ‘CV’.

Object: To study the effect of single and double transplanting of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A.  (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) Transplanting on 10.7.1950, 11.8.1950 and 16.8.1950. (iv) (a) 4 ploughings, ladderins and levelling. (b) Transplanted. (c) —. (d) 9’ × 9’. (e) As per treatments. (v) Nil. (vi) As per treatments (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 64.47’. (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 varieties: \( V_1 \) = T-90 (late), \( V_2 \) = T-1242 (late).
Sub-plot treatments:
4 methods of sowing: \(T_1\) = single transplanting 30 days old seedlings, \(T_2\) = single transplanting 60 days old seedlings, \(T_3\) = double transplanting 1st of 30 days old and 2nd 60 days old seedlings and \(T_4\) = double transplanting 1st (date N.A.) and 2nd of 30 days old seedlings.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) \(15' \times 21'\). (b) \(13.5' \times 19.5'\). (v) 1 row all round the Plot. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1948–1950. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2382 lb./ac.
(ii) (a) 415.9 lb./ac.
(b) 149.8 lb./ac.
(iii) Only T effect is highly significant.
(iv) Av. yield of grain 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>Mean</th>
</tr>
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<tbody>
<tr>
<td>(V_1)</td>
<td>2779</td>
<td>2378</td>
<td>2603</td>
<td>1882</td>
<td>2410</td>
</tr>
<tr>
<td>(V_2)</td>
<td>2812</td>
<td>2033</td>
<td>2550</td>
<td>2020</td>
<td>2354</td>
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<tr>
<td>Mean</td>
<td>2795</td>
<td>2365</td>
<td>2576</td>
<td>1911</td>
<td>2382</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. \(V\) marginal means = 120.1 lb./ac.
2. \(T\) marginal means = 61.1 lb./ac.
3. \(T\) means at the same level of \(V\) = 116.5 lb./ac.
4. \(V\) means at the same level of \(T\) = 141.5 lb./ac.

Crop: Paddy (Kharif).
Ref: C.R.R.I. 49(13). Type: 'CV'.

Object: To find the suitable second crop variety and the optimum date of planting.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) As per treatments. (iv) (a) 4 ploughings, tassering and levelling. (b) Transplanted. (c) Nil. (d) \(6' \times 6'\). (e) 2 to 3. (f) Nil. (v) As per treatments. (vi) Irrigated. (vii) 2–3 intercultures with Japanese weeder and one hand weeding. (viii) 46.00'. (a) N.A.

2. TREATMENTS:
Main-plot treatments:
6 dates of planting: \(D_1=6.10.1949\), \(D_2=22.10.1949\), \(D_3=7.11.1949\), \(D_4=22.11.1949\), \(D_5=8.12.1949\) and \(D_6=24.12.1949\).

Sub-plot treatments:
6 varieties: \(V_1=\text{ASD} 1\), \(V_2=\text{DI} 4\), \(V_3=\text{PTB} 10\), \(V_4=\text{Ch} 45\), \(V_5=\text{Ch} 3\) and \(V_6=\text{CO} 13\).

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) \(9' \times 10'\). (b) \(8' \times 9'\). (v) 1 row all round. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) No. (b) and (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Results with 2 dates of planting are available. About others no information is available.
5. RESULTS:

(i) 901 lb./ac.
(ii) (a) 239.3 lb./ac.
(b) 201.9 lb./ac.
(iii) **D** effect is highly significant while **V** effect and interaction **DV** are 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>606</td>
<td>907</td>
<td>954</td>
<td>430</td>
<td>606</td>
<td>842</td>
</tr>
<tr>
<td>D₂</td>
<td>1054</td>
<td>1525</td>
<td>1054</td>
<td>1054</td>
<td>836</td>
<td>1078</td>
</tr>
<tr>
<td>Mean</td>
<td>850</td>
<td>907</td>
<td>1239</td>
<td>742</td>
<td>830</td>
<td>839</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 69.1 lb./ac.
2. V marginal means = 105.7 lb./ac.
3. V means at the same level of D = 142.8 lb./ac.
4. D means at the same level of V = 147.4 lb./ac.

**Crop:** Paddy (Kharif).  **Ref:** C.R.R.I. 48(3).  **Type:** ‘CV’.

Object:--To find the effect of different spacings on different varieties of Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Paddy.  (c) N.A.  (ii) (a) Clay loam.  (b) Refer item 11 on page 1.  (iii) V₁ on 24.6.1948 and V₂ on 25.6.1948/4, 9.6.1948.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanted.  (c) =.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 2 varieties: V₁ = T-812 (medium) and V₂ = T-1242 (late).
(2) 3 spacings: S₁ = 3' × 3', S₂ = 6' × 6' and S₃ = 9' × 9'.

3. DESIGN:

(i) 2 x 3 Fact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 6.  (iv) (a) 15' × 15'.  (b) 12' × 12'.  (v) 1.5' alround.  (vi) Yes.

4. GENERAL:

(i) Good.  (ii) Maximum attack of hispa in S₁ and in plots of closer spacings i.e. in order of S₃, S₂, S₁.  Attack of thrips just in reverse order.  (iii) Straw, height, tillers, ear-length and yield of grain.  (iv) (a) 1945 contd.  (b) No.  (c) N.A.  (v) (a), (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 2934 lb./ac.
(ii) 188.0 lb./ac.
(iii) **V** and **S** effects are highly significant while their interaction is not 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>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>2662</td>
<td>2783</td>
<td>2904</td>
<td>2783</td>
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<tr>
<td>V₂</td>
<td>2904</td>
<td>3206</td>
<td>3146</td>
<td>3085</td>
</tr>
<tr>
<td>Mean</td>
<td>2783</td>
<td>2995</td>
<td>3023</td>
<td>2934</td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 34.6 lb./ac.
S.E. of V marginal mean = 27.81 lb./ac.
S.E. of body of table = 48.17 lb./ac.
Crop: Paddy (Kharif).  

Object: To compare 6 varieties sown on five different dates both in broadcast and transplanted conditions.

1. BASAL CONDITIONS:

   (i) (a) Paddy. (b) Paddy. (c) Nil. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) As per treatments. (iv) (a) 4 ploughings, laddering and levelling. (b) As per treatments. (c) N.A. (d) N.A. (e) 2 to 3. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 54.47'. (x) N.A.

2. TREATMENTS:

   Main-plot treatments:
   2 methods of sowing: M1=Broadcast and M2=Transplanted.

   Sub-plot treatments:

   Sub-sub-plot treatments:
   6 varieties: V1=Ch 2, V2=Ch 45, V3=Ch 47, V4=PTB 10, V5=DI 4 and V6=CO.I3.

3. DESIGN:

   (i) Split-plot. (ii) 2 main-plots/block, 3 sub-plots/main-plot, 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 4, (iv) (a) 11.5'x9.5'. (b) 9.5'x7.5'. (v) N.A. (vi) N.A. (vii) Yes.

4. GENERAL:

   (i) Satisfactory. (ii) N.A. (iii) Straw, height, tiller count and grain yield. (iv) (a) N A. (b) N.A. (c) Nil. (v) (a), (b), N.A. (vii) and (vii) Nil.

5. RESULTS:

   (i) 2058 lb./ac.
   (ii) (a) 319.6 lb./ac. (b) 619.4 lb./ac. (c) S10.5 lb./ac.
   (iii) M and S effects, and interaction MV are highly significant. Interactions DxM and DxV are significant. Other effects are not 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>
<th>M1</th>
<th>M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>834</td>
<td>960</td>
<td>1596</td>
<td>2035</td>
<td>1519</td>
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<tr>
<td>D2</td>
<td>2034</td>
<td>2128</td>
<td>2132</td>
<td>2188</td>
<td>2222</td>
<td>2884</td>
<td>2510</td>
<td>1923</td>
<td>3097</td>
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<td>D3</td>
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<td>2460</td>
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<td>2215</td>
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<td>1996</td>
<td>1999</td>
<td>2341</td>
<td>2012</td>
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<td>1707</td>
<td>2408</td>
</tr>
<tr>
<td>M1</td>
<td>1184</td>
<td>1242</td>
<td>1613</td>
<td>2228</td>
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<td>2005</td>
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<td>2260</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

S.E. of the difference of two

1. M marginal means

2. D marginal means

3. V marginal means

4. D means at the same level of M

5. M means at the same level of D

6. V means at the same level of M=208.3 lb./ac.

7. M means at the same level of V=197.7 lb./ac.

8. V means at the same level of D=255.4 lb./ac.

9. D means at the same level of V=265.2 lb./ac.

Crop: Paddy (Kharif).  

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

1. BASAL CONDITIONS:

   (i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.6.1948/29.7.1948. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) N.A. (d) 2-3 seedlings per hill. (v) Basal manuring of 100 maunds of compost per acre was given to half the experimental plots. (vi) N.A. (vii) Irrigated. (viii) 2 to 3 intercultures with Japanese weeder and one hand weeding. (ix) 54.35'. (x) 5.7.12.1948.

Ref.: C.R.R.I. 59(14). Type: 'CV'.

Ref.: C.R.R.I. 48(9). Type: 'CM'.

Ref.: C.R.R.I. 50(14). Type: 'CM'.

Ref.: C.R.R.I. 28(9). Type: 'N.A.'
2. TREATMENTS:

Main-plot treatments:
2 applications of compost: \( C_0 = \text{No compost} \) and \( C_1 = \text{Compost} \).

Sub-plot treatments:
5 levels of \( N \) as A/S: \( N_0 = 0, N_1 = 20, N_2 = 40, N_3 = 60 \) and \( N_4 = 80 \) lb./ac.

Sub-sub-plot treatments:
2 toppings: \( T_0 = \text{No topping} \) and \( T_1 = \text{Topping} \).

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/block; 5 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) 124' × 60'.
(iii) 4. (iv) (a) 30' × 10', (b) 28' × 8'. (v) 1' around the plot. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Height measurements, no. of tillers, straw and grain yield. (iv) (a) 1948 – cond. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) \( 2349 \) lb./ac.
(ii) \( 635.7 \) lb./ac.
(iii) \( 518.3 \) lb./ac.
(iv) \( 368.9 \) lb./ac.

Effect of C, N, T, interaction \( N \times T \) and \( C \times T \times N \) are highly significant. Interactions \( C \times T \) and \( C \times N \) are not significant.

Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Level</th>
<th>Mean</th>
<th>( T_0 )</th>
<th>( T_1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( C_0 )</td>
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<td>( C_1 )</td>
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<td>( T_0 )</td>
<td>2708</td>
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<td>2244</td>
</tr>
<tr>
<td>( T_1 )</td>
<td>2636</td>
<td>2644</td>
<td>2499</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. C marginal means = 142.1 lb./ac.
2. \( N \) marginal means = 129.6 lb./ac.
3. \( T \) marginal means = 58.3 lb./ac.
4. \( N \) means at the same level of \( C \) = 219.2 lb./ac.
5. \( C \) means at the same level of \( N \) = 271.9 lb./ac.
6. \( T \) means at the same level of \( C \) = 116.7 lb./ac.
7. \( C \) means at the same level of \( T \) = 164.3 lb./ac.
8. \( T \) means at the same level of \( N \) = 184.4 lb./ac.
9. \( N \) means at the same level of \( C \) = 234.9 lb./ac.

Crop: Paddy (Kharij). Ref.: C.R.R.I. 53(7). Type: 'CM'.

Object: To study the effect of cultural and manurial practices on Paddy yield.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 16.8.1953/9, 11.7.1953 and 3.8.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 10' × 10'. (e) 2–3 seedlings per hole. (f) None. (g) 40 lb./ac. of \( P_2O_5 \). (h) T-1292 (late). (i) Irrigated. (ii) 2–3 intercultures with Japanese weeders and one hand weeding. (iii) 46.02'. (iv) 1948. 26, 27.12.1953.

2. TREATMENTS:

Main-plot treatments:
4 levels of \( N \): \( N_0 = 0, N_1 = 30, N_2 = 60 \) and \( N_3 = 90 \) lb./ac.

Sub-plot treatments:
4 cuttings: \( C_0 = 0, C_1 = 1, C_2 = 2 \) and \( C_3 = 3 \) cuttings.

Sub-sub-plot treatments:
3 methods of planting: \( M_0 \) = Single transplanting 30 days old seedlings. \( M_1 \) = Single transplanting 50 days old seedlings and \( M_2 \) = Double transplanting 1st of 30 days old seedlings and 2nd of 20 days old seedlings.
3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication; 4 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/445.5 ac. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 3475 lb./ac.
(ii) (a) 772.6 lb./ac.
(b) 586.4 lb./ac.
(c) 295.4 lb./ac.
(iii) C and M effects are highly significant. Others are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C₂</th>
<th>C₁</th>
<th>C₀</th>
<th>C₃</th>
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<th>M₁</th>
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<td>3604</td>
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<td>3325</td>
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<td>3552</td>
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<td>M₂</td>
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</tbody>
</table>

S.E. of difference of two
1. N marginal means -157.7 lb./ac. 6. M means at the same level of N = 104.4 lb./ac.
2. C marginal means -119.7 lb./ac. 7. N means at the same level of M = 179.3 lb./ac.
3. M marginal means -52.3 lb./ac. 8. M means at the same level of C = 104.4 lb./ac.
4. C means at the same level of N =239.4 lb./ac. 9. C means at the same level of M = 147.0 lb./ac.
5. N means at the same level of C =260.5 lb./ac.

Crop : Paddy (Kharif) Ref :- C.R.R.I. 53(11) Type :- 'CM'.

Object :- To test the merits of the various treatment combinations under Japanese method of paddy cultivation.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (d) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 24.6.1953/18, 19.7.1953. (iv) (a) 4 ploughings, ladderine and levelling. (b), (c) As per treatments. (d) 10'x10'. (e) As per treatments. (vi) Nil. (vii) T-141 (medium). (viii) Irrigated. (ix) As per treatments. (x) 46.02'. (x) 26 to 30.11.1953.

2. TREATMENTS:
All combinations of (1), (2), (3), (4), (5) and (6)
(1) 2 seed rates : P₁=Local method and P₂=Japanese method.
(2) 2 seed preparations : Q₁=Local method and Q₂=Japanese method.
(3) 2 no. of seedings/hole : R₁=Local method and R₂=Japanese method.
(4) 2 methods of transplanting : S₁=Local method and S₂=Japanese method.
(5) 2 field manuring : T₁=Local method and T₂=Japanese method.
(6) 2 interculturing and weeding : U₁=Local method and U₂=Japanese method.

3. DESIGN:
(i) 2º Conf. Fact. with PQR, PSU, RST, QTU, QRST, PQST, PRTU interactions confounded. (ii) (a) 8 plots/block; 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 60'x10'. (b) 55' 4"x13' 4". (v) 1 row around. (vi) Yes.
4. GENERAL:

(i) Satisfactory.  
(ii) N.A. Sprayed with pereox (1 oz. in 2 gallons of water).  
(iii) Straw, height, tillers and ear-length.  
(iv) (a) Yes; 1953—cont.  
(b) No.  
(c) N.A.  
(v) (a), (b) Nil.  
(vi) and (vii) Nil.  

5. RESULTS:

(i) 4025 lb/ac.  
(ii) 363.5 lb/ac.  
(iii) Main effect of T is highly significant, while main effects of U is significant. Other effects are not significant.  
(iv) Av. response in lb/ac.

<table>
<thead>
<tr>
<th>Response with</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
<th>T</th>
<th>U</th>
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</thead>
<tbody>
<tr>
<td>Mean response</td>
<td>−63.28</td>
<td>18.34</td>
<td>−26.10</td>
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<tr>
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<td>−</td>
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<td>P₂</td>
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<td>33.44</td>
<td>134.82</td>
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<td>—</td>
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<td>—</td>
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<td>82.82</td>
<td>98.44</td>
<td>−468.18</td>
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S.E. of mean response = 64.26 lb/ac.  
S.E. of differential response = 90.88 lb/ac.  

Crop: Paddy (Kharif).  
Ref: C.R R.I. 53(10).  
Type: 'CM'.

Object: To compare local and Japanese methods of cultivation.

1. BASAL CONDITIONS:

(i) (a) Nil.  
(b) Paddy.  
(c) N.A.  
(d) Clay loam.  
(e) Refer item 11 on page 1.  
(iii) 24.6.1953/22.7.1953.  
(iv) (a) 4 ploughings, ladderising and levelling.  
(b) Transplanted.  
(c) —.  
(d) 10" x 10", (e) 2-3 seedlings per hole.  
(f) Nil.  
(v) T-141 (medium).  
(vi) Irrigated.  
(vii) As per treatments.  
(viii) 46/02'.  
(ix) 7 to 9.12.1953.

2. TREATMENTS:

All combinations of (1), (2), (3) and (4):  
(1) 2 methods of nursery planting: A₁=Japanese and A₂=Local.  
(2) 2 methods of transplanting: T₁=Japanese and T₂=Local.  
(3) 2 methods of field manuring: M₁=Japanese and M₂=Local.  
(4) 2 methods of intercultivation: C₁=Japanese and C₂=Local.

3. DESIGN:

(i) 24 confounding with A x T x M x C interaction confounded.  
(ii) (a) 8 plots/block; 2 blocks/replication.  
(b) N.A.  
(iii) 2.  
(iv) (a) 60' x 15'.  
(b) 58' 4" x 13' 4".  
(v) 1 row all round.  
(vi) Yes.

4. GENERAL:

(i) Satisfactory.  
(ii) N.A.  
(iii) Height and ear-length measurements, no. of tillers, straw and grain yield.  
(iv) (a) 1953—N.A.  
(b) N.A.  
(c) N.A.  
(v) (a), (b) Nil.  
(vi) and (vii) Nil.
5. RESULTS:

(i) 4169 lb./ac.
(ii) 312.6 lb./ac.
(iii) M effect alone is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>A₁</th>
<th>A₂</th>
<th>Mean</th>
<th>M₁</th>
<th>M₂</th>
<th>C₁</th>
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<td>4169</td>
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<td>4149</td>
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<td>4189</td>
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<tr>
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<td>4381</td>
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<td>3868</td>
<td>3848</td>
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</tbody>
</table>

S.E. of any marginal mean = 78.15 lb./ac.
S.E. of body of any table = 110.52 lb./ac.

Crop: Paddy (Kharif). Ref: C.R.R.I. 49(6)' Type: 'CMV'.

Object: To determine the optimum spacing for planting various varieties of paddy of different dates of planting under manured and unmanured conditions.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 17.6.1949 and 12.7.1949 As per treatments. (iv) (a) 4 ploughings, ladderizing and levelling. (b) Transplanted. (c) --. (d) As per treatments. (e) 2 to 3. (f) Nil. (g) As per treatments. (h) Irrigated. (i) 2-3 intercultures with Japanese weeder and one hand weeding. (j) 46.00°. (x) N.A.

2. TREATMENTS:

3 strips in perpendicular direction to the above 3 manures: N₀=0, N₁=20 and N₂=40 lb./ac.
Sub-plot treatments (in each of the above)
All combinations of (1) and (2)
(1) 3 varieties: V₁=T·608 (early), V₂=T·1145 (medium) and V₃=T·1242 (late).
(2) 3 spacing: S₁=6"x6", S₂=12"x12" and S₃=18"x18".

3. DESIGN:

(i) Strip-comb-split plot. (ii) (a) 3 strips in one direction; 3 strips in perpendicular; 9 sub-plot/strip. (b) N.A. (iii) 2. (iv) (a) 12"x12". (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) N.A. (iii) Straw, height, tillers and ear-length. (iv) (a) Yes; 1947—contd. (b) No. (c) N.A. (v) (a), (b) Nil. (vi) Nil. (vii) S.E.'s presented as available.

5. RESULTS:

(i) 1458 lb./ac.
(ii) N.A.
(iii) Main effects of T, M and V are highly significant, S effect is significant while other effects are not significant.
Object:—To know the effect of spraying different fungicides in different doses on the incidence of blast disease and to estimate the loss caused by the disease.

1. BASAL CONDITIONS:
   (i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 15.7.1951/21.8.1951.
   (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanting. (c) —. (d) N.A. (e) 1 to 2. (v) Nil.
   (vi) CO·ll (medium). (vii) Irrigated. (viii) 2 band weeding. (ix) and (x) N.A.

2. TREATMENTS:
   2. Bordeaux mixture 2 : 3 : 50.
   3. Perenox, usual dose i.e. 1 oz in 2 gallons of water.
   4. Control.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 12. (iv) 12' x 40'. (b) 10' x 36'. (v) I' alround. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Pests : N.A. Disease : Blast disease was observed at the early stages of plant growth, but the incidence had gone down a little by 25.9.1951. (iii) Yield and incidence of blast. (iv) (a) 1950–1951, (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1170 lb./ac.
   (ii) 81.74 lb./ac.
   (iii) Treatment differences are highly significant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tr>
<tr>
<td>2</td>
<td>1235</td>
</tr>
<tr>
<td>3</td>
<td>1194</td>
</tr>
<tr>
<td>4</td>
<td>884</td>
</tr>
</tbody>
</table>

S.E. mean = 23.6 lb./ac.

Object :— To find out the efficacy of insecticide to control patchy diplosis.

1. BASAL CONDITIONS :
(i) (a) and (b) Paddy. (c) N.A. (ii) (a) Clay loamy soil. (b) Refer item 11 on page 1. (iii) 27.6.1951/18.8.1951. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 6’x6’. (e) 1. (f) N.A. (g) GE 24 (late). (h) Irrigated. (i) 2 — 3 intercultures with Japanese weeder and one hand weeding. (ka) and (k) N.A.

2. TREATMENTS :
1. Control.  5. Gammexane—P20 B.H.C.—0.3 oz.
2. Hexidole—950 B.H.C.—0.3 oz.  6. Hortex—WP 25 (Y-1 somen)—0.16 oz.

All insecticides are sprayed at 1% strength. Insecticides 2 to 7 in one gallon of water.

3. DESIGN :
(i) R.B.D. (ii) (a) 8. (b) 134’x64’. (iii) 4. (iv) (a) N.A. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Satisfactory. (ii) This experiment is meant for the control of pest population. (iii) Number of Grubs, pupae, parasitic cocoon and silver shoots. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 1915 lb./ac.  (ii) 294.4 lb./ac.  (iii) Treatment differences are not significant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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</tr>
<tr>
<td>2.</td>
<td>1894</td>
</tr>
<tr>
<td>3.</td>
<td>1815</td>
</tr>
<tr>
<td>4.</td>
<td>1835</td>
</tr>
</tbody>
</table>

S.E./mean = 147.2 lb./ac.


Object :— To estimate the loss in yield due to blast disease of Paddy and effect of spraying on incidence of blast.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 2.7.1952/24, 25.8.1952. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (f) Nil. (g) CO 13 (early), T-1145 (medium). (h) Irrigated. (i) 2 — 3 intercultures with Japanese weeder and one hand weeding. (j) 56.0% (k) T-1145 on 18.12.1952 and CO-131 on 18.11.1952.

2. TREATMENTS :
1. Controlling all infection by spraying throughout at weekly intervals.
2. Controlling leaf infection by spraying upto boot leaf stage.
3. Controlling neck infection by spraying after boot leaf stage.
4. Control (no spraying).

3. DESIGN :
(i) R.B.D. (ii) (a) 4 for each variety. (b) N.A. (iii) 12. (iv) (a) 10’x30’ (b) 10’x28.5’. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Satisfactory. (ii) The disease incidence is not much. (iii) Straw, infected healthy tillers and grain yield. (iv) (a) to (c) N.A. (v) (a), (b) Nil. (vi) Nil. (vii) Analysis was done separately for each variety.

5. RESULTS :

<table>
<thead>
<tr>
<th>Variety CO-13</th>
<th>Variety T-1145</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) 1600 lb./ac.</td>
<td>(i) 1672 lb./ac.</td>
</tr>
<tr>
<td>(ii) 162.1 lb./ac.</td>
<td>(ii) 215.1 lb./ac.</td>
</tr>
</tbody>
</table>

(iii) Treatment differences are not significant.
Crop: Paddy (Kharif).  

Object — To study the relative efficiency of various herbicides and to find out the better method of the two pre-sowing or post-sowing applications and interaction if any.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A.  
(ii) (a) Clay loam. (b) Refer item 11 on page 1.  
(iii) 19.6.1952.  
(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) Ch-47 (early).  
(vii) Irrigated. (viii) Weeding as per treatments. (ix) 56.03°.  
(x) 29, 30, 10.1952.

2. TREATMENTS:
All combinations of (1) and (2) + a control  
(1) Two times of application: T1=Pre-sowing and T2=Post-sowing.  
(2) 5 herbicides: D1=Chloroxone, D2=Phenoxylene, D3=2.4-D, T, D4=Dowicide 100 lb./ac. and D5=Hand weeding.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4.  
(iv) (a) 21'x5'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1951—contd. (b) No.  
(c) N.A. (v) Yes; (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 274 lb./ac.  
(ii) 75.1 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>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<td>4.</td>
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</tr>
<tr>
<td>S.E./mean</td>
<td>=46.7 lb./ac.</td>
<td>S.E./mean</td>
<td>=90.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).  

Ref: C.R.R.I. 53(12).  Type: 'D'.

Object: — To study the relative efficiency of various herbicides and to find out the better method of the two pre-sowing or post-sowing applications and interaction if any.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (i) (a) Clay loam. (b) Refer item 11 on page 1.  
(ii) 23.6.1953/18.7.1953.  
(iii) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 9'x6". (e) 2 to 3. (v) Nil. (vi) T-141 (medium).  
(vii) Irrigated. (viii) Weeding as per treatments. (ix) 46.02°.  
(x) 12.12.1953.
2. **TREATMENTS:**

1. Control.
2. Hand weeding.
3. Chloroxone.
4. Phenoxylene.
5. 2,4,5-T.
6. 300 lb./ac. of Calcium cyanamide.
7. Chloroxone applied 6 weeks after planting.
8. Phenoxylene applied 6 weeks after planting.
9. 2,4,5-T applied 6 weeks after planting.

3. **DESIGN:**

(i) R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) 30'x9.5'. (b) 28'x7.5'. (v) 1' alround. (vi) Yes.

4. **GENERAL:**

(i) Good. (ii) N.A. (iii) Straw, height, tiller, ear-length and grain yield. (iv) (a) 1951-52—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**

(i) 3796 lb./ac.
(ii) 244.56 lb./ac.

Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3646</td>
</tr>
<tr>
<td>2.</td>
<td>3843</td>
</tr>
<tr>
<td>3.</td>
<td>3753</td>
</tr>
<tr>
<td>4.</td>
<td>3789</td>
</tr>
<tr>
<td>5.</td>
<td>3833</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>122.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Paddy (*Kharij*).  Ref: C.R.R.I. 53(15). Type: 'D'.

Object: —To find the best suitable fungicide out of various commercial products for controlling blast.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 23.7.1953/29.8.1953. (iv) (a) 4 ploughings, Laddering and levelling. (b) Transplanted. (c) —. (d) 9"x6". (e) 2-3. (v) Nil. (vi) CO-13 (early). (vii) Irrigated. (viii) 2-3 intercultures with Japanese weeder and one hand weeding. (ix) 46.02'. (x) N.A.

2. **TREATMENTS:**

6 fungicides: F₀ = 0 control (no spraying), F₁ = Bordeaux mixture, F₂ = Fenex, F₃ = Coppesan, F₄ = Diathane and F₅ = Wetcol.

3. **DESIGN:**

(i) R.B.D. (ii) 9. (b) N.A. (iii) 8. (iv) (a) 29"x8'4". (b) 27"x5'8". (v) 2 rows alround. (vi) Yes.

4. **GENERAL:**

(i) Satisfactory. (ii) There was incidence of disease, spraying was done with above fungicides, as per treatments. (iii) Straw, height, tillers and ear-length. (iv) (a) No. (b) Nil. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**

(i) 661.0 lb./ac.
(ii) 120.6 lb./ac.

Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>F₀</td>
<td>478.6</td>
</tr>
<tr>
<td>F₁</td>
<td>719.7</td>
</tr>
<tr>
<td>F₂</td>
<td>704.1</td>
</tr>
<tr>
<td>F₃</td>
<td>831.9</td>
</tr>
<tr>
<td>F₄</td>
<td>584.0</td>
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<tr>
<td>F₅</td>
<td>647.5</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>60.3 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Paddy (Kharif),  Ref.: C.R.R.I. 52(10), Type: 'D'.

Object:—To study the relative efficiency of various herbicides and to find out the optimum dose and time of planting.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer Item 11 on page 1. (iii) 17.6.1952/19.7.1952.

(iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) N.A. (e) 2 to 3. (v) Nil. (vi) Ch-47 (early). (vii) Irrigated. (viii) N.A. (ix) 56.03°. (x) 23.24.10.1952.

2. TREATMENTS:

1. Control
2. Hand weeding.
3. T.C.A. at 100 lb./ac. (once)
4. Chloroxone 1 lb./ac. of acid (once)
5. Chloroxylen 1 lb./ac. of acid (twice)
6. Phenoxylene 1 gallon/ac. (once)
7. Phenoxylene 1 gallon/ac. (twice)
8. Phenoxylene 1 gallon/ac. (once)
9. Phenoxylene 1 gallon/ac. (once)
10. Phenoxylene 1 gallon/ac. (twice)
11. Phenoxylene 1 gallon/ac. (once)
12. Phenoxylene 1 gallon/ac. (twice)
13. 2, 4, 5-T 1 lb./ac. (once)
14. 2, 4, 5-T 2 lb./ac. (once)
15. 2, 4, 5-T 1 lb./ac. (twice)
16. 2, 4, 5-T 2 lb./ac. (twice)

3. DESIGN:

(i) R B D. (ii) (a; 16. (b) N.A. (iii) 4. (iv) (a) 15’X11’. (b) 13’X9’. (v) 1’ around. (vi) Yes.

4. GENERAL:

(i) Good. (ii) N.A. (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1951—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1931 lb./ac.
(ii) 156.4 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>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>850</td>
<td>9.</td>
<td>1236</td>
</tr>
<tr>
<td>2.</td>
<td>1044</td>
<td>10.</td>
<td>972</td>
</tr>
<tr>
<td>3.</td>
<td>924</td>
<td>11.</td>
<td>1187</td>
</tr>
<tr>
<td>4.</td>
<td>893</td>
<td>12.</td>
<td>1069</td>
</tr>
<tr>
<td>5.</td>
<td>960</td>
<td>13.</td>
<td>1006</td>
</tr>
<tr>
<td>6.</td>
<td>1191</td>
<td>14.</td>
<td>989</td>
</tr>
<tr>
<td>7.</td>
<td>1074</td>
<td>15.</td>
<td>999</td>
</tr>
<tr>
<td>8.</td>
<td>1024</td>
<td>16.</td>
<td>1069</td>
</tr>
</tbody>
</table>

S.E./mean = 78.2 lb./ac.
3. DESIGN:
(i) R.B.D. (ii) (a) 5 for each variety. (b) N.A. (iii) 8. (iv) (a) 29' x 9'9". (b) 26'9" x 7'3". (v) Two rows all round. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Leaf Infection appeared 60 days after spraying (iii) Straw, height, tillers, ear-length and grain yield. (iv) (a) 1925—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Variety T-1145</th>
<th>Variety CO-13</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) 256 lb./ac.</td>
<td>(i) 980 lb./ac.</td>
</tr>
<tr>
<td>(ii) 216.9 lb./ac.</td>
<td>(ii) 147.1 lb./ac.</td>
</tr>
<tr>
<td>(iii) Treatment differences are significant.</td>
<td>(iii) Treatment differences are significant.</td>
</tr>
<tr>
<td>(iv) Av. yield of grain in lb./ac.</td>
<td>(iv) Av. yield of grain in lb./ac.</td>
</tr>
<tr>
<td>Treatment</td>
<td>Av. yield</td>
</tr>
<tr>
<td>1.</td>
<td>2547</td>
</tr>
<tr>
<td>2.</td>
<td>2601</td>
</tr>
<tr>
<td>3.</td>
<td>2635</td>
</tr>
<tr>
<td>4.</td>
<td>2689</td>
</tr>
<tr>
<td>5.</td>
<td>2334</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-76.7 lb./ac.</td>
</tr>
</tbody>
</table>

| Mean | -18.50 | Mean | -31.54 |

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Angular values</th>
<th>Treatment</th>
<th>Angular values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>16.89 (.713)</td>
<td>1.</td>
<td>27.37 (21.90)</td>
</tr>
<tr>
<td>2.</td>
<td>21.21 (13.38)</td>
<td>2.</td>
<td>31.73 (28.32)</td>
</tr>
<tr>
<td>3.</td>
<td>19.26 (11.39)</td>
<td>3.</td>
<td>35.85 (34.95)</td>
</tr>
<tr>
<td>4.</td>
<td>15.67 (7.87)</td>
<td>4.</td>
<td>27.29 (25.19)</td>
</tr>
<tr>
<td>5.</td>
<td>21.48 (13.50)</td>
<td>5.</td>
<td>35.47 (32.67)</td>
</tr>
</tbody>
</table>

Object:—To find out the efficiency of dipping the seedlings in B.H.C. for controlling gall fly.

1. BASAL CONDITIONS:
(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loamy. (b) Refer item 11 on page 1. (iii) 25.6.1953/25, 26.7.1953. (iv) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 6' x 6'. (e) 1. (v) N.A. (vi) G.E.B. 24 (late). (vii) Irrigated. (viii) 2-3 weedings with Japanese weeder and one hand weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 nursery treatments: N₁ = Nursery not dusted, seedling not dipped and N₂ = Nursery dusted and seedling dipped.
(2) 5 pre-planting treatments: T₀ = Control, T₁ = Early dusted, T₂ = Late dusted, T₃ = Early and late dusted and T₄ = Regularly dusted.

3. DESIGN:
(i) 2 x 5 Fact in R.B.D. (ii) (a) 10. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 1/294.32 ac. for replications 1 to 4 and 1/282.9 ac. for replications 5 to 8. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Observations on pests were taken by sampling technique. Sample size of 1' x 1' were chosen and 6 samples were examined from each treatment. (iii) Population of insects at the peak period of incidence of gall fly. (iv) (a) N.A. (b) Nil. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 3111 lb./ac.
(ii) 202.2 lb./ac.
(iii) None of the effects is significant.

Crop :- Paddy (Kharij).
Ref :- C.R.R.I. 53(26) Type :- 'D'.

Mean infection percentage

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Angular values</th>
<th>Treatment</th>
<th>Angular values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>16.89 (.713)</td>
<td>1.</td>
<td>27.37 (21.90)</td>
</tr>
<tr>
<td>2.</td>
<td>21.21 (13.38)</td>
<td>2.</td>
<td>31.73 (28.32)</td>
</tr>
<tr>
<td>3.</td>
<td>19.26 (11.39)</td>
<td>3.</td>
<td>35.85 (34.95)</td>
</tr>
<tr>
<td>4.</td>
<td>15.67 (7.87)</td>
<td>4.</td>
<td>27.29 (25.19)</td>
</tr>
<tr>
<td>5.</td>
<td>21.48 (13.50)</td>
<td>5.</td>
<td>35.47 (32.67)</td>
</tr>
</tbody>
</table>

Mean

-18.50

-31.54
Object: To find out the efficiency of different insecticides in controlling the incidence of fall fly.

1. BASAL CONDITIONS:
   (i) (a) Paddy (b) Paddy, (c) N.A. (ii) (a) Clay loamy soil. (b) Refer item 11 on page 1. (iii) N.A. (iv) 2 ploughings, laddering and levelling. (b) Transplanting. (c) — . (d) 6' x 6'. (e) 1. (v) N.A. (vi) G.E.B. 24 (late). (vii) Irrigated. (viii) 7-3 intercultures with Japanese weeder and one hand weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   Main-plot treatments: 4 concentrations of sprayings and dusting: $M_1=0.1\%$ spraying, $M_2=0.2\%$ spraying, $M_3=5\%$ dusting and $M_4=10\%$ dusting.


3. DESIGN:
   (i) Split-pot. (ii) (a) 4 main-plots/blocks; 5 sub-plots/main-plot. (b) 134'x63'. (iii) 4. (iv) (a) N.A. (b) 24'x14'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Periodical observations are taken at weekly intervals for incidence of stem borers. (iii) Silver shoots, gurbs, pupae etc. (iv) (a) N.A. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1605 lb./ac.
   (ii) (a) 292.1 lb./ac.
   (b) 196.6 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

\[
\begin{array}{c|cccc|c}
   & M_1 & M_2 & M_3 & M_4 & \text{Mean} \\
\hline
D_0 & 1626 & 1522 & 1500 & 1470 & 1530 \\
D_1 & 1591 & 1583 & 1725 & 1728 & 1657 \\
D_2 & 1613 & 1495 & 1480 & 1717 & 1576 \\
D_3 & 1589 & 1491 & 1502 & 1659 & 1560 \\
D_4 & 1658 & 1883 & 1642 & 1626 & 1702 \\
\hline
\text{Mean} & 1615 & 1595 & 1570 & 1640 & 1605 \\
\end{array}
\]

S.E. of difference of two

1. M marginal means
2. D marginal means
3. D means at the same level of M
4. M means at the same level of D

\[
\begin{align*}
\text{S.E. of marginal mean of } & = 92.36\text{ lb./ac.} \\
\text{S.E. of marginal mean of } & = 69.55\text{ lb./ac.} \\
\text{S.E. of body of table} & = 139.1\text{ lb./ac.} \\
\text{S.E. of body of table} & = 154.9\text{ lb./ac.}
\end{align*}
\]
Crop: Paddy.  
Ref: C.R.R.I. 52(20).  
Type: 'D'.

Object: To determine the comparative efficacy of different insecticides (including an indigenous one) in controlling stem-borer.

1. BASAL CONDITIONS:

(i) (a) Paddy, (b) Paddy, (c) N.A. (ii) (a) Clay loam.  (b) Refer item 11 on page 1. (iii) 24.11.1952/10, 11.1.1953.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanting.  (c) —.  (d) 6"×6".  (e) 1.  (v) N.A.  (vi) MTU-15 (medium).  (vii) Irrigated.  (viii) 2-3 intercultures with Japanese weeders and one hand weeding.  (ix) N.A.  (x) 1, 2.5.1953.

2. TREATMENTS:

Main-plot treatments:

4 concentrations of sprays and dusts: M₁=0.1% spraying, M₂=0.2% spraying, M₃=5% dusting and M₄=10% dusting.

Sub-plot treatments:


3. DESIGN:

(i) Split-plot.  (ii) (a) 4 main-plots/replication and 5 sub-plots/main-plot.  (b) 132'×94'.

(v) N.A. (vi) Yes.

4. GENERAL:

(i) Suitable.  (ii) Periodical observations were taken for incidence of stem-borer and other pests.  (iii) Silver shoot, grubs, pupae etc.  (iv) (a) N.A.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 1307 lb./ac.

(ii) (a) 373.1 lb./ac.

(b) 251.9 lb./ac.

(iii) No effect is 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>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>1446</td>
<td>1283</td>
<td>1098</td>
<td>1421</td>
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<td>D₂</td>
<td>1441</td>
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<td>1436</td>
<td>1540</td>
<td>1386</td>
<td>1207</td>
<td>1392</td>
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<tr>
<td>D₄</td>
<td>1422</td>
<td>1395</td>
<td>1014</td>
<td>1345</td>
<td>1294</td>
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<td>1468</td>
<td>1569</td>
<td>1318</td>
<td>1512</td>
<td>1467</td>
</tr>
</tbody>
</table>

Mean 1443 1420 1238 1365 1367

S.E. of difference of two

1. M marginal means = 117.9 lb./ac.

2. D marginal means = 89.0 lb./ac.

3. D means at the same level of M = 178.0 lb./ac.

4. M means at the same level of D = 198.2 lb./ac.

Crop: Paddy (Kharij).  
Ref: C.R.R.I. 53(27).  
Type: 'D'.

Object: To find out the relative efficiency of different insecticides in controlling the incidence of gall fly.

1. BASAL CONDITIONS:

(i) (a) Paddy.  (b) Paddy.  (c) N.A.  (ii) (a) Clay loam.  (b) Refer item 11 on page 1. (iii) 25.6.1953/28, 30.7.1953.  (iv) (a) 4 ploughings, laddering and levelling.  (b) Transplanting.  (c) —.  (d) 6"×6".  (e) 1.  (f) N.A.  (vi) GSB-34 (late).  (vii) Irrigated.  (viii) 2-3 hand weedicings.  (ix) N.A.  (x) N.A.
2. TREATMENTS:

Main-plot treatments:
4 concentrations of sprays and dusting: M₁ = 0.1% spraying, M₂ = 0.2% spraying, M₃ = 5% and M₄ = 10% dusting.

Sub-plot treatments:

3. DESIGN:
(i) Split-plot. (ii) 4 main-plots/block; 5 sub-plots/main-plot. (b) 126' x 66'. (iii) 4. (iv) (a) 22' x 14'. (b) 21' x 13'. (v) 1 row around. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Incidence of pests is given in the table of spraying and dusting. These were taken at the time of emergence of broods. (iii) 4 samples in each sub-plot were examined for silver shoots, parasites, cocoons, grubs and pupae. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2070 lb./ac.
(ii) (a) 334.8 lb./ac.
(b) 263.8 lb./ac.
(iii) None of the effects is 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>
</tr>
</thead>
<tbody>
<tr>
<td>D₀</td>
<td>1998</td>
<td>2199</td>
<td>1806</td>
<td>1975</td>
<td>1995</td>
</tr>
<tr>
<td>D₁</td>
<td>2227</td>
<td>1894</td>
<td>2115</td>
<td>1908</td>
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<tr>
<td>D₂</td>
<td>1970</td>
<td>1809</td>
<td>2098</td>
<td>2050</td>
<td>1982</td>
</tr>
<tr>
<td>D₃</td>
<td>2046</td>
<td>2374</td>
<td>2060</td>
<td>2226</td>
<td>2177</td>
</tr>
<tr>
<td>D₄</td>
<td>2015</td>
<td>2160</td>
<td>2296</td>
<td>2182</td>
<td>2163</td>
</tr>
</tbody>
</table>

Mean 2051 2087 2075 2068 2070

S.E. of difference of two
1. M marginal means = 105.9 lb./ac.
2. D marginal means = 93.3 lb./ac.
3. D means at the same level of M = 186.5 lb./ac.
4. M means at the same level of D = 197.6 lb./ac.

Means % values for incidence of silver shoots (Figs. in brackets are the angular values)

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₀</td>
<td>39.07 (37.80)</td>
<td>38.43 (38.29)</td>
<td>43.82 (41.44)</td>
<td>45.00 (42.25)</td>
</tr>
<tr>
<td>D₁</td>
<td>37.87 (37.74)</td>
<td>39.61 (39.00)</td>
<td>38.08 (38.12)</td>
<td>37.00 (37.47)</td>
</tr>
<tr>
<td>D₂</td>
<td>41.79 (42.02)</td>
<td>40.46 (39.52)</td>
<td>43.13 (41.09)</td>
<td>38.36 (38.29)</td>
</tr>
<tr>
<td>D₃</td>
<td>42.09 (40.46)</td>
<td>42.54 (40.69)</td>
<td>34.75 (36.15)</td>
<td>34.09 (35.73)</td>
</tr>
<tr>
<td>D₄</td>
<td>45.80 (42.59)</td>
<td>41.33 (39.99)</td>
<td>38.24 (38.17)</td>
<td>36.63 (37.23)</td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharij). Ref.: C.R.R.I. 51(12). Type: 'DV'.

Object: To compare the yield of different varieties of Paddy treated with different solutions.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 30.6.51/3.8.51.
(iv) (a) 2 ploughings, laddering and levelling. (b) Transplanted. (c) (d) N.A. (e) 2 to 3. (f) Nil.
(vi) As per treatments. (vii) Irrigated. (viii) 2–3 intercultivations with Japanese weeder and one hand weeding. (ix) 65.32'. (x) 26.10.1951.
2. TREATMENTS:

Main-plot treatments:
7 varieties (early):
V₁ = PTB 10, V₂ = Ch 45, V₃ = Ch 47, V₄ = DCA 2, V₅ = DCA 12, V₆ = DCA 14 and V₇ = Benibhog.

Sub-plot treatments:
6 seeds treated with solutions: D₀ = Control, D₁ = Undiluted, D₂ = 1/10 dilution, D₃ = 1/100 dilution, D₄ = 1/1000 dilution and D₅ = 1/10000 dilution.

3. DESIGN:
(i) Split-plot. (ii) 7 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 6' x 16'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Straw, height, tiller, ear-length and grain yield. (iv) (a) 1949—contd. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 834.4 lb./ac.
(ii) (a) 329.0 lb./ac.
(b) 140.0 lb./ac.
(iii) Only V effect is significant.
(iv) Av. yield of grain in lbs. per acre.

<table>
<thead>
<tr>
<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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<tr>
<td>904.0</td>
<td>693.0</td>
<td>731.5</td>
<td>716.1</td>
<td>930.0</td>
<td>862.6</td>
<td>759.8</td>
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<tr>
<td>1037.5</td>
<td>623.9</td>
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<tr>
<td>1081.1</td>
<td>749.2</td>
<td>705.4</td>
<td>961.9</td>
<td>912.2</td>
<td>941.8</td>
<td>846.0</td>
</tr>
<tr>
<td>879.1</td>
<td>680.6</td>
<td>862.6</td>
<td>879.1</td>
<td>896.9</td>
<td>904.0</td>
<td>729.1</td>
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<td>934.7</td>
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<td>980.8</td>
<td>680.6</td>
<td>692.4</td>
<td>824.8</td>
<td>839.0</td>
<td>1006.8</td>
<td>789.3</td>
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</tbody>
</table>

Mean 962.4 684.8 749.0 840.2 912.3 906.4 785.0

S.E. of difference of two
1. V marginal means = 77.6 lb./ac.
2. D marginal means = 30.6 lb./ac.
3. D means at the same level of V = 80.8 lb./ac.
4. V means at the same level of D = 107.0 lb./ac.


Object: To find out the efficacy of insecticides to control stem borer.

1. BASAL CONDITIONS:
(i) (a) and (b) Paddy. (ii) 'N.A. (iii) (a) Clay loam. (b) Refer item 11 on page 1. (iv) 26.12.1950—30.11.1951. (v) (a) 4 ploughings, laddering and levelling. (b) Transplanted. (c) —. (d) 6' x 6'. (e) 1. (f) 1 ton/ac. of compost. (vii) As per treatments. (viii) 2 hand weedings and one weeding by means of Japanese rotary weeder. (ix) and (x) N.A.

2. TREATMENTS:

Main-plot treatments:
2 varieties: V₁ = DJ-4 and V₂ = PTB 10.

Sub-plot treatments:
5 insecticides: D₀ = Control, D₁ = Mechanical (collecting egg masses once in 4 days), D₂ = B.H.C. (P520) — 0.05 solution i.e. 1 oz. in one gallon of water, D₃ = D.D.T (G550) — 0.1% solution i.e. 1:50 gallon of water and D₄ = Hexyclan DP-50 i.e. 1:50 gallon of water.

3. DESIGN:
(i) Split-plot. (ii) 2 main-plots/replication and 5 sub-plots/main-plot. (b) 66' x 64'. (iii) 4. (iv) (a) N.A. (b) 30' x 12'. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Satisfactory. (ii) This experiment is meant to control the pests population in the field. (iii) Borer attacked in e.o. and chalk percentage. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) S.E. a) and S.E. (b) worked out with the help of C.D's given.

5. RESULTS:
(i) 587 lb./ac.
(ii) (a) 55.69 lb./ac.
(b) 78.92 lb./ac.
(iii) Only V effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D0</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
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<td>548</td>
<td>486</td>
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<tr>
<td>Mean</td>
<td>611</td>
<td>598</td>
<td>559</td>
<td>575</td>
<td>591</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. V marginal means = 17.42 lb./ac.
2. D marginal means = 39.46 lb./ac.
3. D means at the same level of V = 55.80 lb./ac.
4. V means at the same level of D = 52.86 lb./ac.

Crop: Paddy (Kharif). Ref: C.R.R.I. 50(22). Type: 'DM'.

Object: To study the effect of manorial pre-treatment of seed with various chemicals at three concentrations on the yield and quality of Paddy.

1. BASAL CONDITIONS:
(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 2 to 4.7.1950. (iv) (a) 4 ploughings, laddering and levelling. (b) Sown in puddled land. (c) -. (v) N.A. (vi) T-508 (medium). (vii) Irrigated. (viii) Weeding during 3rd to 10th and 16-17th August 1950. (ix) N.A. (x) 12 to 14.11.1950.

2. TREATMENTS:
Main-plot treatments:
2 doses of N: N_0 = 0 and N_1 = 20 lb./ac.

Sub-plot treatments:
3 concentrations: M_1 = 1M, M_2 = 1M and M_3 = 2M.

Sub-sub-plot treatments:
12 chemicals: C_0 = Control, C_1 = KH_2PO_4; C_2 = K_2HPO_4; C_3 = K_2PO_4; C_4 = NH_4H_2PO_4; C_5 = (NH_4)_3HPO_4; C_6 = NaH_2PO_4; C_7 = NH_4NO_3; C_8 = Urine soaked and C_9 = Water soaked.

3. DESIGN:
(i) Split-split-plot. (ii) (a) 2 main-plots/block; 3 sub-plots/main-plot; 12 sub-sub-plots/sub-plot. (b) 78'x54'. (iii) 4. (iv) (a) N.A. (b) 12'x41'. (v) N.A. (vi) Yes.

4. GENERAL:
5. RESULTS:

(i) 613 lb./ac.
(ii) (a), (b) N.A.
(c) 159.5 lb./ac.
(iii) C effect and interaction C×M are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
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<th>C6</th>
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<th>C9</th>
<th>C10</th>
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<td>620</td>
<td>825</td>
<td>755</td>
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<td>663</td>
<td>766</td>
<td>557</td>
<td>718</td>
<td>185</td>
<td>694</td>
<td>653</td>
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<tr>
<td>M2</td>
<td>571</td>
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<td>641</td>
<td>716</td>
<td>580</td>
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<td>250</td>
<td>681</td>
<td>575</td>
<td>652</td>
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</tr>
</tbody>
</table>

S.E. of difference of two C means = 46.05 lb./ac.
Other S.E.'s N.A.


Object :- To study the effect of manurial pre-treatment of seed with various chemicals at three concentrations on the yield and quality of Paddy.

1. BASAL CONDITIONS:

(i) (a) Paddy. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer item 11 on page 1. (iii) 1, 2, 7, 1949. (iv) (a) 4 ploughings, laddering and levelling. (b) Sown in puddled land. (c) (d) 9"x9". (e) 2 to 3. (v) Nil. (vi) T-608 (medium). (vii) Irrigated. (viii) Two weedings. (ix) N.A. (x) 8, 9, 11, 1949.

2. TREATMENTS:

Main-plot treatments:
2 levels of N as A/S: N0=0 and N1=20 lb./ac.

Sub-plot treatments:
3 concentrations of chemicals: M1=1 M, M2=1 M and M3=2 M.

Sub-sub-plot treatments:
11 chemicals: C0=Control, C1=KH2PO4, C2=K2HPO4, C3=KPO4, C4=NH4H2PO4, C5=NaH2PO4, C6=Na4HPO4, C7=(NH4)2 SO4, C8=NH4NO3, C9=Cowdung soaked and C10=Water soaked.

3. DESIGN:

(i) Split-split-split. (ii) (a) 2 main-plots/replication, 3 sub-plots/main-plot and 11 sub-sub-plots/sub-plot. (b) 9"x9"x83". (iii) 4. (iv) (a) 5'x3'x12'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) N.A. (iii) Straw, height of plant, tiller observations etc. (iv) (a) No. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 756 lb./ac.
(ii) (a) 551.6 lb./ac.
(b) 358.6 lb./ac.
(c) 102.7 lb./ac.
(iii) Only C effect is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></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>
<th>C₉</th>
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<td>M₃</td>
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<td>893</td>
<td>897</td>
<td>856</td>
<td>847</td>
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</table>

S.E. of difference of two
1. N marginal means = 67.9 lb./ac.
2. M marginal means = 43.5 lb./ac.
3. C marginal means = 29.6 lb./ac.
4. M means at the same level of N = 61.5 lb./ac.
5. N means at the same level of M = 84.5 lb./ac.
6. C means at the same level of N = 41.9 lb./ac.
7. N means at the same level of C = 78.8 lb./ac.
8. C means at the same level of M = 51.4 lb./ac.
9. M means at the same level of C = 65.5 lb./ac.
JUTE AGRICULTURAL RESEARCH INSTITUTE

BARRACKPORE
PROFORMA GIVING DETAILS OF EXPERIMENTAL STATION.


2. Tobis or Taluka. Barrackpore.

3. District. 24-Parganas.

4. Address. Director, Jute Agricultural Research Institute, Barrackpore, West Bengal.

5. Year of establishment. 1950 (Experiments started from 1952).

6. Distance from nearest railway station with the name of nearest railway station. 12 miles from Howrah Railway Station.

7. Programme of Research. Breeding and genetics, cytogenetics, anatomy, physiology, agronomy, agricultural chemistry, mycology and plant pathology and entomology, of jute, mesta and allied fibres.


9. Type of tract it represents. Alluvial.

10. General description of topography of the experimental area. More or less plain.

   (a) Broad soil types. New alluvial; sandy loam.
   (b) Depth. Five to six feet in depth (below 6 feet : mostly sand; rock not found).
   (c) Colour. Light grey.
   (d) Structure. Single grain.

   In a typical soil profile, just below the top 12" layer, there is deposition of loam clay soil of grey colour. The thickness of this layer is about 2 ft. The layers below this are of varying thickness of which some are sandy and some are loamy. Lime concentrations are also found at lower depths.

   (b) Chemical analysis if available with pH value.
   (c) Mechanical analysis (if available).

   (d) Available CaO—0.3 to 0.5%.
   (e) Available K2O—0.04 to 0.07%.
   (f) pH—6.7 to 7.2.


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<thead>
<tr>
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<td>0.62</td>
<td>0.40</td>
<td>1.45</td>
<td>3.29</td>
<td>52.23</td>
</tr>
</tbody>
</table>

13. Irrigation facilities available; year from which the facilities were made available. Proper irrigation is not yet not available. Irrigation of some areas done by portable pumps from the adjoining canal. 1952

14. Whether any proper drainage system exists. Yes.

15. Any other information regarding the farm. Latitude : 22°45', Longitude : 88°26' and Altitude : 30'.
Crop := Jute.  
Ref := J.A.R.I. 52(61).  
Type := 'C'.

Object := To compare the effect of line sowing with broadcasting.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jute. (c) Nil. (ii) (a) Light sandy loam. (b) Refer item 11 on page 99. (iii) 23.4.1952. (iv) (a) 5 ploughings and cross ploughing followed by laddering. (b) As per treatments. (c) N.A. (d) As per treatments. (e) —. (v) Compost at 3 ton/ac. at the time of general preparation of land. (vi) D=154 (capsularis, late). (vii) Unirrigated. (viii) Broadcasting—3 hand weedings. No thinning—3 to 4 wheel hoeings between lines. Spacing—1st hand weeding and thinning to proper spacing. 3 to 4 wheel hoeings between lines. (ix) 53.73' approximately. (x) 20.9.1952.

2. TREATMENTS:
   1. Broadcasting.
   2. No thinning x 12" spacing.
   3. 2"x12" spacing.
   4. 3"x12" spacing.
   5. 4"x12" spacing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 50'x16'. (b) 48'x14'. (v) 1' border around. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Stand, green weight and fibre weight. (iv) (a) 1948 to 1952. (b) No. (c) Nil. (v) (a) Carried out at Chinsurah from 1948—51. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2123 lb./ac.
   (ii) 156.8 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
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<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>2038</td>
</tr>
<tr>
<td>3.</td>
<td>2304</td>
</tr>
<tr>
<td>4.</td>
<td>2354</td>
</tr>
<tr>
<td>5.</td>
<td>2113</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>78.4 lb./ac.</td>
</tr>
</tbody>
</table>

Crop := Jute.  
Ref := J.A.R.I. 52(62).  
Type := 'C'.

Object := To compare the effect of line sowing with broadcasting.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jute. (c) Nil. (ii) (a) Light sandy loam. (b) Refer item 11 on page 99. (iii) 27.4.1952. (iv) (a) 5 ploughings and cross ploughing followed by laddering. (b) As per treatments. (c) N.A. (d) As per treatments. (e) —. (v) Compost at 3 ton/ac. at the time of general preparation of land. (vi) C.G. (chitravini, medium). (vii) Unirrigated. (viii) Broadcasting—3 hand weedings. No thinning—3 to 4 wheel hoeings. Spacing—1st hand weeding and thinning to requisite spacing. 3-4 wheel hoeings between lines. (ix) 53.73' approximately. (x) 15.9.1952.

2. TREATMENTS:
   1. Broadcasting.
   2. No thinning x 12" spacings.
   3. 2"x12" spacings.
   4. 3"x12" spacings.
   5. 4"x12" spacings.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 50'x16'. (b) 48'x14'. (v) 1' border around. (vi) Yes.
4. GENERAL:
(i) Good. (ii) N.A. (iii) Stand, green weight and fibre weight. (iv) (a) 1948 to 1952. (b) No. (c) Nil. (v) (a) Carried out from 1948 to 1951 at Chinsurah. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2413 lb/ac.
(ii) 137.8 lb/ac.
(iii) Treatment differences are significant.
(iv) Av. yield of fibre lbs/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
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<tr>
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<tr>
<td>3.</td>
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<tr>
<td>4.</td>
<td>2515</td>
</tr>
<tr>
<td>5.</td>
<td>2510</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-68.9 lb/ac</td>
</tr>
</tbody>
</table>

Crop :- Roselle.
Ref :- J.A.R.I. 52(68). Type :- ‘C’.
Object :- To study the effect of spacings and stages of harvest on the yield of fibre.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Jute. (c) N.A. (ii) (a) Sandy loam. (b) Ref item 11 on page 99. (iii) 29.4.1952. (iv) (a) 4 ploughings and laddering. (b) Broadcast etc. (c) 20 lb/ac for broadcast sowing and for others according to spacings. (d) As per treatments. (e) —. (f) Compost at 3 ton/ac applied at the time of general preparation of land. (vi) R.T. 1 (medium). (vii) Unirrigated. (viii) 3 weedings for broadcast sowing and thinning to requisite spacings for others. (ix) 67.75° approximately. (x) As per treatments.

2. TREATMENTS:
Main-plot treatments: 5 spacings: S1 = Broadcasting, S2 = No thinning x 12", S3 = 2" x 12", S4 = 6" x 12" and S5 = 5" x 12".
Sub-plot treatments: 3 harvesting stages: H1 = At bud (10.11.1952), H2 = At flowering (14.12.1952) and H3 = At pod (15.12.1952).

3. DESIGN:
(i) Split-plot. (ii) (a) 5 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) main-plot 32' x 17'; sub-plot N.A. (b) Sub-plot 10' x 15'. (v) 1' border around each plot. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) N.A. (iii) Stand count, green weight and fibre yield. (iv) (a) 1949—1953. (b) No. (c) Nil. (v) (a) Conducted at Chinsurah from 1949 to 1951. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1571 lb/ac.
(ii) (a) 223.6 lb/ac.
(b) 217.7 lb/ac.
(iii) None of the effects 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>S4</th>
<th>S5</th>
<th>Mean</th>
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<tr>
<td>H1</td>
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<td>1478</td>
<td>1588</td>
<td>1635</td>
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<td>1601</td>
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<tr>
<td>H2</td>
<td>1643</td>
<td>1548</td>
<td>1529</td>
<td>1493</td>
<td>1628</td>
<td>1568</td>
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<td>H3</td>
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<td>1510</td>
<td>1691</td>
<td>1455</td>
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<tr>
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<td>1598</td>
<td>1501</td>
<td>1542</td>
<td>1606</td>
<td>1607</td>
<td>1571</td>
</tr>
</tbody>
</table>
Crop: Roselle. Ref: J.A.R.I. 53(84). Type: 'C'.

Object: To study the effect of spacing and stages of harvest on the yield of fibre.

1. **Basal Conditions:**
   - (i) Nil. (b) Roselle. (c) Compost at 3 ton/ac. (d) Sandy soil. (e) Refer item 11 on page 59.
   - (ii) 9.5.1953. (iv) (a) 4 ploughings and laddering. (b) Broadcasting etc. (c) 20 lb/ac. for broadcast sowing and for others according to spacing. (d) As per treatments. (e) Nil.
   - (v) 3 weedings for broadcast sowing and 3 weedings and thinning to proper spacing for others. (ix) 55.28" approximately. (x) As per treatments.

2. **Treatments:**
   - **Main-plot treatments:**
     - 5 spacings: \( S_1 = \text{Broadcasting} \), \( S_2 = \text{No thinning} \times 12" \), \( S_3 = 2" \times 12" \), \( S_4 = 4" \times 12" \) and \( S_5 = 6" \times 12" \).
   - **Sub-plot treatments:**
     - 3 harvesting stages: \( H_1 = \text{At bud (9.11.1953)} \), \( H_2 = \text{At flowering (24.12.1952)} \) and \( H_3 = \text{At pod (15.12.1952)} \).

3. **Design:**
   - (i) Split-plot. (ii) (a) 5 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) main-plot 32" \times 17"; sub-plot N.A. (b) main-plot 30" \times 15"; sub-plot 10" \times 15". (v) 1' border around each main-plot. (vi) Yes.

4. **General:**
   - (i) Fair. (ii) N.A. (iii) Stand count, green weight and fibre yield. (iv) (a) 1949—1953. (b) No. (c) Nil. (v) (a) Conducted at Chinsurah during 1949-1951. (b) Nil. (vi) and (vii) Nil.

5. **Results:**
   - (i) 1816 lb./ac.
   - (ii) (a) 1831.1 lb./ac.
   - (b) 183.0 lb./ac.
   - (iii) None of the effects is significant.
   - (iv) Av. yield of fibre 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>( S_5 )</th>
<th>Mean</th>
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<tr>
<td>( H_1 )</td>
<td>1835</td>
<td>1743</td>
<td>1832</td>
<td>1761</td>
<td>1774</td>
<td>1769</td>
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<tr>
<td>( H_2 )</td>
<td>1941</td>
<td>1844</td>
<td>1905</td>
<td>1811</td>
<td>1563</td>
<td>1833</td>
</tr>
<tr>
<td>( H_3 )</td>
<td>2056</td>
<td>1681</td>
<td>1683</td>
<td>1861</td>
<td>1842</td>
<td>1825</td>
</tr>
<tr>
<td>Mean</td>
<td>1944</td>
<td>1756</td>
<td>1807</td>
<td>1811</td>
<td>1760</td>
<td>1816</td>
</tr>
</tbody>
</table>

S.E. of difference of two
- 1. S marginal means = 79.4 lb./ac.
- 2. H marginal means = 47.3 lb./ac.
- 3. H means at the same level of S = 105.6 lb./ac.
- 4. S means at the same level of H = 122.5 lb./ac.
Crop: Roselle.  
Ref: J.A.R.I. 53(81).  
Type: 'C'.

Object: To find out optimum date of sowing.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Roselle.  (c) Nil.  (ii) (a) Sandy loam.  (b) Refer item II on page 99.  (iii) As per treatments.  (iv) (a) 4-5 ploughings and harrowings.  (b) N.A.  (c) 15 lb./ac.  (d) 12'x9'.  (e) 2 seed/ hole at a depth of 3'.  (v) Compost at 3 ton/ac. broadcasted at the time of general preparation of land.  (vi) R.T. (medium).  (vii) Irrigated.  (viii) 3 weedings and wheel hoeing.  Thinning once to single plant/ point.  (ix) 55.28'.  (x) 3.12.1953.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D.  (ii) (a) 14.  (b) N.A.  (iii) 4.  (iv) (a) 11'x9'.  (b) 9'x7'.  (v) 1' border around each plot.  (vi) Yes.

4. GENERAL:
   (i) Fair.  (ii) N.A.  (iii) Stand, green weight and fibre weight.  (iv) (a) 1953 to 1955.  (b) No.  (c) Nil.  (v) (a) No.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 575 lb./ac.  (ii) 207.4 lb./ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of fibre in lb./ac.
   Treatment  Av. yield  Treatment  Av. yield  Treatment  Av. yield
   1.  1236  6.  642  11.  225
   2.  1130  7.  548  12.  99
   3.  1018  8.  608  13.  90
   4.  880  9.  451  14.  28
   5.  669  10.  436

S.E./mean =103.7 lb./ac.

---

Crop: Roselle.  
Ref: J.A.R.I. 51(35).  
Type: 'C'.

Object: To find the optimum seed rate.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Sandy loam.  (b) Refer item II on page 99.  (iii) 18.6.1951.  (iv) (a) 4 ploughings and laddering.  (b) N.A.  (c) As per treatments  (d) and (e) N.A.  (v) Compost at 3 ton/ac. at the time of general preparation of land.  (vi) R.T. 2 (medium).  (vii) Unirrigated.  (viii) Weeding thrice by hand.  (ix) 48.12'.  (x) 20.10.1951.

2. TREATMENTS:
   7 seed rates: R 1 =5, R 2 =10, R 3 =15, R 4 =20, R 5 =25, R 6 =30 and R 7 =35 lb./ac.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) N.A.  (iii) 5.  (iv) (a) 24'x15'.  (b) 22'x13'.  (v) 1' border around.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) N.A.  (iii) Stand, green weight and fibre weight.  (iv) (a) 1951 to 1953.  (b) No.  (c) Nil.  (v) (a) No.  (b) —.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1910 lb./ac.  
   (ii) 161.3 lb./ac.  
   (iii) Treatments are not significantly different.
(iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&lt;sub&gt;1&lt;/sub&gt;</td>
<td>1827</td>
<td>R&lt;sub&gt;4&lt;/sub&gt;</td>
<td>1889</td>
</tr>
<tr>
<td>R&lt;sub&gt;2&lt;/sub&gt;</td>
<td>2097</td>
<td>R&lt;sub&gt;4&lt;/sub&gt;</td>
<td>1779</td>
</tr>
<tr>
<td>R&lt;sub&gt;3&lt;/sub&gt;</td>
<td>1917</td>
<td>R&lt;sub&gt;7&lt;/sub&gt;</td>
<td>1758</td>
</tr>
<tr>
<td>R&lt;sub&gt;4&lt;/sub&gt;</td>
<td>2005</td>
<td>S.E./mean</td>
<td>72.1 lb./ac.</td>
</tr>
</tbody>
</table>

Object: To find out optimum seed rate.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) 28.4.1952.
(iv) (a) 4 ploughings and laddering. (b) Broadcasted. (c) As per treatments. (d) and (e) —. (v) Compost at 3 ton/ac. applied at the time of general preparation of land. (vi) R.T. 2 (medium). (vii) Unirrigated.
(viii) 3 hand weedicns. (ix) 53.82'. (x) 27.11.1952.

2. TREATMENTS:

8 seed rates: R<sub>1</sub> = 5, R<sub>2</sub> = 10, R<sub>3</sub> = 15, R<sub>4</sub> = 20, R<sub>5</sub> = 25, R<sub>6</sub> = 30, R<sub>7</sub> = 35 and R<sub>8</sub> = 40 lb./ac.

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 25' x 15' (b) 22' x 13'. (v) 1' border around (vi) Yes.

4. RESULTS:

(i) 2111 lb./ac.
(ii) 315.3 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&lt;sub&gt;1&lt;/sub&gt;</td>
<td>2429</td>
<td>R&lt;sub&gt;5&lt;/sub&gt;</td>
<td>2115</td>
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<tr>
<td>R&lt;sub&gt;2&lt;/sub&gt;</td>
<td>2463</td>
<td>R&lt;sub&gt;5&lt;/sub&gt;</td>
<td>1809</td>
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<tr>
<td>R&lt;sub&gt;3&lt;/sub&gt;</td>
<td>2316</td>
<td>R&lt;sub&gt;7&lt;/sub&gt;</td>
<td>1849</td>
</tr>
<tr>
<td>R&lt;sub&gt;4&lt;/sub&gt;</td>
<td>2169</td>
<td>R&lt;sub&gt;8&lt;/sub&gt;</td>
<td>1734</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 141.1 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Object: To find out optimum seed rate.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) 8.5.1953.
(iv) (a) 4 ploughings and laddering. (b) Broadcasted. (c) As per treatments. (d) and (e) —. (v) Compost at 3 ton/ac. applied at the time of general preparation of land. (vi) R.T. 2 (medium). (vii) Unirrigated.
(viii) Weeding thrice by hand. (ix) 53.82' approximately. (x) 27.11.1953.

2. TREATMENTS:

8 seed rates: R<sub>2</sub> = 5, R<sub>3</sub> = 10, R<sub>4</sub> = 15, R<sub>5</sub> = 20, R<sub>6</sub> = 25, R<sub>7</sub> = 30, R<sub>8</sub> = 35 and R<sub>9</sub> = 40 lb./ac.

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 24' x 15'. (b) 22' x 13'. (v) 1' border around. (vi) Yes.
4. GENERAL:
(i) Good. (ii) N.A. (iii) Stand, green weight and fibre weight. (iv) (a) 1951—1955. (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) 2163 lb./ac. (ii) 28.5 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<td>R₄</td>
<td>2182</td>
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<tr>
<td>R₂</td>
<td>2409</td>
<td>R₄</td>
<td>2144</td>
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<tr>
<td>R₃</td>
<td>2309</td>
<td>R₅</td>
<td>1850</td>
</tr>
<tr>
<td>R₄</td>
<td>2177</td>
<td>R₆</td>
<td>2010</td>
</tr>
</tbody>
</table>

S.E./mean = 127.8 lb./ac.

---

Crop: Mesta. Ref: J.A.R.I. 52(67). Type: 'C'.

Object: To find out optimum seed rate for Mesta.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Jute. (c) Nil. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) 27.4.1952. (iv) (a) 4 ploughings and ladderings. (b) Broadcast. (c) As per treatments. (d) and (e) nil. (f) Compost at 3 ton/ac. applied at the time of general preparation of land. (v) M.T. 15 (medium). (vi) Unirrigated. (vii) Weedings and mulching on 13.5.1952 and 2.6.1952. (viii) 49.46° (approximately). (x) Sept., 1952.

2. TREATMENTS:
8 seed rates: R₅=5, R₆=10, R₇=15, R₈=20, R₉=25, R₁₀=30, R₁₁=35 and R₁₂=40 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 14' x 10'. (b) 12' x 8'. (v) 1' border around each plot. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) Attacked with stem rot on 16.7.1952. Perenox sprayed once on 20.7.1952. (iii) Stand, green weight and fibre yield. (iv) (a) 1952 to 1955. (b) No. (c) Nil. (v) (a) No. (b) nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1269 lb./ac. (ii) 163.3 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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</tr>
<tr>
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<td>1277</td>
<td>R₅</td>
<td>1236</td>
</tr>
<tr>
<td>R₃</td>
<td>1426</td>
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</tr>
<tr>
<td>R₄</td>
<td>1244</td>
<td>R₇</td>
<td>1273</td>
</tr>
</tbody>
</table>

S.E./mean = 73.0 lb./ac.

---

Crop: Mesta (Kharif). Ref: J.A.R.I. 53(85). Type: 'C'.

Object: To find out optimum seed rate of Mesta.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Mesta. (c) Compost at 3 ton/ac. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) 16.6.1953. (iv) (a) 4 ploughings and ladderings. (b) Broadcast. (c) As per treatments. (d) and (e) nil. (f) Compost at 3 ton/ac. applied at the time of general preparation of land. (vi) M.T. 15 (medium). (vii) Unirrigated. (viii) Weedings and mulching twice (ix) 51.53° approximately. (x) 14.9.1953.
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) R (b) N.A. (iii) 5. (iv) (a) 14'x10'. (b) 12'x8'. (v) 1' border around. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) N.A. (iii) Stand count, green weight and fibre yield. (iv) (a) 1952 to 1953. (b) No. (c) Nil. (v) (a) No. (b) ~. (vi) and (vii) Nil.

5. RESULTS:

(i) 1268 lb./ac.
(ii) 192.4 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
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<td>R2</td>
<td>1503</td>
<td>R7</td>
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<tr>
<td>R3</td>
<td>1365</td>
<td>R8</td>
<td>1079</td>
</tr>
<tr>
<td>R4</td>
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<td></td>
<td>978</td>
</tr>
</tbody>
</table>

S.E./Mean = 86.0 lb./ac.

Crop :- Mesta.
Ref :- J.A.R.I. 53(80).
Type :- 'C'.

Object :- To find out optimum date of sowing.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Mesta. (c) N.A. (ii) (a) Sandy loam. (b) Refer item 11 on page 99. (iii) As per treatments. (iv) (a) 4-5 ploughings and harrowing. (b) and (c) N.A. (d) Plants 6" and rows 1' apart. (e) 2 seeds/hole at a depth of about 3". (f) Compost at 3 ton/ac. applied at the time of general preparation of land. (v) M.T. 15 (medium). (vi) Irrigated. (vii) 3 weedings and wheel hoeings. Thinning once to single plant/point. (ix) 51.53". (x) 1.9.1953 for treatments D1 to D6; 12.9.1953 for treatments D7 to D10.

2. TREATMENTS:


3. DESIGN:

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 11'x9'. (b) 9'x7' (v) 1' border around each plot. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Slight attack of stem-rot. N.A. (iii) Stand, green weight and fibre weight. (iv) 1535 to 1955. (b) No. (c) Nil. (v) (a) No. (b) ~. (vi) and (vii) Nil.

5. RESULTS:

(i) 1014 lb./ac.
(ii) 200.5 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of fibre in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
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<tr>
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<td>1434</td>
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<td>83</td>
</tr>
<tr>
<td>D5</td>
<td>1374</td>
<td>D10</td>
<td>55</td>
</tr>
</tbody>
</table>

S.E./Mean = 100.2 lb./ac.
CENTRAL TOBACCO RESEARCH INSTITUTE

RAJAHMUNDY
PROFORMA GIVING DETAILS OF EXPERIMENTAL STATION

I. Name of the experimental station.
   Central Tobacco Research Institute with a farm of about 117 acres.

2. Tehsil or Taluka.
   Rajahmundry.

3. District.
   East Godavary.

4. Address.
   Director, Central Tobacco Research Institute, Rajahmundry.

5. Year of establishment.
   1947.

6. Distance from nearest railway station with the name of nearest railway station.
   Godavary R.S. 1 mile from the Institute and 24 miles from the farm (Kateru).

7. Programme of research.
   This Institute is engaged in fundamental and applied research with special reference to F.C.V. tobacco.

8. Normal cropping pattern.
   Tobacco after tobacco.

9. Type of tract it represents.
   F.C.V. tobacco tract.

   The farm is situated at Kateru, 3 miles from Rajahmundry, towards the extreme end of the western side of Kateru village near Godavary bund. The farm is surrounded by F.C.V. tobacco fields.

    (a) Broad soil types.
        (i) Depth.
        Very deep. The rock is found at a depth of 30 to 52 feet.
        0–9"—Black
        9"–18"—Black
        15"–47"—Deep grey.
        47"–72"—Deep grey with light patches.
        72"–96"—Deep grey with grey patches.
        Angular blocky.

    (b) Chemical analysis if available.

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>pH</th>
<th>Organic Carbon</th>
<th>Organic Matter</th>
<th>Total N</th>
<th>Available P2O5</th>
<th>Total soluble salts</th>
<th>Chlorides</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–9&quot;</td>
<td>8.2</td>
<td>0.48</td>
<td>0.82</td>
<td>0.035</td>
<td>0.033</td>
<td>0.068</td>
<td>0.0012</td>
</tr>
<tr>
<td>9–18&quot;</td>
<td>7.5</td>
<td>0.44</td>
<td>0.75</td>
<td>0.029</td>
<td>0.038</td>
<td>0.057</td>
<td>0.0011</td>
</tr>
<tr>
<td>18–36&quot;</td>
<td>8.1</td>
<td>0.47</td>
<td>0.80</td>
<td>0.026</td>
<td>0.028</td>
<td>0.033</td>
<td>0.0013</td>
</tr>
<tr>
<td>36–54&quot;</td>
<td>8.2</td>
<td>0.49</td>
<td>0.84</td>
<td>0.028</td>
<td>0.031</td>
<td>0.067</td>
<td>0.0012</td>
</tr>
<tr>
<td>54–72&quot;</td>
<td>8.2</td>
<td>0.45</td>
<td>0.78</td>
<td>0.026</td>
<td>0.020</td>
<td>0.067</td>
<td>0.0026</td>
</tr>
<tr>
<td>72–96&quot;</td>
<td>8.3</td>
<td>0.42</td>
<td>0.73</td>
<td>0.021</td>
<td>0.022</td>
<td>0.078</td>
<td>0.0043</td>
</tr>
<tr>
<td>97–120&quot;</td>
<td>8.3</td>
<td>0.42</td>
<td>0.72</td>
<td>0.022</td>
<td>0.013</td>
<td>0.077</td>
<td>0.0036</td>
</tr>
</tbody>
</table>
(c) Mechanical analysis (if available).
(Indicate the % of various constituents analysed for)

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Coarse sand</th>
<th>Fine sand</th>
<th>Silt</th>
<th>Clay</th>
<th>CaCO₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>0—9&quot;</td>
<td>1.5</td>
<td>17.0</td>
<td>22.3</td>
<td>56.5</td>
<td>1.5</td>
</tr>
<tr>
<td>9—18&quot;</td>
<td>0.6</td>
<td>11.4</td>
<td>25.1</td>
<td>61.8</td>
<td>0.3</td>
</tr>
<tr>
<td>18—36&quot;</td>
<td>0.3</td>
<td>12.5</td>
<td>24.8</td>
<td>62.4</td>
<td>0.2</td>
</tr>
<tr>
<td>36—54&quot;</td>
<td>0.4</td>
<td>10.8</td>
<td>26.2</td>
<td>63.9</td>
<td>0.1</td>
</tr>
<tr>
<td>54—72&quot;</td>
<td>0.4</td>
<td>11.5</td>
<td>25.2</td>
<td>63.3</td>
<td>0.0</td>
</tr>
<tr>
<td>72—97&quot;</td>
<td>0.1</td>
<td>13.9</td>
<td>27.0</td>
<td>59.4</td>
<td>0.2</td>
</tr>
<tr>
<td>87—120&quot;</td>
<td>0.1</td>
<td>13.8</td>
<td>27.4</td>
<td>60.2</td>
<td>0.0</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Meteorological week</th>
<th>Month</th>
<th>Rainfall in mms. (Decennial average 1953—62)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23—26</td>
<td>June</td>
<td>162.68</td>
</tr>
<tr>
<td>27—30</td>
<td>July</td>
<td>203.56</td>
</tr>
<tr>
<td>31—35</td>
<td>August</td>
<td>195.34</td>
</tr>
<tr>
<td>36—39</td>
<td>September</td>
<td>157.02</td>
</tr>
<tr>
<td>40—44</td>
<td>October</td>
<td>222.56</td>
</tr>
<tr>
<td>45—48</td>
<td>November</td>
<td>14.49</td>
</tr>
<tr>
<td>49—52</td>
<td>December</td>
<td>4.77</td>
</tr>
<tr>
<td>1—5</td>
<td>January</td>
<td>9.34</td>
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<tr>
<td>6—9</td>
<td>February</td>
<td>15.45</td>
</tr>
<tr>
<td>10—13</td>
<td>March</td>
<td>10.15</td>
</tr>
<tr>
<td>14—17</td>
<td>April</td>
<td>12.15</td>
</tr>
<tr>
<td>18—22</td>
<td>May</td>
<td>79.88</td>
</tr>
</tbody>
</table>

13. Irrigation facilities available; year from which the facilities were made available. Yes, from 1960.

14. Whether any proper drainage system exists. Yes.

15. Any other information regarding the farm. Nil.
Crop :- Tobacco. Ref :- C.T.R.I. 48(3). Type :- 'M'.

Object :- To study the most suitable form in which 'N' can be applied to Tobacco.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item II on page 107. (iii) 8.11.1949. (iv) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33'x33'. 

2. TREATMENTS :
5 sources of N and a control : S1=A/S, S2=A/N, S3=Pot. Nit, and S4=G.N.C.
Different sources are applied on 24.10.1949 to give 20 lb./ac. of N.

3. DESIGN :
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 8. (iv) (a) 16'x381/2'. (b) 11'x33'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Normal. (ii) Nil. (iii) Green leaf and cured leaf yield. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) and (vii) N.A.

5. RESULTS :
(i) 508 lb./ac. (ii) 104.9 lb./ac. 
(iii) Treatments do not differ significantly.
(iv) Av. yield of cured leaf in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>424</td>
</tr>
<tr>
<td>S1</td>
<td>573</td>
</tr>
<tr>
<td>S2</td>
<td>522</td>
</tr>
<tr>
<td>S3</td>
<td>479</td>
</tr>
<tr>
<td>S4</td>
<td>546</td>
</tr>
<tr>
<td>S5</td>
<td>501</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>37.1 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Tobacco. Ref :- C.T.R.I. 50(4). Type :- 'M'.

Object :- To study the most suitable form in which 'N' can be applied.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item II on page 107. (iii) 3 replications on 18.11.1950 while other 5 on 20.11.1950. (iv) (a) 3-4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33'x33'. (e) One. (f) Nil. (g) N.A. (h) Nil. (i) Gaps filled on 26.11.1950. (x) N.A. (x) 5.2.1951, 19.2.1951, 28.2.1951 and 21.3.1951.

2. TREATMENTS :
4 sources of N and 2 controls : S1=A/S, S2=Amm. Phos. S3=Pot. Nit and S4=G.N.C.
Different sources applied on 14.11.1950 to give 20 lb./ac. of N.

3. DESIGN :
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 8. (iv) (a) 16'x381/2'. (b) 11'x33'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Good. (ii) Nil. (iii) Green leaf yield, etc. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 866 lb./ac. (ii) 132 lb./ac. 
(iii) Treatment differences are not significant.
Crop: Tobacco.  
Ref: C.T.R.I. 51(6). Type: 'M'.

Object: To compare the effect of different nitrogenous manures on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sorghum. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 26.10.1951. (iv) (a) 3-4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33" x 33". (e) 1. (v) Nil. (vi) Cigarette Tobacco. (vii) Nil. (viii) Gap filling, hand weeding and interculture with junior hoe. (ix) N.A. (x) 9.1.1952 to 25.2.1952.

2. TREATMENTS:
   5 sources of N and a control: $S_1=\text{Ammo. Phos.}$, $S_2=\text{A/S}$, $S_3=\text{A/N}$, $S_4=\text{Pot. Nit.}$ and $S_5=\text{G.N.C.}$
   Different sources broadcast 15 days prior to planting to give 20 lb./ac. of N.

3. DESIGN:
   (i) R.B.D. (ii) 6. (b) N.A. (iii) 5. (iv) (a) 22' x 49.5'. (b) 16.5' x 44'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Transplants established very well. Earlier growth was satisfactory. Subsequently the plants suffered badly. Development of leaf was poor. This was probably due to the previous crop of Sorghum. (ii) Nil. (iii) Green leaf yield and cured leaf yield. (iv) (a) 1949—1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 349.7 lb./ac.
   (ii) 51.24 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of cured leaf in lb./ac.
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>275.1</td>
</tr>
<tr>
<td>$S_1$</td>
<td>339.8</td>
</tr>
<tr>
<td>$S_2$</td>
<td>365.1</td>
</tr>
<tr>
<td>$S_3$</td>
<td>304.2</td>
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<tr>
<td>$S_4$</td>
<td>399.5</td>
</tr>
<tr>
<td>$S_5$</td>
<td>394.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=22.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Tobacco.  
Ref: C.T.R.I. 52(7). Type: 'M'.

Object: To find out the effect of green manuring with maize and application of F.Y.M. and their residual effect on the yield of Cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 29.10.1952. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33" x 33". (e) 1. (v) Nil. (vi) N.A. (vii) Pot watering on 1.11.1952. (viii) Gap filling and hand weeding. Intercultures with planter junior hoe. (ix) N.A. (x) 27.1.1953 to 26.3.1953.
2. TREATMENTS:
   Main-plot treatments:
   3 organic treatments: M₀=Fallow in Kharif 1952; M₁=Fallow in Kharif 1952 and F.Y.M. at 10 tons/ac. and M₂=Maize in Kharif 1952.
   Sub-plot treatments:
   2 levels of N: N₀=No manure and N₁=20 lb. N/ac. as A/S.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 1/40 ac. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Abnormal season of short rain fall with poor establishment of transplants. The crop improved later on.
   Fields very high but quality of leaf poor. (ii) Nil. (iii) Green weight, percentage of bright grades and stalk weight, etc. (iv) (a) 1952 and 1953. (b) No. (c) Nil. (v) (a), (b) N.A. (vi) Nil. (vii) Only 5 replications were taken into account for analysis. Experiment was laid out with 8 replications originally.

5. RESULTS:
   (i) 1186 lb/ac.
   (ii) (a) 153.7 lb/ac.
   (b) 146.7 lb/ac.
   (iii) None of the effects is significant.
   (iv) Av. wt. of cured leaf 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>1207</td>
<td>1146</td>
<td>1157</td>
<td>1173</td>
</tr>
<tr>
<td>N₁</td>
<td>1185</td>
<td>1257</td>
<td>1154</td>
<td>1199</td>
</tr>
<tr>
<td>Mean</td>
<td>1196</td>
<td>1201</td>
<td>1160</td>
<td>1186</td>
</tr>
</tbody>
</table>

   S.E. of difference of two
   1. M marginal means =68.73 lb/ac.
   2. N marginal means =53.57 lb/ac.
   3. N means at the same level of M =92.78 lb/ac.
   4. M means at the same level of N =95.62 lb/ac.

---


Object: To find out the residual effect of green manuring with maize and application of F.Y.M. on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33' x 33'. (e) 1. (v) Nil. (vi) N.A. (vii) Nil. (viii) N.A. (ix) 15.16'. (x) 13.2, 1954 and 17.2, 1954.

2. TREATMENTS:
   Main-plot treatments:
   3 organic treatments: M₀=Fallow in Kharif 1952; M₁=Fallow in Kharif 1952 and F.Y.M. at 10 tons/ac. and M₂=Maize in Kharif 1952.
   Sub-plot treatments:
   2 levels of N: N₀=No manure and 20 lb. N/ac. as A/S.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block; 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) N.A.  (ii) Nil.  (iii) Green leaf yield, cured leaf yield and percentage of bright grades.  (iv)  (a) 1952 to 1953.  (b) No.  (c) Nil.  (v) (a), (b) N.A.  (vi) Nil.  (vii) 6 replications in the original experiment. But flood made the site of the experiment heterogeneous. Hence only 2 replications in 1953-54 are taken for analysis.

5. RESULTS:
(i) 830.0 lb/ac.
(ii) (a) 66.12 lb/ac.  (b) 261.2 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>868</td>
<td>726</td>
<td>676</td>
<td>757</td>
</tr>
<tr>
<td>N1</td>
<td>664</td>
<td>1251</td>
<td>795</td>
<td>503</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means  = 46.75 lb/ac.
2. N marginal means  = 150.8 lb/ac.
3. N means at the same level of M  = 261.2 lb/ac.
4. M means at the same level of N  = 190.5 lb/ac.

Crop :- Tobacco.  Ref :- C.T.R.I. 52(8)  Type :- 'M'.

Object :- To find out whether C/N can replace A/S in manuring Cigarette Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) (a) Heavy black soil.  (b) Refer item 11 on page 107.  (iii) 12.11.1952.  (iv) (a) 3 to 4 ploughings with country plough.  (b) Transplanted.  (c) 5760 plants/ac.  (d) 33" x 33".  (e) 1.  (v) Nil.  (vi) Cigarette tobacco.  (vii) Nil.  (viii) Gaps filled on 23.11.1952, 13% interculture with junior hoe on 4.12.1952.  (ix) N.A.  (x) 9.2.1953 to 10.4.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of F.Y.M. as basal dressing : F0 = 0 and F1 = 3 ton/ac. of F.Y.M.
(2) 5 manurai doses : M0 = No manure, M1 = 20 lb/ac. of N as A/S, M2 = 40 lb/ac. of N as A/S, M3 = 20 lb/ac. of N as C/N and M4 = 40 lb/ac. of N as C/N.

3. DESIGN:
(i) 2 x 5 F.A.C. in R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 4.  (iv) (a) 1/40 ac.  (b) 1/60 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Due to peculiar seasonal condition the crop remained dark green with immature leaves and first picking did not cure well. Subsequent 2 pickings were uniform. Sun cured. The yield of green leaf only could be compared.  (ii) Nil.  (iii) Only green leaf.  (iv) (a) Not continued.  (b) and (c) --.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 8463 lb/ac.
(ii) 718.3 lb/ac.
(iii) None of the effects is significant.
Crop :- Tobacco.  
Ref: - C.T.R.I. 52(2).  
Type: - 'M'.

Object: - To study the effect of time of application of A/S and G.N.C.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Fallow in 1951.  (c) Nil.  (ii) (a) Heavy black soil.  (b) Refer item 11 on page 107.  (iii) 28.10.1953.  (iv) (a) 3 to 4 ploughings with country plough.  (b) Transplanted.  (c) 5760 plants/ac.  (d) 33x33".  (e) 1.  (f) M.C. at 3 tons/ac.  (g) N.A.  (h) Irrigated.  (i) Gap filling on 17.11.1952, 10% hand weeding on 2.12.1952 28.11.1952 and 10.12.1952.  (ix) N.A.  (x) 7.1.1953 to 6.3.1953.

2. TREATMENTS:

All combinations of (1), (2) and (3)+one control (no manure).

(1) 2 times of application: T1=Early mid. September on 27.9.1952 and T2=Late mid. October on 22.6.1952.

(2) 2 sources of N: S1=A/S and S2 as G.N.C.

(3) 2 levels of N: N1=20 lb./ac. of N and N2=40 lb./ac. of N.

3. DESIGN:

(i) R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 3.  (iv) (a) 1/48 ac.  (b) 1/69 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:

(i) Abnormal season of short rain face with poor establishment of transplants. The crop improved late : Fields were very high but quality of leaf poor.  (ii) Nil.  (iii) Green leaf yield, percentage of bright grades, etc.  (iv) (a) Not continued.  (b) and (c) Nil.  (v) (a) and (b) N.A.  (vi) Nil.  (vii) Experiment laid for 4 replications. Only 3 replications taken into account for analysis.

5. RESULTS:

(i) 983 lb./ac.

(ii) 113 0 lb./ac.

(iii) None of the effects is significant.

(iv) Av. yield of cured leaf in lb./ac.  
Control=950 lb./ac

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>Mean</th>
<th>T1</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>956</td>
<td>1126</td>
<td>1046</td>
<td>1043</td>
<td>1049</td>
</tr>
<tr>
<td>N2</td>
<td>998</td>
<td>948</td>
<td>973</td>
<td>1001</td>
<td>945</td>
</tr>
<tr>
<td>Mean</td>
<td>982</td>
<td>1037</td>
<td>1010</td>
<td>1022</td>
<td>997</td>
</tr>
<tr>
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</tr>
<tr>
<td>T2</td>
<td>1043</td>
<td>981</td>
<td></td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 64.2 lb./ac.

S.E. of body of any table or control mean = 62.4 lb./ac.
Crop :- Tobacco.  
Ref :- C.T.R.I. 52(9).  
Type :- 'M'.

Object :- To compare the effects of A/S, Pot. Nit. and A/S/N as sources of N on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 13.11.1952.
   (iv) (a) 3 ploughings with country plough. (b) Transplanted. (c) 5760 plants/acre. (d) 33'x33'. (e) One.
   (v) Nil. (vi) Cigarette Tobacco. (vii) Nil. (viii) Gap filling and interculture with junior hoe. (ix) N.A.
   (x) 10.2.1953 to 10.4.1953.

2. TREATMENTS:
   All combinations of (1) and (2)+ control (no manure)
   (1) 3 sources of N : S1=A/S, S2=Pot. Nitrate and S3=A/S/N.
   (2) 2 doses of N : N1=20 and N2=40 lb./acre.
   Manures applied on 8.11.1952.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 1/40 acre. (b) 1/60 acre. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later on. Yields very high but quality of leaf poor. (ii) Nil. (iii) Only green leaf yield. (iv) (a) Not contd. (b) ---. (c) ---. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 8017 lb./acre.
   (ii) 644.2 lb./acre.
   (iii) None of the effects is significant.
   (iv) Av. yield of green leaf in lb./acre.

<table>
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<th></th>
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<td>7933</td>
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<tr>
<td>S.E. of S marginal mean &amp;= 227.8 lb./acre.</td>
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<tr>
<td>S.E. of N marginal mean &amp;= 186.0 lb./acre.</td>
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<td>S.E. of body of table or control mean &amp;= 322.1 lb./acre.</td>
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Crop :- Tobacco.  
Type :- 'M'.

Object :- To compare the effect of A/S, C/N and A/S/N as sources of N on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 7.11.1953.
   (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/acre. (d) 33'x33'.
   (e) One. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Gap filling interculturing with the planter junior hoe and ploughing. (ix) 15.16'. (x) 23.1.1954 to 7.3.1954.

2. TREATMENTS:
   All combinations of (1) and (2)+ control (2 plots/block)
   (1) 3 sources of N : S1=A/S, S2=C/N and S3=A/S/N.
   (2) 2 doses of N : N1=20 and N2=40 lb./acre.
   Manures applied as top dressing on 4.11.1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 22'x38.5'. (b) 16.5'x33.0'. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Not satisfactory due to floods in August 1953. (ii) Nil. (iii) Yield of green leaf, cured leaf, percentage of bright grades and stalk weight. (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 5933 lb./ac.
(ii) 904.8 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 marginal mean of S or control = 261.2 lb./ac.
S.E. of marginal mean of N = 213.3 lb./ac.
S.E. of body of table = 369.4 lb./ac.

Crop :- Tobacco. Ref :- C.T.R.I. II(3). Type :- 'M'.

Object :- To find out the difference, if any, between broadcast application and placement of manure in furrows.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 26.10.1951 and 3.11.1951. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33" x 33". (e) I. (v) Nil. (vi) N.A. (vii) Nil. (viii) Gap filling and hand weeding. Planet junior cultivator worked. (ix) N.A. (x) 9, 20 and 31-1-1952.

2. TREATMENTS:
All combinations of (1), (2) and (3).
(1) 3 levels of N : N0=0, N1=20 and N2=40 lb./ac. of N.
(2) 3 sources of N : S1=A/S, S2=G.N.C. and S3=A/S+1/4 G.N.C.
(3) 2 methods of application of N : M1=Broadcast and M2=DYing.
Manures applied on 26.10.1951 and 3.11.1951.

3. DESIGN:
(i) 3 x 3 x 2 Fact. in R.B.D. (ii) 18. (b) N.A. (iii) 4. (iv) (a) 22' x 44'. (b) 16.5' x 38.5'. (v) N.A. (vi) Yes

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Green leaf yield, etc. (iv) (a) 1951 to 1952. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1047 lb./ac.
(ii) 142.1 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of cured leaf in lb./ac.

<table>
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Crop :- Tobacco.  
Ref :- C.T.R.I 52(4).  Type :- 'M'.
Object :- To find out the difference between broadcast application and placement of manures in furrows.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Tobacco.  (c) As per treatments.  (ii) (a) Heavy black soil. Refer item 11 on page 107.  (iii) 20.10.1952.  (iv) (a) 3 to 4 ploughings with country plough.  (b) Transplanted.  (c) 5760 plants/ac.  (d) 33'x33'.  (e) I.  (f) Nil. (g) N.A. (h) Nil.  (i) Nil.  (j) Gap filling, hand weeding and intercultures.  (k) N.A.  (l) 17.1.1953 to 21.3.1953.

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 sources of N : S1=A/S, S2=G.N.C. and S3=A/S+1/2 G.N.C.
(3) 2 methods of application of N : M1=Broadcast and M2=Drilling.
Manures applied on 6.10.1952.

3. DESIGN :
(i) 3X3X2 Fact. in R.B.D.  (ii) (a) 18. (b) N.A.  (iii) 4.  (iv) (a) 22'x44'. (b) 16.5'x38.5', (v) N.A.  (vi) Yes.

4. GENERAL :
(i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later. Yields very high but quality of leaf poor.  (ii) Nil.  (iii) Green leaf weight, percentage of bright grades etc.  (iv) (a) 1951 to 1952. (b) Yes.  (c) N.A.  (v) (a) and (b) N.A.  (vi) N.A.  (vii) Nil.

5. RESULTS :
(i) 876.1 lb./ac.  (ii) 132.1 lb./ac.  (iii) None of the effects is significant.  
(iv) Av. yield of cured leaf in lb./ac.

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<tr>
<th></th>
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S.E. of N or S marginal mean = -29.0 lb./ac. 
S.E. of M marginal mean = -23.7 lb./ac. 
S.E. of body of N X S table = -50.2 lb./ac. 
S.E. of body of M X S or M X N table = -41.1 lb./ac.
Crop: Tobacco


Object: - To find out whether the availability of manure to plants under local conditions is influenced by the application of Sulphur and Lime.

1. BASAL CONDITIONS:

   (i) (a) Nil. (b) Tobacco. (c) N.A.  (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 11.11.1952.
   (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) 7660 plants/ac. (d) 33’ x 33’.
   (e) 1. (v) M.C. at 3 ton/ac. broadcast before the onset of monsoon. (vi) N.A. (vii) Nil. (viii) 11% gap filling on 26.11.1952.

2. TREATMENTS:

   All combinations of (1), (2) and (3)
   (1) 2 levels of N as A/S: N₀ = 0 and N₁ = 20 lb./ac. of N.
   (2) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 50 lb./ac. of P₂O₅.
   (3) 3 manures: M₀ = Control, M₁ = ½ ton Sulphur and M₂ = ½ ton Lime.

   Manures applied on 5, 6.11.1952.

3. DESIGN:

   (i) 2 x 2 x 3 Fact. in R.B.D.
   (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 16.5’ x 33’. (b) 11’ x 27.5’. (v) N.A. (vi) Yes.

4. GENERAL:

   (i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later.
   Fields were very high but quality of leaf was poor. (ii) Nil. (iii) Green leaf and bright grades percentage.
   (iv) (a) 1952-1953. (b) Nil. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

   (i) 1257 lb./ac.
   (ii) 166.5 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of cured leaf in lb./ac.

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S.E. of N or P marginal mean = 33.59 lb./ac.
S.E. of M marginal mean = 41.60 lb./ac.
S.E. of body of M x N or M x P table = 58.87 lb./ac.
S.E. of body of N x P table = 47.79 lb./ac.

---

Crop: Tobacco


Object: - To find out whether the availability of manures to plants under local condition is influenced by application of Sulphur and Lime applied in the previous year.

1. BASAL CONDITIONS:

   (i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107
   (iii) 31.10.1953. (iv) (a) N.A. (b) Transplanted. (c) 5760 plants/ac. (d) 33’ x 33’.
   (ix) 15.16’. (x) 18.1.1954 to 28.2.1954.
2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 2 levels of N as A/S: N₀=0 and N₁=20 lb./ac. of N.
(2) 2 levels of P₀ as Super: P₀=0 and P₁=50 lb./ac. of P₀.
(3) 3 manures: M₀=Control, M₁=1 ton Sulphur and M₂=14 ton Lime.
Manures applied last year on 5.11.1952.

3. DESIGN:
(i) 2x2x3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 16.5'x13'. (b) 11'x27.5'. (v) N.A. (vi) Yes.

4. RESULTS:

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S.E. of marginal mean of N or P = 37.21 lb./ac.
S.E. of marginal mean of M = 45.60 lb./ac.
S.E. of body of M x N or M x P table = 64.45 lb./ac.
S.E. of body of P x N table = 52.21 lb./ac.

Crop: Tobacco. Ref: C.T.R.I. 1.0(1). Type: 'M'.

Object: To fix the optimum dose of P in relation to N and K manures.

1. BASAL CONDITIONS: 
(i) (a) Nil. (b) and (c) N.A. (ii) (a) Heavy black soil. (b) Refer item II on page 107. (iii) 11 and 12.11.1949. (iv) (a) 3 to 4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33'x33'. (e) 1. (f) M.C. (details N.A.). (vi) Flue cured tobacco. (vii) Nil. (viii) and (ix) N.A. (x) 19.1.1950 to 31.3.1950.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 5 levels of P₀ as Super: P₀=0, P₁=25, P₂=50, P₃=75 and P₄=100 lb./ac.
(2) 2 levels of N as A/S: N₀=0 and N₁=20 lb./ac. of N.
(3) 2 levels of K₀ as Pot. Sul.: K₀=0 and K₁=20 lb./ac. of K.
Fertilizers applied on 26.10.1949 just before heavy rains (on 27.10.1949).

3. DESIGN:
(i) 5x2² Conf. Fact. Confounding NK interaction. (ii) (a) 10 plots/block and 2 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 16'x16². (b) 11'x14'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) The general condition of the crop in all the plots was good. After first heavy rains, there was again 4" of rainfall and harvest was considerably delayed. (ii) Nil. (iii) Green leaf yield, percentage of bright grades. (iv) (a) 1949-1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 571 lb./ac.
(ii) 104.1 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of cured leaf in lb./ac.

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S.E. of N or K marginal means = 16.5 lb./ac.
S.E. of P marginal means = 26.0 lb./ac.
S.E. of body of $P \times N$ or $P \times K$ table = 36.8 lb./ac.
S.E. of body of $N \times K$ table = 23.3 lb./ac.


Object :—To find out the optimum dose of $P_2O_5$ to be applied to flue cured Tobacco.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 19.11.1950 and 20.11.1950. (iv) (a) 3 to 4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33'x33'. (e) 1. (f) Nil. (vi) Flue cured tobacco. (vii) Nil. (viii) Gaps filled. Interculture with country plough. (ix) N.A. (x) 29.1.1951 to 30.3.1951.

2. TREATMENTS:

All combinations of (1), (2) and (3)

(i) 5 levels of $P_2O_5$ as Super : $P_0$=0, $P_1$=25, $P_2$=50, $P_3$=75 and $P_4$=100 lb./ac.
(ii) 2 levels of $N$ at A/S : $N_0$=0 and $N_1$=20 lb./ac. of N.
(iii) 2 levels of $K_2O$ at Pot. Std. : $K_0$=0 and $K_1$=20 lb./ac. of $K_2O$.

Manures applied on 16.11.1950.

3. DESIGN:

(i) 5 x 2nd Confld. Fact. (NK is confld.) (ii) (a) 10 plots/block and 2 blocks/replication. (b) N.A. (iii) 4.
(iv) (a) N.A. (b) 11'x44'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. But only three replicates could be planted as the fourth replicate, which was planted on 20.11.1950 was green for a long time and was also poorer in growth than the rest. (ii) Incidence of powdery mildew caused some damage to the lower leaves. (iii) Green leaf yield. (iv) (a) 1949-1951. (b) No. (c) No. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment during 1951 'failed. Only 3 replications taken into account for analysis.

5. RESULTS:

(i) 767.7 lb./ac.
(ii) 107.7 lb./ac.
(iii) Only N effect is significant.
Crop: Tobacco.         Ref: C.T.R.I. 51(1). Type: 'M'.

Object: To find out the effect of N, P and K on yield and quality of Lanksa Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) N.A.  (c) N.A. (ii) (a) Heavy black soil.  (b) Refer item 11 on page 107, (iii) 27, 28.11.1951
   (iv) (a) 3 to 4 ploughings.  (b) Seedlings transplanted.  (c) 10890 plants/ac.  (d) 2'X2'.  (e) One.  (v) Nil.
   (vi) Lanksa Tobacco. (vii) Nil.  (viii) Gap filling.  (ix) N.A.   (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 5 levels of N : N0 =0, N1 =15, N2 =30, N3 =45 and N4 =60 lb./ac. of N.
   (2) 2 levels of P2O5 : P0 =0 and P1 =50 lb./ac. of P2O5.
   (3) 2 levels of K2O : K0 =0 and K1 =50 lb./ac. of K2O.

3. DESIGN:
   (i) 5 x 2 Confd. Fact., confounding PK interaction. (ii) (a) 10 plots/block ; 2 blocks/replication.  (b) N.A.
   (iii) 3.  (iv) (a) 10'x30'.  (b) 6'x26'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Normal.  (ii) Nil.  (iii) Green leaf yield etc. (iv) (a) No.  (b) -.  (c) Nil.  (v) (a) and (b) N.A.  (vi)
   and (vii) Nil.

5. RESULTS:
   (i) 1902 lb./ac.
   (ii) 762.0 lb./ac.
   (iii) Only PK interaction is significant. All other effects are not significant.
   (iv) Av. yield of cured leaf in lb./ac.

<table>
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<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
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S.E. of N or K marginal means = 17.0 lb./ac.
S.E. of P marginal means = 26.9 lb./ac.
S.E. of body of P x N or P x K table = 38.1 lb./ac.
S.E. of body of N x K table = 24.1 lb./ac.

Object:—To find out whether soil pH and availability of manures under local condition are influenced by the application of Sulphur.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco bulk in II and IV replications maize experiment in I and III replications. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item II on page 107. (iii) 4.11.1953. (iv) (a) N.A. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33'x33'. (e) 1. (v) Nil. (vi) Harrison special. (vii) Unirrigated. (viii) Gap filling hand weeding and interculture with planet junior hoe and plough. (ix) 15.10'. (x) 18.1.1954 to 27.2.1954.

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. of N.
   (2) 3 levels of P2O5 : P0 =0, P1 =50 lb./ac. (as Kudada phosphate) and P2 =50 lb./ac. as Super.
   (3) 2 levels of Sulphur : S0 =0 and S1 = 1 ton/ac.
   Manure applied as top dressing on 21.10.1953 in replications I and II and on 21.11.1953 in replications III and IV.

3. DESIGN:
   (i) 3 x 2 conf. Fact., Confounding NP and NPS interactions. (ii) (a) 6 plots/block ; 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 16.5'x44'. (b) 11.0'x38.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of green leaf, stalk, of curved leaf, percentage of bright grades. (iv) (a) 1953-1954. (b) —. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 7764 lb./ac.
   (ii) 898.2 lb./ac.
   (iii) Only N effect is significant.
   (iv) Av. yield of green leaf in lb./ac.

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S.E. of N or P marginal means = 183.3 lb./ac.
S.E. of S marginal means = 149.7 lb./ac.
S.E. of body of N x P table = 317.2 lb./ac.
S.E. of body of S x N or S x P table = 239.4 lb./ac.
Crop: Tobacco.  
Ref: C.T.R.I., 48(4).  Type: 'M'.

Object: To find out the dosage of important manures applied singly and in combination for Tobacco crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) No. (c) N.A.  (ii) (a) Heavy black soil.  (b) Refer item 11 on page 107.  (iii) 15.11.1943.  (iv) (a) N.A.  (b) Transplanted.  (c) 5760 plants/ac.  (d) 33°x33°.  (e) 1.  (v) N.A.  (vi) N.A.  (vii) Unirrigated.  (viii) Gap filling and hand weeding.  (ix) and (x) N.A.

2. TREATMENTS:
All combinations of (1), (2), (3), (4) and (5)
(1) 2 levels of F.Y.M.: P₀=0 and P₁=3 ton/ac.  
(2) 2 levels of Super: P₀=0 and P₁=300 lb./ac.  
(3) 2 levels of A/S: N₀=0 and N₁=100 lb./ac.

3. DESIGN:
(i) to (iii) 8x8 Quasi L. Sq.  (iv) (a) 22'x38.5'.  (b) 16.5'x33'.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) General growth was fair. After planting there was no rainfall and A/S which was applied late after transplanting could not produce any effect.  (ii) Nil.  (iii) Height of plant and tobacco yield.  (iv) (a) 1948 to 1951.  (b) Yes.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 684.4 lb./ac.
(ii) 57.87 lb./ac.
(iii) Only G effect is significant.
(iv) Av. yield of green leaf in lb./ac.

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<th></th>
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<th>G₁</th>
<th>N₀</th>
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<td>671.1</td>
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S.E. of any marginal mean = 10.23 lb./ac.
S.E. of body of any table = 14.47 lb./ac.

---

Crop: Tobacco.  
Ref: C.T.R.I., 48(5).  Type: 'M'.

Object: To find out the cumulative and residual effect of manures applied last year on the yield and quality of Tobacco.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco.  (c) As per treatments.  (ii) (a) Heavy black soil.  (b) Refer item 11 on page 107.  (iii) 23.10.1949/8, 9.11.1949.  (iv) (a) N.A.  (b) Transplanted.  (c) 5760 plants/ac.  (d) 33°x33°.  (e) 1.  (v) N.A.  (vi) N.A.  (vii) Nil.  (viii) to (a) N.A.
2. TREATMENTS:

All combinations of (1), (2), (3), (4) and (5)
(1) 2 levels of F.Y.M.: F₀=0 and F₁=3 ton./ac.
(2) 2 levels of G.N.C.: G₀=0 and G₁=300 lb./ac.
(3) 2 levels of A/S: N₀=0 and N₁=100 lb./ac.
(4) 2 levels of Super: P₀=0 and P₁=300 lb./ac.
(5) 2 levels of Pot. Sol.: K₀=0 and K₁=100 lb./ac.

Each treatment plot has been split up into four sub-plots viz.
1. 1 year application in 1948-49,
2. 2 years application in 1948-49 and 1949-1950,

Manures applied on 20.10.1949.

3. DESIGN:

(i) to (iii) 8x8 Quasi L. Sq. (iv) (a) 22'x38.5' (b) 11'x33' (v) N.A. (vi) Yes.

4. GENERAL:

(i) On account of heavy cyclonic rains in October soon after planting the whole field was under water and so the whole field had to be replanted. Plants established well. The late rains received by the end of February considerably affected the % of bright grades in all the treatments. (ii) Nil. (iii) Green leaf weight and percentage of bright grades. (iv) (a) 1948 to 1951. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 525.3 lb./ac.
(ii) 289.75 lb./ac.
(iii) Only N effect is significant.
(iv) Av. yield of green leaf in lb./ac.

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<th>N₀</th>
<th>N₁</th>
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S.E. of any marginal mean = 51.22 lb./ac.
S.E. of body of any table = 72.44 lb./ac.

Crop = Tobacco.

Ref = C.T.R.I. 50(6).

Object = To find out the cumulative and residual effect of manures applied last year on the yield and quality of Tobacco.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Tobacco. (c) As per treatments—applied in 1948. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 13.11.1950. (iv) (a) N.A. (b) Transplanted. (c) 5'60 plants/acre. (d) 33°x33'. (e) one. (v) Nil. (vi) N.A. (vii) Nil. (viii) Gap filling, etc. (ix) N.A. (x) N.A.
2. TREATMENTS:

All combinations of (1), (2), (3), (4) and (5)

(1) 2 level of P.Y.M.: F₀ =0 and F₁ =3 ton/ac.
(2) 2 levels of N as G.N.C.: G₀ =0 and G₁ =20 lb/ac.
(3) 2 levels of N as A/S: N₀ =0 and N₁ =20 lb/ac.
(4) 2 levels of P₂O₅ as Super: P₀ =0 and P₁ =50 lb/ac.
(5) 2 levels of K₂O: K₀ =0 and K₁ =50 lb/ac.

Each treatment plot has been split up into four sub plots viz. 1 = one year application in 1948-49, 2 = two years application in 1948-49 and 1950-1951, 2C = two years application in 1948-49 and 1949-1950, and 3C = three years application in 1948-49, 1949-50 and 1950-51.

3. DESIGN:

(i) to (iii) 8x8 Quasi L. Sq. (iv) (a) N.A. (b) 1/376 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (i) Nil. (iii) Tobacco yield. (iv) (a) 1948-1951; (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 692.4 lb/ac.
(ii) 180.6 lb/ac.
(iii) Main effects of G and N are significant.

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<th>N₀</th>
<th>N₁</th>
<th>P₀</th>
<th>P₁</th>
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S.E. of any marginal mean = 16.0 lb/ac.
S.E. of body of any table = 22.6 lb/ac.

Crop :- Tobacco.

Ref :- C.T.R.L S1(B).

Type :- 'M'.

Object — To find out the cumulative and residual effect of manures applied last year on the yield and quality of Tobacco.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Tobacco, (c) As per treatments—applied in 1948. (ii) (a) Heavy black soil. (b) Refer Item 11 on page 107. (iii) 22.10.1951. (iv) (a) N.A. (b) Transplanted. (c) 5760 plants/ac. (d) 3.3" x 3.3". (e) Oae. (v) Nil. (vi) N.A. (vii) N.A. (viii) gaps filling 2 hand weedicides and 2 intercultures. (ix) N.A. (x) 8, 12.1.1952 and 2, 18.2.1952.
2. TREATMENTS:

All combinations of (1), (2), (3), (4) and (5)
(1) 2 levels of F.Y.M.: \( P_0 = 0 \) and \( P_1 = 3 \) ton/ac.
(2) 2 levels of N as G.N.C.: \( G_0 = 0 \) and \( G_1 = 20 \) lb/ac.
(3) 2 levels of N as A/S: \( N_0 = 0 \) and \( N_1 = 2.0 \) lb/ac.
(4) 2 levels of \( P_2 \) as Super: \( P_0 = 0 \) and \( P_1 = 50 \) lb/ac.
(5) 2 levels of \( K_0 \): \( K_0 = 0 \) and \( K_1 = 50 \) lb/ac.

Each treatment plot has been split up into four sub plots viz. 1—one year application in 1948-49, 2—2 years application in 1948-49 and 1950-51, 3—2 years application in 1948-49 and 1949-50, and 3—3 years application in 1948-49, 1949-50 and 1950-51.

3. DESIGN:

(i) to (iii) 8 x 8 Quasi L. Sq. (iv) (a) N.A. (b) 22' x 38'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1948—1951. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 601.5 lb/ac.
(ii) 198.0 lb/ac.
(iii) Main effect of G alone is significant.
(iv) Av. yield of green leaf in lb/ac.

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<th>( N_0 )</th>
<th>( N_1 )</th>
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S.E. of any marginal mean = 17.5 lb/ac.
S.E. of body of any table = 24.7 lb/ac.

Crop :— Tobacco.  
Ref :— C.T.R.I. 48(2).  
Type :— "C".

Object:—To find out the relation between spacing and yield with respect to early and late planting and also to see if the manner of distribution of spacing around the plants was of any importance.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) N.A. (b) Transplanted. (c) and (d) As per treatments. (e) I. (v) Nil. (vi) Flue cured Tobacco. (vi) Nil. (vii) N.A. (ix) N.A. (x) N.A.
2. TREATMENTS:
All combinations of (1), (2) and (3)

(1) 4 spacings: $s_1=39'' \times 39''$ (4124 plants/ac.), $s_2=36'' \times 36''$ (4840 plants/ac.), $s_3=33'' \times 33''$ (5760 plants/ac.) and $s_4=30'' \times 29''$ (7210 plants/ac.).

(2) 4 designs of spacings: $C_1$=Square system, $C_2$=Equilateral system, $C_3$=2 : 1 ratio between and within rows and $C_4$=2 : 1 ratio between and within rows.

(3) 2 planting dates: $D_1$=22.10.1949 (early) and $D_2$=20.11.1949 (late).

3. DESIGN:
(i) to (iii) 8x8 Quasi L. Sq. (iv) (a) 33''x33''. (b) Different with different spacings as per treatments. (v) One row of border around except in case of equilateral system where two rows on one side and one row on the other side. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Final plant height and av. yield of cured leaf etc. (iv) (a) 1948—1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 721 lb./ac.
(ii) 152.1 lb./ac.
(iii) Effect due to D and interaction S x D are significant. No other effect is significant.
(iv) Av. yield of cured in lb./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>597</td>
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<td>687</td>
<td>846</td>
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<td>863</td>
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S.E. of marginal mean of $S$ or $C$ = 38.0 lb./ac.
S.E. of marginal mean of $D$ = 26.9 lb./ac.
S.E. of body of $D \times S$ or $D \times C$ table = 53.8 lb./ac.
S.E. of body of $S \times C$ table = 76.0 lb./ac.


Object:—To find out the relation between spacing and yield with respect to early and late plantings and also to see if the manner of distribution of space around the plants was of any importance.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sorghum. (c) N.A. (ii) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) N.A. (b) Transplanted. (c) and (d) As per treatments. (e) N.A. (v) 10 lb. of N as A/S. (vi) Cigarette Tobacco. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)

(1) 4 spacings: $s_1=39'' \times 39''$ (4124 plants/ac.), $s_2=36'' \times 36''$ (4840 plants/ac.), $s_3=33'' \times 33''$ (5760 plants/ac.) and $s_4=30'' \times 29''$ (7210 plants/ac.).

(2) 4 designs of spacings: $C_1$=Square system, $C_2$=Equilateral system, $C_3$=2 : 1 ratio between and within rows and $C_4$=2 : 1 ratio between and within rows.

(3) 2 planting dates: $D_1$=11.11.1949 (early) and $D_2$=20.11.1949 (late).
Crop - Tobacco.  
Ref - C.T.R.I. 50(2).  Type: 'C'.

Object: — To study the effect of spacing and systems of planting on yield in relation to the time of planting.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) N.A. (b) Transplanted. (c) and (d) As per treatments. (e) 1. (v) 15 lb./ac. of N as A/S and 6 C.L./ac. of F.Y.M. (vi) N.A. (vii) Nil. (viii) Gap filling and interculture with rotary junior hand hoe. (ix) N.A. (x) 31.1.1951 to 31.3.1951.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 4 spacings: $S_1=39'x39'$ (4124 plants/ac.), $S_2=36'x36'$ (4840 plants/ac.), $S_3=33'x33'$ (5761 plants/ac.) and $S_4=30'x29'$ (7210 plants/ac.).
   (2) 4 designs of spacings: $C_1=$Square system, $C_2=$Equilateral system, $C_3=3:2$ ratio between and within rows and $C_4=2:1$ ratio between and within rows.
   (3) 2 planting dates: $D_1=18.11.1950$ (early) and $D_2=1.12.1950$ (late).

3. DESIGN:
   (i) to (iii) $8x8$ Quasi L. Sq. (iv) (a) $41.1'x37.5'$. (b) Different with different spacings as per treatments. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Replanting of 1st planting had to be done due to heavy rains during 1st fortnight of November—growth below normal. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1948 to 1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) Raw data and results for the experiment conducted during 1951 N.A.
5. **RESULTS:**

(i) 441 lb/ac.

(ii) 68.6 lb/ac.

(iii) Only D effect is significant.

(iv) Av. yield of cured 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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<th>D₁</th>
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<td>445</td>
<td>458</td>
<td>425</td>
<td>441</td>
<td>513</td>
<td>369</td>
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</tbody>
</table>

**S.E. of marginal mean of S or C** = 17.15 lb/ac.

**S.E. of marginal mean of D** = 12.12 lb/ac.

**S.E. of body of S×D or C×D table** = 24.24 lb/ac.

**S.E. of body of S×C table** = 34.29 lb/ac.

---

**Crop:** Tobacco.  
**Ref:** C.T.R.I. 48(3).  
**Type:** 'C'.

**Object:** To find out the effect of planting seedlings of different ages and size (within the same age) on the quality and yield of Cigarette Tobacco.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (b) and (c) N.A.  
(ii) (a) Heavy black soil. (b) Refer item 11 on page 107.  
(iii) 18.10.1948.  
(iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) 5760 plants/ac. (d) 33”×33”. (e)

1. (v) N.A.  
(iii) Cigarette Tobacco.  
(vi) Nil.  
(viii) Gap filling and hand weeding.  
(ix) and (x) N.A.

2. **TREATMENTS:**

All combinations of (1) and (2)

(1) 3 ages of seedlings: A₁ = 9 weeks old, A₂ = 8 weeks old and A₃ = 7 weeks old.

(2) 2 sizes of seedlings: S₁ = Normal size (large) and S₂ = Small size.

3. **DESIGN:**

(i) Fact. in R.B.D.  
(ii) (a) 6. (b) N.A.  
(iii) 4.  
(iv) (a) 16’×49’. (b) 11’×44’. (v) N.A.  
(vi) Yes.

4. **GENERAL:**

(i) Poor establishment of seedlings particularly in plots with A₂. Damage was considerably high in two replications.  
(ii) Nutgram infestation.  
(iii) Final height of plants.  
(iv) (a) No. (b) and (c) Nil.  
(v) (a) and (b) N.A.  
(vi) and (vii) Nil.

5. **RESULTS:**

(i) 662 lb/ac.

(ii) 155.4 lb/ac.

(iii) None of the effects significant.

(iv) Av. yield of cured leaf in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
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<tbody>
<tr>
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<td>560</td>
<td>610</td>
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<td>A₂</td>
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<td>593</td>
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<tr>
<td>A₃</td>
<td>776</td>
<td>788</td>
<td>782</td>
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</table>

Mean | 688| 635| 662 |
Crop :- Tobacco.  
Ref. :- C.T.R.I. 49(6).  
Type :- ‘C’.

Object :- To find out how topping at different stages of the plant growth affect the yield and quality of the leaf along with the different plant spacings with a common row spacing.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 14.11.1949. 
   (iv) (a) 3-4 ploughings with country plough. (b) Transplanted. (c) and (d) As per treatments. (e) One. 

2. TREATMENTS:
   Main-plot treatments :
   4 spacings (plant to plant) : S₁ = 25.0”; (7603 plants/ac.), S₂ = 28.5’; (6669 plants/ac.), S₃ = 33.0”; (5760 plants/ac.) and S₄ = 39.3”; (4829 plants/ac.) with a common row spacing of 33”.
   Sub-plot treatments :
   5 stages of topping : T₀ = No topping, T₁ = Topping at bud stage, T₂ = Topping of the bud at emergence with few leaves, T₃ = Topping at the time of flowering and T₄ = Topping where 50% has taken place.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 33’×47”—11”; 33’×49”—10.5”; 33’×49”—6”; 31’×49”—1.33” for S₁, S₂, S₃ and S₄ respectively. (b) 27’×43”—9”; 27’×45”—11”; 27’×44”—0”; 27’×42”—6.9” for S₁, S₂, S₃ and S₄ respectively. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) On account of the late rains received during the last week of February 1950. Plants that were topped sucked profusely and the suckers could not be removed in time till the fields became accessible. This greatly vitiated the effect of topping on the yield. 
   (ii) Nil. 
   (iii) Green leaf yield etc. 
   (iv) (a) No. (b) —. (c) —. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 361.9 lb./ac. 
   (ii) (a) 139.7 lb./ac. (b) 81.5 lb./ac. 
   (iii) None of the effects is significant. 
   (iv) Av. yield of cured leaf in lb./ac.

<table>
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<td>362.9</td>
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<tr>
<td>Mean</td>
<td>392.7</td>
<td>351.6</td>
<td>372.7</td>
<td>330.5</td>
<td>361.9</td>
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</table>

S.E. of difference of two
2. T marginal means =-25.77 lb./ac. 
3. T means at the same level of S =-55.19 lb./ac. 
4. S means at the same level of T =-60.72 lb./ac.
Crop: Tobacco.  Ref: C.R.R.I. 53(5).  Type: 'C'.

Object: To find out the influence of direction of rows and population on the incidence of powdery mildew and yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) N.A.  (ii) (a) Heavy black soil. (b) Refer item 11 on page 107.  (iii) 19.20.11.1953.  (iv) (a) 3±4 ploughings with country plough.  (b) Transplanted.  (c) --. (d) As per treatments.  (e) One.  (v) Manure broadcast.  (vi) Chairman.  (vii) Unirrigated.  (viii) Gap filling and interculture first with plant junior hoe and then with plough.  (ix) 15.16°.  (x) 8.2.1953 to 20.3.1953.

2. TREATMENTS:
   Main-plot treatments:
   2 directions of planting: D₁ = East to West and D₂ = North to South.
   Sub-plot treatments:
   6 spacings: S₁ = 4' × 1.5', S₂ = 4' × 1.75', S₃ = 4' × 2', S₄ = 4' × 2.25' S₅ = 4' × 2.5' and S₆ = 2.75' × 2.75'.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block; 6 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 8° × 20'.  (b) 1/33 to 1/44 ac. according to spacing.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Not satisfactory.  (ii) Nil.  (iii) Green leaf yield, cured leaf yield, bright grades percentage and capsule weight.  (iv) (a) No.  (b) and (c) -.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 5896 lb./ac.
   (ii) (a) 1609.0 lb./ac.  (b) 624.0 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of green leaf in lb./ac.

<table>
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<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
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<td>5596</td>
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<td>5896</td>
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</table>

S.E. of difference of two
1. D marginal means = 464.5 lb./ac.
2. S marginal means = 312.0 lb./ac.
3. S means at the same level of D = 441.2 lb./ac.
4. D means at the same level of S = 614.8 lb./ac.

---

Crop: Tobacco.  Ref: C.T.R.I. 49(2).  Type: 'CM'.

Object: To provide information on the effect of different planting times in conjunction with N, P and K manuring on the yield and quality of crop and to find out the amount of dry matter removed from the soil during the various phases of plant growth at different planting times.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) N.A.  (c) N.A.  (ii) (a) Heavy black soil.  (b) Refer item 11 on page 107.  (iii) As per treatments.  (iv) (a) 3 to 4 ploughings with country plough.  (b) Seedlings transplanted.  (c) 5760 plants/ac.  (d) 33° × 33°.  (e) 1.  (v) Nil.  (vi) to (e) N.A.
2. TREATMENTS:
All combinations of (1), (2), (3) and (4)
(1) 4 planting dates: $D_1=13.10.1950$, $D_2=28.10.1950$, $D_3=12.11.1950$ and $D_4=27.11.1950$.
(2) 2 levels of $N$: $N_0=0$ and $N_1=20$ lb./ac.
(3) 2 levels of $P_2O_5$: $P_0=0$ and $P_1=50$ lb./ac.
(4) 2 levels of $K_2O$: $K_0=0$ and $K_1=50$ lb./ac.
Manure applied in deep furrows.

3. DESIGN:
(i) $4 \times 2^3$ Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 2. (one replication set apart for sampling studies and the other for growth and yield studies). (iv) (a) $57.1' \times 46.1'$. (b) $20' \times 17'$. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Due to cyclone October planting postponed. Manuring programme was upset. Only plots with 1st date of planting received manure. Growth sub-normal. Manure for other plots was given in November. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1949–1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Nil. (viii) Results available only in the fashion they are presented.

5. RESULTS:
(i) 388 lb./ac.
(ii) 101.3 lb./ac.
(iii) Only planting times are significantly different.

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<th>Treatment</th>
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</table>

S.E. of $D$ marginal mean $=25.32$ lb./ac.
S.E. of $N$, $P$ or $K$ marginal mean $=17.90$ lb./ac.

Crop: Tobacco.

Object: To study the optimum time of planting in relation to manuring and quality of leaf.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) Nil. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) $5760$ plants/ac. (d) $33' \times 33'$. (e) 1. (v) Nil. (vi) N.A. (vii) Nil. (viii) Gap filling. (ix) N.A. (x) 22.1.1951 to 31.3.1951.

2. TREATMENTS:
All combinations of (1), (2), (3) and (4)
(1) 4 planting dates: $D_1=13.10.1950$, $D_2=28.10.1950$, $D_3=12.11.1950$ and $D_4=27.11.1950$.
(2) 2 levels of $N$: $N_2=0$ and $N_3=20$ lb./ac.
(3) 2 levels of $P_2O_5$: $P_0=0$ and $P_3=50$ lb./ac.
(4) 2 levels of $K_2O$: $K_2=0$ and $K_3=50$ lb./ac.

3. DESIGN:
(i) $4 \times 2^3$ confd. Fact. (ii) (a) 8 plots/block and 4 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) $17' \times 41'$. (v) N.A. (vi) Yes.

4. GENERAL:
(i) The rains in second week of October resulted in a no. of gaps so that the first planting was almost similar to second planting in growth. (ii) Nil. (iii) Green leaf wt., etc. (iv) (a) 1949 to 1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 389 lb./ac.
(ii) 168.7 lb./ac.
(iii) None of the effects is significant.
Crop: Tobacco.
Ref.: C.R.R.I. 51(10).
Type: 'CM'.

Object: To find out the optimum date of transplanting of Cigarette Tobacco in relation to N, P and K requirements.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33'x33'. (e) One. (v) 10 toe/ac. of M.C. applied on 18.10.1951. (vi) Cigarette Tobacco. (vii) Nil. (viii) Gap filling interculture with plough in some plots and with plant junior cultivator in others. (ix) N.A. (x) 10.1.1952 to 4, 15.3.1952.

2. TREATMENTS:
Main-plot treatments: 4 dates of planting: $D_1 = 19.10.1951$, $D_2 = 1.11.1951$, $D_3 = 16.11.1951$ and $D_4 = 30.11.1951$.
Sub-plot treatments: All combinations of (1), (2) and (3)
1. 2 levels of N as A/S: $N_0 = 0$ and $N_1 = 20$ lb./ac.
2. 2 levels of $P_2O_5$ as single Super: $P_0 = 0$ and $P_1 = 50$ lb./ac.
3. 2 levels of $K_2O$ as Pot. Sui.: $K_0 = 0$ and $K_1 = 50$ lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication; 2 blocks/main-plot and 4 sub-plots/block in main-plot. (b) N.A. (iii) 3. (iv) (a) 22'x49.5'. (b) 16.5'x44'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Green leaf yield etc. (iv) (a) 1949-1951. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 943 lb./ac.
(ii) (a) 161.4 lb./ac.
(b) 85.4 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of cured leaf in lb/ac.

<table>
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S.E. of difference of two
1. marginal mean of \( D \) =46.59 lb/ac.
2. marginal mean of \( N, P \) or \( K \) =17.02 lb/ac.
3. \( N, P \) or \( K \) means at the same level of \( D \) =34.05 lb/ac.
4. \( D \) mean at the same level of \( N, P \) or \( K \) =52.44 lb/ac.
5. mean of \( N\times P, P\times K \) or \( N\times K \) table =24.07 lb/ac.

Crop : Tobacco.
Ref :- C.T.R.I. 51(5).
Type :- 'CM'.

Object :-To find out the effect of different levels of \( N \)/plant with different plant number/ac.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Tobacco. (c) N.A. (d) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 20.10.1951.
   (iv) (a) 3-4 ploughings with country plough. (b) Transplanted. (c) and (d) As per treatments. (c) One.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 4 levels of \( N \) as A/S: \( N₀ = 0 \), \( N₁ = 0.78 \), \( N₂ = 1.57 \) and \( N₃ = 2.35 \) gm/plant.
   (2) 6 levels of plant number/ac. and spacing: \( P₀ = 2872 \) and \( 36" \times 45" \), \( P₁ = 4840 \) and \( 36" \times 36" \), \( P₂ = 5808 \) and \( 36" \times 30" \), \( P₃ = 6776 \) and \( 35" \times 25" \), \( P₄ = 7744 \) and \( 36" \times 22" \) and \( P₅ = 8712 \) and \( 36" \times 20" \).
Manures applied just before planting.

3. DESIGN :
   (i) 4×6 Fact. in R.R.D. (ii) (a) 24. (b) N.A. (iii) 3, (iv) (a) \( 18" \times 30" \). (b) Varying from 1/128 to 1/138 as per treatments. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1951—1954. (b) No. (c) Nil. (v) (a) and (b) N.A.
   (vi) Nil. (vii) Only 3 replications taken into account for analysis. Experiment laid out with 4 replications.

5. RESULTS :
   (i) 1046 lb/ac.
   (ii) 149.9 lb/ac.
   (iii) None of the effects is significant.
(iv) Av. yield of cured leaf in lb./ac.

<table>
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S.E. of P marginal mean = 43.27 lb./ac.
S.E. of N marginal mean = 35.33 lb./ac.
S.E. of body of table = 86.55 lb./ac.

Crop: Tobacco, Ref: C.T.R.I. 52(3), Type: 'CM'.

Object: To find out the effect of different levels of N/plant with different plant number/ac.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 4.11.1952.
   (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) and (d) As per treatments. (e) 1.
   (v) M.C. at 3 ton/ac. applied just before planting. (vi) N.A. (vii) Nil. (viii) Gap filling, band weeding and interculture with plant junior hoe. (ix) N.A. (x) 17.1.1953 to 3.3.1953.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N as A/S: N₀=0, N₁=0.78, N₂=1.57 and N₃=2.35 gm./plant.
   (2) 6 levels of plant number/ac. and spacing: P₀=3872 and 36" x 45", P₁=4840 and 36" x 36", P₂=5808 and 36" x 30", P₃=6776 and 36" x 25", P₄=7744 and 36" x 22", and P₅=8712 and 36" x 20".

Manures applied on 29.10.1952.

3. DESIGN:
   (i) 4 x 6 Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) 1/81 ac. (b) 1/128 to 1/138 ac. (as per spacings). (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later. Field very high but quality of leaf poor. (ii) Nil. (iii) Green wt., percentage of bright grades, etc. (iv) (a) 1951 to 1954. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1256 lb./ac.
   (ii) 162.8 lb./ac.
   (iii) Only P effect is significant.
   (iv) Av. yield of cured leaf in lb./ac.

<table>
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<tr>
<th></th>
<th>P₀</th>
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<th>P₂</th>
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Crop:- Tobacco.  
Ref:- C.T.R.I. 53(3).  
Type:- 'CM'.

Object:--To find out the effect of different levels of N/plant with different plant number/ac.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) As per treatments.
   (ii) (a) Heavy black soil. (b) Refer item 11 on page 107.
   (iii) 11.11.1953. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) and (d) As per treatments.

2. TREATMENTS:
   All combinations of (I) and (2)
   (1) 4 levels of N as A/S: N₀=0, N₁=0.78, N₂=1.57 and N₃=2.35 gm/plant.
   (2) 6 levels of plant number/ac. and spacing : P₀=3872 and 36x45", P₁=4840 and 36x36", P₂=5808 and 36x30", P₃=6776 and 36x25", P₄=7744 and 36x22", and P₅=8712 and 36x20".

Manures applied as top dressing on 9.11.1953.

3. DESIGN:
   (i) 4x6 Fact. in R.B.D.  
   (ii) (a) 24. (b) N.A.  
   (iii) 4.  
   (iv) (a) 18’x30’. (b) 12’x26’ and 12’x28’, as per spacings. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Not satisfactory.  
   (ii) Nil.  
   (iii) Green leaf yield, cured leaf yield, bright grades percentage, mean stalk weight and capsule weight. (iv) (a) 1951 to 1954. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2747 lb./ac.
   (ii) 631 lb./ac.
   (iii) Only N effect is significant.
   (iv) Av. yield of green leaf in lb./ac.

<table>
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<th>P₀</th>
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Mean 2563 2318 2633 2961 3087 2722 2747

S.E. of P marginal mean =-158.2 lb./ac.
S.E. of N marginal mean =-159.2 lb./ac.
S.E. of body of table =-316.5 lb./ac.

Crop :- Tobacco.  
Ref:- C.T.R.I. 52(6).  
Type :- 'CM'.

Object:--To find out the residual effect of different levels of N per plant applied in the year 1951-52.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) As per treatments.  
   (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. 23, 24.10.1952.
   (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) and (d) As per treatments.  
2. TREATMENTS:

All combinations of (1) and (2)
(1) 4 levels of $N$ as $A/S$: $N_0=0, N_1=0.78, N_2=1.57$ and $N_3=2.35$ gm/plant.
(2) 6 levels of population/ac. and spacing: $P_0=3872$ and $36\times45'$, $P_1=4840$ and $36\times36'$, $P_2=5808$ and $36\times30'$, $P_3=6776$ and $36\times25\frac{1}{2}'$, $P_4=7744$ and $36\times22\frac{1}{2}'$ and $P_5=8712$ and $36\times20'$.

3. DESIGN:

(i) $4\times6$ Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) 1/81 ac. (b) 1/138 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later. Fields were very high but the quality of leaf was poor. (ii) Nil. (iii) Green weight mean stalk weight. (iv) (a) 1952—1953. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Direct effect of treatments studied vide experiment no C.T.R.I. 51(5).

5. RESULTS:

(i) 849 lb/ac.
(ii) 158.4 lb/ac.
(iii) None of the effects is significant.
(iv) Av. yield of cured leaf in lb/ac.

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S.E. of $N$ marginal mean = 32.33 lb/ac.
S.E. of $P$ marginal mean = 39.00 lb/ac.
S.E. of body of table = 79.20 lb/ac.

Crop:—Tobacco. Type:—‘CM’

Object:—To find out the residual effect of different levels of $N$/plant.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107.
(iii) N.A. (iv) (a) N.A. (b) Transplanted. (c) and (d) As per treatments. (e) One. (v) Nil. (vi) N.A.
(vii) Nil. (viii) N.A. (ix) 15.16'. (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)
(1) 4 levels of $N$ as $A/S$: $N_0=0, N_1=0.78, N_2=1.57$ and $N_3=2.35$ gm/plant.
(2) 6 levels of population/ac. and spacing: $P_0=3872$ and $36\times45'$, $P_1=4840$ and $36\times36'$, $P_2=5808$ and $36\times30'$, $P_3=6776$ and $36\times25\frac{1}{2}'$, $P_4=7744$ and $36\times22\frac{1}{2}'$ and $P_5=8712$ and $36\times20'$.

N as $A/S$ applied in 1952-53 residual effect studied this year.

3. DESIGN:

(i) $4\times6$ Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) 16.5'x33'. (b) 11'x27.5'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) Nil. (iii) Only green leaf yield. (iv) (a) 1952—1953. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 5214 lb./ac.
(ii) 976.3 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 N marginal mean = 199.3 lb./ac.
S.E. of P marginal mean = 244.1 lb./ac.
S.E. of body of table = 488.2 lb./ac.


Object: To find out the optimum requirements of nitrogen in relation to spacing and topping on the yield and quality of Tobacco.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Sorghum. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 31.10.1951 and 1.11.1951. (iv) (a) 3 to 4 ploughings with country plough. (b) Transplanted. (c) and (d) As per treatments. (e) 1. (vi) M.C. at 5 ton/ac. broadcast before the on-set of monsoon. (vii) Nil. (viii) Gap filling, hand weeding and interculture with planet junior hoe. (ix) N.A. (x) 9 and 12.1.1952 and 21.2.1952.

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 levels of spacing and no. of plants/ac.: S0=33"×24"=7690, S1=33"×28"=6730 and S2=33"×33"=5760.
(3) 3 levels of topping: T0=No topping, T1=Topping two weeks before first priming and T2=Topping a week before first priming.

3. DESIGN:

(i) 3^6 confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) S0: 22"×51.5", S1: 22"×51.7", and S2: 22"×52.6". (b) S0: 16.5"×51.5", S1: 16.5"×51.7" and S2: 16.5"×52.6". (v) N.A. (vi) Yes.

4. GENERAL:

(i) Early growth satisfactory but after a month the growth was stunted. It was probably due to the previous crop of sorghum. (ii) Nil. (iii) Green leaf yield. (iv) (a) 1951—1954. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 275 lb./ac.
(ii) 51 lb./ac.
(iii) Only levels of N and spacing effect is significant.
(iv) Av. yield or cured leaf in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>$S_1$</th>
<th>$S_2$</th>
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S.E. of any marginal mean = 10 lb./ac.
S.E. of any mean in the body of table = 17 lb./ac.

Crop: Tobacco.  
Ref: C.T.R.I. 52(5). Type: 'CM'.

Object: To find out the optimum requirements of spacing and topping for Cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) N.A. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 9/11.1952. (iv) (a) 3 to 4 ploughings with country plough. (b) Seedlings transplanted. (c) and (d) As per treatments. (e) 1. (v) M.C. at 5 C.L./ac. broadcasted before the onset of monsoon. (vi) Cigarette Tobacco. (vii) Nil. (viii) Gap filling and interculture with planet junior hoe. (ix) N.A. (x) 13.2.1953 to 28.3.1953.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of $N$ at $A/S$: $N_0=0$, $N_1=20$ and $N_2=40$ lb./ac.
   (2) 3 levels of spacing and no. of plants/ac.: $S_0=23'x24'=5690$, $S_1=23'x28'=6730$ and $S_2=23'x33'=7660$.
   (3) 3 levels of topping: $T_0$=No topping, $T_1$=Topping two weeks before first priming and $T_2$=Topping a week before 1st priming.

3. DESIGN:
   (i) 3 conf. Fact. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 1/40 ac. (b) 1/53 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Abnormal season of short rainfall with poor establishment of transplants. The crop improved later. Fields were very high but quality of leaf was poor. (ii) Nil. (iii) Percentage of bright grades. (iv) (a) 1951-1954. (b) Yes. (c) Nil. (v) Yes. (vi) Nil. (vii) For analysis, III replication has not been taken into account. Also the treatment topping has not been taken into account. The reasons are not given in the records without this treatment the total no. of replication for $S\times N$ will be 6).

5. RESULTS:
   (i) 1152 lb./ac.
   (ii) 157.4 lb./ac.
   (iii) Only levels of $N$ effect are significant.
Av. yield of cured leaf in lb./ac.

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<th>N₂</th>
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S.E. of any marginal mean = 37.1 lb./ac.
S.E. of mean in the body of tables = 64.26 lb./ac.


Object: To find out the optimum requirements of N spacing and topping for Cigarette Tobacco.

1. ASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) As per treatments. (ii) (a) Heavy black soil. (b) Refer item 11 on page 107.
   (iii) 13, 14, 15, 1953. (iv) (a) 3-4 ploughings with country plough. (b) Transplanting. (c) and (d) As per treatments. (e) One. (v) M.C. at 5 C.L./ac. (vi) Unirrigated. (vii) Unirrigated. (viii) Gap filling interculture with plant Junior hoe and plough. (ix) 15.16. (x) 29.1.1954, 14.2.1954, 1.3.1954 and 18.3.1954.

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 levels of spacing and no. of plants/ac.: S₀ = 33"x23! - 7690 - S₁ = 33"x28" - 6730 and S₂ = 33"x 33" - 5760.
   (3) 3 levels of topping: T₀ = No toppings, T₁ = Topping two weeks before first priming, and T₂ = Topping a week before first priming.

3. DESIGN:
   (i) 3² Conf. Fact. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 22'x51.5' (b) 16.5'x 51.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Not satisfactory due to floods in August 1953. (ii) Nil. (iii) Cured leaf yield, percentage of bright grades and weight per stalk. (iv) (a) 1951 - 1954. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 836.6 lb./ac.
   (ii) 120.0 lb./ac.
   (iii) N effect and interactions N x S, S x T are significant. Other effects are not significant.
   (iv) Av. yield of green leaf in lb./ac.

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<th></th>
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S.E. of any marginal mean of the table = 23.09 lb./ac.
S.E. of any mean in the body of the tables = 40.0 lb./ac.

Object: To provide information on the effect of planting time in conjunction with N manuring on the yield and quality of Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) Heavy black soil. (b) Refer item 11 on page 107. (iii) As per treatments. (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/acre. (d) 33’x33’. (e) One. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 2 levels of N as A/S: N0=0 and N1=20 lb./acre.
   (2) 2 levels of FYM: F0=0 and F1=3 ton/acre.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/repetition, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 22’x38’. (b) 15.5’x33’. (v) N.A. (vi) No.

4. GENERAL:
   (i) Immediately after the first planting there was rain and this caused a setback to first planting. Growth in the fourth planting was very poor and this was discarded. (ii) Nil. (iii) Plant height. (iv) (a) No. (b) Nil. (c) Nil. (d) (a) and (b) N.A. (vi) Nil. (vii) Only first 3 planting dates taken into account for analysis.

5. RESULTS:
   (i) 561 lb./acre.
   (ii) (a) 141.9 lb./acre.
   (b) 117.3 lb./acre.
   (iii) Only D effect is significant.
   (iv) Av. yield of cured leaf in lb./acre.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
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<td>677</td>
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<tr>
<td>F1</td>
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</table>

S.E. of difference of two
1. D marginal means =50.20 lb./acre.
2. F or N marginal means =33.86 lb./acre.
3. F or N means at the same level of D =58.65 lb./acre.
4. D means at the same level of F or N =65.01 lb./acre.
5. means in the body of FxN table =47.88 lb./acre.
Crop : Tobacco.  
Ref :- C.T.R.I. 50(5).  
Type :- 'IM'.

Object :- To study whether judicious application of artificial watering may help the crop together with 'N' manuring and topping.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tobacco. (c) N.A.  (ii) (a) Heavy black soil. (b) Refer item 11 on page 107. (iii) 15.11.1950.  
   (iv) (a) 3-4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33'x33'.  
   (e) One. (v) Nil.  (vi) N.A.  (vii) Nil.  (viii) Gap filling. (ix) N.A.  (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of watering: I0=No watering, I1=One watering a month after planting and I2=Two waterings second watering given 20 days after the 1st.  
   (2) 2 levels of N as A/S: N0=0 and N1=20 lb/ac. of N.  
   (3) 2 levels of topping: T0=No topping and T1=Topping.

3. DESIGN:
   (i) 3 x 2 x 2 Fact. in R.B.D.  (ii) (a) 12. (b) N.A.  (iii) 3.  (iv) (a) 22'x49.5'. (b) 16.5'x44.0'.  
   (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Normal.  (ii) Nil.  (iii) Green leaf yield and percentage of bright grades.  
   (iv) (a) 1950-1951. (b) N.A.  (c) N.A.  (v) Nil.  (vi) N.A.  (vii) Data analysed as R.B.D.

5. RESULTS:
   (i) 480.5 lb/ac.  
   (ii) 61.3 lb/ac.  
   (iii) Effects of I and T are significant. Interaction is not significant.  
   (iv) Av. yield of cured leaf in lb/ac.

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<tr>
<th></th>
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<th>I2</th>
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S.E. of N or T marginal mean = 14.45 lb/ac.  
S.E. of I marginal mean = 17.70 lb/ac.  
S.E. of body of I x N or I x T tables = 25.02 lb/ac.  
S.E. of body of N X T table = 20.43 lb/ac.

Crop : Tobacco.
Ref :- C.T.R.I. 51(7).  
Type :- 'M'.

Object :- To find out the effect of different levels of irrigation with and without N on the yield and quality of Cigarette Tobacco.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy in kharif. (c) N.A.  (ii) (a) Heavy black soil. (b) Refer item 11 on page 107.  
   (iii) 17.11.1951.  (iv) (a) 3 to 4 ploughings with country plough. (b) Seedlings transplanted. (c) 5760 plants/ac. (d) 33'x33'.  
2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 levels of irrigations: \( I_0 = \text{No irrigation}, \ I_1 = \text{One irrigation 30 days after transplanting}, \ I_2 = \text{One irrigation 50 days after transplanting} \) and \( I_3 = \text{Two irrigations—first as in} \ I_1 \text { and second as in} \ I_2. \)
(2) 2 levels of N as A/S: \( N_0 = 0 \text{ and} N_1 = 20 \text{ lb./ac. of N.} \)

3. DESIGN:
(i) \( 4 \times 2 \) Fact in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 22' \times 49.5'. (b) 16.5' \times 44'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Below normal. (ii) Nil. (iii) Green leaf yield, etc. (iv) (a) 1950—1951. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 679.0 lb./ac.
(ii) 99.84 lb./ac.
(iii) Only N effect is significant.
(iv) Av. yield of cured leaf in lb./ac.

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<tr>
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<th>( I_2 )</th>
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S.E. of marginal mean of N levels = 28.82 lb./ac.
S.E. of marginal mean of I levels = 40.76 lb./ac.
S.E. of means in the body of table = 57.64 lb./ac.
PROFORMA GIVING DETAILS OF EXPERIMENTAL STATION

1. Name of the experimental station.
   Indian Agricultural Research Institute.

2. Tehsil or Taluka.
   Delhi.

3. District.
   Delhi.

4. Address.
   Director, Indian Agricultural Research Institute, New Delhi-12.

5. Year of establishment.
   1905 at Pusa in Bihar State, shifted to its present site in Delhi in 1936.

6. Distance from nearest railway station with the name of nearest railway station.
   About 8 Kilometers west of New Delhi Railway Station.

Programme of research.
The primary functions of the Institute are to affect improvements in crop production through maintenance of soil fertility, fertilizer use and crop husbandry etc., evolve improved strains of some of the major food and industrial crops resistant to pests and diseases, conduct fundamental studies in breeding methodology, cytogenetics and crop physiology and impart training at post-graduate level in furthering research in the above subjects.

8. Normal cropping pattern.
   N.A.

9. Type of tract it represents.
   N.A.

    Morphological features of the profiles D₁ & D₂ based on the results of two profile samples from the farm belonging to the Division of Botany of the Institute.

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<th>Silt%</th>
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### Base Exchange Capacity and Exchangeable Bases

<table>
<thead>
<tr>
<th>Profile</th>
<th>Depth</th>
<th>b.e.c. mg/100 gms. of soil</th>
<th>Exchangeable base Mg/100 gms. of soil</th>
<th>Ca &amp; Na %</th>
<th>Ca/Na &amp; Na/K %</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
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<td>3'5&quot;-3'7&quot;</td>
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<td>.44</td>
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### Fusion Analysis of Clay

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<th>Depth</th>
<th>SiO₂ %</th>
<th>Fe₂O₃ %</th>
<th>Al₂O₃ %</th>
<th>Molecular Ratio SiO₂/Fe₂O₃/Al₂O₃</th>
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</thead>
<tbody>
<tr>
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<td>12.63</td>
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<td>2.22</td>
</tr>
</tbody>
</table>

12. Normal average rainfall in cm.
13. Irrigation facilities available; year from which the facilities were made available.
14. Whether any proper drainage system exists.
15. Any other information regarding the farm.

Crop: Paddy (Kharij). Ref: I.A.R.I. 51(45). Type: 'M'.

Object: To study the effect of different measures applied to Paddy nursery on the yield of paddy crop in unmanured plot.

1. BASAL CONDITIONS:
(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Kef 11 on page 143. (iii) 8.6.1951/13, 14.7.1951. (iv) (a) Ploughing with country plough, dressing with spade and ploughing with country plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hand weeding. (ix) 11.53'. (a) 29, 30.10.1951.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2)
(1) 4 levels of N: N₀ =0, N₁=100, N₂=200 and N₃=400 lb./ac. of N.
(2) 3 levels of P₂O₅ as Super: P₀ =0, P₁=80 and P₂=160 lb./ac. of P₂O₅.
Sub-plot treatments:

3. DESIGN:
(i) Split-plot. (ii) (a) 12 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/52 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1945-1951. (b) N.A. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1182 lb./ac.
(ii) (a) 474.2 lb./ac.
(b) 252.7 lb./ac.
(iii) S effect alone is significant and others are not significant.
(iv) Ave. 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>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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<td>1053</td>
<td>1170</td>
<td>1086</td>
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<tr>
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<td>1301</td>
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<td>1237</td>
<td>1128</td>
<td>1284</td>
<td>1300</td>
</tr>
<tr>
<td>P₂</td>
<td>1391</td>
<td>1154</td>
<td>1128</td>
<td>1240</td>
<td>1206</td>
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<td>1229</td>
<td>1198</td>
<td>1182</td>
<td>1088</td>
<td>1237</td>
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<td>1042</td>
<td>1167</td>
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<td>1275</td>
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</tbody>
</table>

S.E. of difference of two
1. N marginal means = 111.8 lb./ac.
2. P marginal means = 96.8 lb./ac.
3. S marginal means = 51.6 lb./ac.
4. S means at the same level of N = 103.2 lb./ac.
5. N means at the same level of S = 140.0 lb./ac.
6. S means at the same level of P = 89.3 lb./ac.
7. P means at the same level of S = 121.2 lb./ac.
8. means of the body of N X P table = 153.6 lb./ac.
Crop := Paddy (Kharij)  
Ref := I.A.R.I. 51 (44).  
Type := 'M'.

Object := To study the effect on soil fertility by growing Wheat after Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy-Wheat.  
   (b) Paddy.  
   (c) N.A.  
   (ii) (a) and (b) Refer item 11 on page 143.  
   (iii) 20, 21.7.1951.  
   (iv) (a) to (e) N.A.  
   (v) N.A.  
   (vi) Irrigated.  
   (vii) Weeding.  
   (ix) N.A.  
   (x) 31.10.1951.

2. TREATMENTS:
   All combinations (1), (2) and (3)
   (1) 3 levels of N as A/S: N\(_0\) =0, N\(_1\) =30 lb./ac, of N.
   (2) 3 levels of P\(_2\)O\(_5\) as Super: P\(_0\) =0, P\(_1\) =60 and P\(_2\) =120 lb./ac. of P\(_2\)O\(_5\).
   (3) 2 levels of K\(_2\)O as Pot. Sul.: K\(_0\) =0 and K\(_1\) =80 lb./ac. of K\(_2\)O.

3. DESIGN:
   (i) 3×2 Fact. in R.B.D.  
   (ii) (a) 6 plots/block and 3 blocks/replication.  
   (iii) 20, 21.7.1951.  
   (iv) (a) to (e) N.A.  
   (v) N.A.  
   (vi) N.A.  
   (vii) Irrigated.  
   (viii) Weeding.

4. GENERAL:
   (i) Satisfactory.  
   (ii) Nil.  
   (iii) Grain yield.  
   (iv) (a) 1951—N.A.  
   (b) N.A.  
   (c) N.A.  
   (v) (a) and (b) No.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 2034 lb./ac.  
   (ii) 674.7 lb./ac.
   (iii) N effect is highly significant. Interaction N×P is highly significant, interaction N×K and P×K are significant while other effects are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>P(_0)</th>
<th>P(_1)</th>
<th>P(_2)</th>
<th>Mean</th>
<th>K(_0)</th>
<th>K(_1)</th>
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</thead>
<tbody>
<tr>
<td>N(_0)</td>
<td>1507</td>
<td>2241</td>
<td>1966</td>
<td>1905</td>
<td>1822</td>
</tr>
<tr>
<td>N(_1)</td>
<td>1933</td>
<td>1947</td>
<td>1980</td>
<td>1933</td>
<td>1924</td>
</tr>
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<td>N(_2)</td>
<td>2260</td>
<td>2145</td>
<td>2326</td>
<td>2244</td>
<td>2229</td>
</tr>
<tr>
<td>Mean</td>
<td>1900</td>
<td>2111</td>
<td>2091</td>
<td>2034</td>
<td>1952</td>
</tr>
<tr>
<td>K(_0)</td>
<td>1856</td>
<td>2116</td>
<td>2003</td>
<td>1905</td>
<td>1822</td>
</tr>
<tr>
<td>K(_1)</td>
<td>1944</td>
<td>2105</td>
<td>2179</td>
<td>1933</td>
<td>1924</td>
</tr>
</tbody>
</table>

S.E. of N or P marginal mean =137.7 lb./ac.  
S.E. of K marginal mean =112.4 lb./ac.  
S.E. of body of N×P table =238.4 lb./ac.  
S.E. of body of K×P or K×N table =194.8 lb./ac.

Crop := Paddy (Kharij)  
Ref := I.A.R.I. 52(60).  
Type := 'M'.

Object := To determine the nutritional requirement of Pusa soils.

1. BASAL CONDITIONS:
   (i) (a) No.  
   (b) Paddy.  
   (c) As per treatments.  
   (ii) (a) and (b) N.A.  
   (iii) 9 to 11.8.1952.  
   (iv) (a) Ploughing with victory plough twice and desi plough twice.  
   (b) to (e) N.A.  
   (v) Nil.  
   (vi) N.P.  
   (vii) Nil.

2. TREATMENTS:
   11 sprayings of micro-nutrients: T\(_0\) =No spraying (control), T\(_1\) =No spraying, T\(_2\) =Zinc sulphate at 25 lb./ac., T\(_3\) =Manganese sulphate at 20 lb./ac., T\(_4\) =Copper sulphate at 20 lb./ac., T\(_5\) =Ferrous sulphate at 100 lb./ac., T\(_6\) =Magnesium sulphate at 100 lb./ac., T\(_7\) =Borax at 15 lb./ac., T\(_8\) =N.A., T\(_9\) =All micro-nutrients and T\(_10\) =All micro-nutrients.

For all treatments T\(_1\) to T\(_4\), 40 lb./ac. of N, 60 lb./ac. of P\(_2\)O\(_5\) and 30 lb./ac. of K\(_2\)O have been applied. Sources for N, P and K are not available.
3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 48.5'×9'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Damaged by rats. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) Nil. (vii) The exp't was conducted at Central Botanical Sub-station Pusa (Bihar).

5. RESULTS
(i) 1691 lb/ac.
(ii) 190.6 lb/ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
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<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₂</td>
<td>854</td>
<td>T₄</td>
<td>1104</td>
</tr>
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<td>T₃</td>
<td>1117</td>
<td>T₅</td>
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<td>T₇</td>
<td>1069</td>
<td>T₉</td>
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</tr>
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<td></td>
<td></td>
<td>T₁₀</td>
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<tr>
<td>S.E./mean</td>
<td></td>
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<td>110.0 lb/ac.</td>
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</tbody>
</table>


Object:—To determine the nutritional requirement of Pusa soils.

1. BASAL CONDITIONS:
(i) (a) No. (b) Paddy. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 5, 6-8.1953. (iv) (a) 1 ploughing with empire plough and 1 ploughing with desi plough. (b) to (e) N.A. (v) Paddy N.P. 130. (vi) Irrigated. (vii) 2 weedings. (ix) 37.32'. (x) 14, 15.12.1953.

2. TREATMENTS:
11 sprayings of micro-nutrients: T₀=No spraying (control), T₁=No spraying, T₂=Zinc sulphate at 25 lb/ac., T₃=Manganese sulphate at 20 lb/ac., T₄=Copper sulphate at 20 lb/ac., T₅=Ferrous sulphate at 100 lb/ac., T₆=Magnesium sulphate at 100 lb/ac., T₇=Borax at 15 lb/ac., T₈=N.A., T₉=All micro-nutrients and T₁₀=All micro-nutrients.

For all treatments T₁ to T₉, 40 lb/ac. of N, 60 lb/ac. of P₂O₅ and 30 lb/ac. of K₂O have been applied. Sources for N, P and K are not available.

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 4. (iv) (a) 48.5'×9'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1954. (b) Yes. (c) Nil. (v) (a) and (b) No. (vi) Nil. (vii) This experiment was conducted at the Central Botanical Sub-station, Pusa (Bihar).

5. RESULTS
(i) 2489 lb/ac.
(ii) 600.5 lb/ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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<tr>
<td>T₀</td>
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<td>T₄</td>
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</tr>
<tr>
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</tr>
<tr>
<td>T₅</td>
<td>2486</td>
<td>T₉</td>
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</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td>300.3 lb/ac.</td>
</tr>
</tbody>
</table>
Crop :- Paddy.  
Ref :- I.A.R.I. 51(42).  
Type :- ‘C’.  
Object :- To find out the best method of growing Paddy.

1. **BASAL CONDITIONS :**
   (i) (a) Nil. (b) and (c) N.A.  
   (ii) (a) and (b) N.A.  
   (iii) 22.7.1951.  
   (iv) (a) Ploughing twice with dest plough.  
   (b) Broadcasting.  
   (c) 40 sr./ac.  
   (d) and (e) N.A.  
   (v) Nil.  
   (vi) N.A.  
   (vii) Irrigated.  
   (viii) Twice weeding and thinning.  
   (ix) 13.51’.  
   (x) 4 to 7.11.1951.

2. **TREATMENTS :**
   3 cultural treatments:  
   $T_1$ = Broadcasting at 40 sr./ac.,  
   $T_2$ = Transplanting at 10 sr./ac. and  
   $T_3$ = Drilling at 20 sr./ac.

3. **DESIGN :**
   (i) R.B.D.  
   (ii) (a) 3.  
   (b) N.A.  
   (iii) 3.  
   (iv) (a) 48’×22.67’.  
   (b) N.A.  
   (v) N.A.  
   (vi) Yes.

4. **GENERAL :**
   (i) Good.  
   (ii) N.A.  
   (iii) Grain yield.  
   (iv) (a) N.A.  
   (b) No.  
   (c) Nil.  
   (v) (a) and (b) No.  
   (vi) Nil.  
   (vii) The experiment was conducted at the Karnal Sub-Station, Karnal (Punjab).

5. **RESULTS :**
   (i) 1407 lb./ac.  
   (ii) 548.5 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>
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</tr>
<tr>
<td>$T_2$</td>
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</tr>
<tr>
<td>$T_3$</td>
<td>1334</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=223.9 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Wheat (Rabi).  
Ref :- I.A.R.I. 50(14).  
Type :- ‘M’.  
Object :-To study the residual effect of fertilizers applied to maize in Kharif' on yield of Wheat.

1. **BASAL CONDITIONS :**
   (i) (a) Maize—Wheat. (b) Maize. (c) As per treatments.  
   (ii) (a) and (b) Refer item 11 on page 143.  
   (iii) N.A.  
   (iv) (a) 2 discings with tractor. (b) to (e) N.A.  
   (v) N.A.  
   (vi) N.P. 710.  
   (vii) Irrigated.  
   (viii) Nil.  
   (ix) (a) and (a) N.A.  

2. **TREATMENTS :**
   All combinations of (1), (2) and (3)
   (1) 3 levels of $N$: $N_0=0$, $N_1=40$ and $N_2=80$ lb./ac.  
   (2) 3 levels of $P_2O_5$: $P_0=0$, $P_1=40$ and $P_2=80$ lb./ac.  
   (3) 2 levels of $K_2O$: $K_0=0$ and $K_2=60$ lb./ac.  
   Manures applied to previous crop Maize in kharif 1950.

3. **DESIGN :**
   (i) $3\times3\times2$ Fact. confounded. (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A.  
   (iii) 2.  
   (iv) (a) 42’×22’. (b) 37’×19’. (v) N.A.  
   (vi) Yes.

4. **GENERAL :**
   (i) Normal. (ii) NIL. (iii) Grain yield. (iv) (a) Kharif 1949—1953. (b) Yes. (c) N.A.  
   (v) (a) and (b) No. (vi) Nil. (vii) N×P two way table is N.A.

5. **RESULTS :**
   (i) 2296 lb./ac.  
   (ii) 453.4 lb./ac.  
   (iii) Effects of $N$, $P$, $N\times K$ and $P\times K$ 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>P₀</th>
<th>P₁</th>
<th>P₂</th>
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<tr>
<td>K₁</td>
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<td>2217</td>
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<tr>
<td>Mean</td>
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<td>2287</td>
<td>2751</td>
<td>2296</td>
<td>1920</td>
<td>2392</td>
<td>2577</td>
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</tbody>
</table>

S.E. of N or P marginal mean = 130.9 lb./ac.
S.E. of K marginal mean = 106.9 lb./ac.
S.E. of body of N x K or K x P table = 185.1 lb./ac.

Crop: Wheat (Rabi).
Ref: I.A.R.I. 51(11).
Type: 'M'.

Object: To study the residual effect of fertilizers applied to maize in Kharif on yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Maize-Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1.12.1951. (iv) (a) Ploughing twice with desi plough on 30.11.1951. (b) to (c) N.A. (v) N.A. (vi) N.P. 710. (vii) Irrigated. (viii) N.A. (x) 17.4.1952.

2. 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 x P₁ x P₂ = 0, P₁ = 40 and P₂ = 80 lb./ac.
(3) 2 levels of K₀ x K₁: K₀ = 0, and K₁ = 60 lb./ac.
Manures applied to the previous crop maize.

3. DESIGN:
(i) 3 x 3 x 2 Fact. confounded. (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 42' x 22'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) The crop had a luxuriant growth in N treated plots which lodged badly after the hail storm on 1.3.1952. (ii) Nil. (iii) Grain yield. (iv) (a) 1949-1953. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) Heavy hail storm on 1.3.1952 and a light hail storm on 15.3.1952. (vii) Nil.

5. RESULTS:
(i) 5.75 lb./ac.
(ii) 52.16 lb./ac.
(iii) N effects is highly significant. P effect and interaction N x P and N x K are significant. Others are not 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>
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</table>
Crop :- Wheat (Rabi).  
Ref :- I.A.R.I. 52(22). Type :- 'M'.

Object :-To study the residual effect of fertilizers applied to maize in Kharif on yield of Wheat.

1. BASAL CONDITIONS :
(i) (a) Maize-Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3.12.1952. (iv) (a) Ploughing with victory plough on 1.12.1952 and ploughing across with deals plough on 2.12.1952. (b) to (e) N.A. (vi) N.A. (vii) N.P-710. (viii) Irrigated. (ix) N.A. (x) N.A. (a) 12.4.1953.

2. 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 P₂₀ : P₀ =0, P₁ =40 and P₂ =80 lb./ac.
(3) 2 levels of K₂₀ : K₀ =0 and K₁ =60 lb./ac.
Manures applied to the previous crop maize.

3. DESIGN :
(i) 3x3x2 fact. confounded. (ii) (a) 6 plots/block and 3 blocks/repllication. (b) N.A. (iii) 2. (iv) (a) 42'x22'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (v) Prevalence of hot weather in February and March hastened maturity abruptly with the result that grain did not develop fully. (vii) Nil.

5. RESULTS :
(i) 1502 lb./ac.
(ii) 114.4 lb./ac.
(iii) N and P effects are highly significant and interaction N×P is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>K₀</th>
<th>K₁</th>
<th>Mean</th>
<th>P₀</th>
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<th>P₂</th>
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<td>1589</td>
<td>1650</td>
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<td>1615</td>
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<td>S.E. of N or P marginal mean</td>
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<td></td>
<td></td>
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<tr>
<td>S.E. of K marginal mean</td>
<td>=57.20 lb./ac.</td>
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<tr>
<td>S.E. of body of N×K or P×K table</td>
<td>=15.06 lb./ac.</td>
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<tr>
<td>S.E. of body of N×P table</td>
<td>=26.96 lb./ac.</td>
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</table>

Prevalence of hot weather in February and March hastened maturity abruptly with the result that grain did not develop fully.
Crop: Wheat (Rabi).

Ref: I.A.R.I. 53(20). Type: 'M'.

Object: To study the residual effect of fertilizers applied to maize in Kharif on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.11.1953. (iv) (a) Ploughing with victory plough and 4 with desk plough. (b) to (e) N.A. (v) N.A. (vi) N.P. 70. (vii) Irrigated. (viii) BasKharif on 6.1.1954 and weeding on 9.1.1954 and 11.1.1954. (ix) N.A. (x) 16.4.1954

2. 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 P2O5: P3 = 0, P1 = 40 and P2 = 80 lb./ac.
   (3) 2 levels of K2O: K0 = 0 and K1 = 60 lb./ac.

Manures applied to the previous crop maize.

3. DESIGN:
   (i) 3 x 3 x 2 Fact. confounded. (ii) (a) 6 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 42' x 22'. (b) 37' x 19'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 (Kharif)—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1138 lb./ac.
   (ii) 245.5 lb./ac.
   (iii) N effect is highly significant, P effect is significant and others are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>K0</th>
<th>K1</th>
<th>Mean</th>
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</tr>
<tr>
<td>P2</td>
<td>1349</td>
<td>1284</td>
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</table>

S.E. of N or P marginal mean = 71.7 lb./ac.
S.E. of K marginal mean = 58.6 lb./ac.
S.E. of body of N x K or P x K table = 101.5 lb./ac.
S.E. of body of N x P table = 124.3 lb./ac.

Crop: Wheat (Rabi).

Ref: I.A.R.I. 50(13). Type: 'M'.

Object: To find out the relative efficiency of different forms of N on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 10.11.1950. (iv) (a) Tractor ploughings on 8.6.1950, grubbing on 29.8.1950 and discing on 3.10.1950. (b) Sown by kera. (c) 70 lb./ac. (d) and (e) N.A. (v) N.A. (vi) N.P. 52. (vii) Irrigated. (viii) Weeding on 8.2.1951. (ix) 2.8'. (x) 17.4.1951.
2. TREATMENTS:
All combinations of (1) and (2)+a control.
(1) 4 sources of N: S₁=A/S, S₂=A/N, S₃=Sodium nitrate and S₄=Urea.
(2) 2 levels of N: N₁=20 and N₂=40 lb./ac.
Manures applied on 2.1.1951 about 52 days after sowing.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 8. (iv) (a) 43' x 17'. (b) 41' x 15'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. Lodging on 25.3.1951 due to rains. (ii) Loose-smut, brown-rust appeared after lodging in the 1st week of March 1951. (iii) Grain yield. (iv) (a) 1949-1950. (b) No. (c) N.A. (v) (a) and (b) No. (vi) October 1950—February 1951 practically dry. Heavy rains and high velocity of wind on 25, 27.3.1951 lodged the crop. After few days of sun-shine the crop came up a little, specially in no manure plots. Practically no loss. (vii) Nil.

5. RESULTS:
(i) 1788 lb./ac.
(ii) 227.1 lb./ac.
(iii) Control vs other and N effects are highly significant. S 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>
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<tr>
<td>N₂</td>
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<td>2032</td>
<td>1864</td>
<td>1950</td>
</tr>
<tr>
<td>Mean</td>
<td>1769</td>
<td>1912</td>
<td>1930</td>
<td>1745</td>
<td>1839</td>
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</table>

S.E. of marginal mean of S = 56.77 lb./ac.
S.E. of marginal mean of N = 40.15 lb./ac.
S.E. of body of table = 80.30 lb./ac.

Crop: Wheat (Rabi). Ref: I.A.R.I. 51(13). Type: 'M'.

Object: To find out the relative efficiency of different forms of N on Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17.11.1951. (iv) (a) Tractor ploughings and tractor grubbing twice on 16.11.1951 after soaking down. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 5, 11.4.1952.

2. TREATMENTS:
All combinations of (1) and (2)+2 extra treatments
(1) 4 sources of N: S₁=A/S, S₂=A/N, S₃=Sodium nitrate and S₄=Urea.
(2) 2 levels of N: N₁=20 and N₂=40 lb./ac.
2 extra treatments: T₀=Control and T₁=60 lb./ac. of P₂O₅+40 lb./ac. of K₂O.
60 lb./ac. of P₂O₅ as Selecto-super+40 lb./ac. of K₂O as Pot. Sul. applied to all combinations of (1) and (2).

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 8. (iv) (a) 1/60 ac. (b) 1/70 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1949-1951. (b) No. (c) N.A. (v) (a) and (b) No. (vi) The crop was heavily damaged, ear heads broken and the crop badly lodged due to hail storm on 1.3.1952. (vii) Nil.
5. RESULTS:
(i) 120.8 lb/ac.
(ii) 24.74 lb/ac.
(iii) Only control vs treated differ highly significantly.
(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>
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<tbody>
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<td>121.1</td>
<td>131.6</td>
<td>126.7</td>
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<tr>
<td>N2</td>
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<td>129.8</td>
<td>130.2</td>
<td>129.2</td>
<td>129.3</td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 6.18 lb/ac.
S.E. of N marginal mean = 4.37 lb/ac.
S.E. of body of table or selective treatments = 8.74 lb/ac.

Crop: Wheat (Rabi). Ref: I.A.R.I. 52(10). Type: 'M'.

Object: To study the effect of organic and inorganic manures on the yield of Wheat.
Crop: Winter Wheat (Rabi).
Ref: I.A.R.I. 53(15).
Type: ‘M’.

Object: To study the effect of inorganic and organic manures on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 11.11.1953. (iv) (a) Dry victory plough given on 12.12.1953 and desi plough on 9 and 10.11.1953. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 harrowing and 1 weeding. (ix) N.A. (x) 20.4.1954.

2. TREATMENTS:
   1. Control.
   2. A/S at 60 lb./ac. of N + Super at 100 lb./ac. of P₂O₅.
   3. A/S at 60 lb./ac. of N + Super at 100 lb./ac. of P₂O₅ + Potash at 100 lb./ac. of K₂O.
   4. FYM at 60 lb./ac. of N + Super at 100 lb./ac. of P₂O₅ + Potash at 100 lb./ac. of K₂O.
   5. Castor cake at 60 lb./ac. of N + Super at 100 lb./ac. of P₂O₅ + Potash at 100 lb./ac. of K₂O.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'x29'. (b) 36'x27'. (v) I' on each side. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 to 1956. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1252 lb./ac.
   (ii) 314.3 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

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<th>Treatment</th>
<th>Av. yield</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>3.</td>
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<tr>
<td>4.</td>
<td>1061</td>
</tr>
<tr>
<td>5.</td>
<td>1385</td>
</tr>
</tbody>
</table>

S.E./mean = 128.3 lb./ac.
5. RESULTS:
(i) 1261 lb./ac.
(ii) 310.2 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
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</thead>
<tbody>
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<tr>
<td>2</td>
<td>1065</td>
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<td>3</td>
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</tr>
<tr>
<td>5</td>
<td>1249</td>
</tr>
<tr>
<td>6</td>
<td>991</td>
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</table>
S.E./mean = 126.6 lb./ac.

Crop is Wheat (Rabi). Ref: I.A.R.I. 50(53). Type 'M'.

Object: To study the effect of the time of turning in the sahn hemp crop with and without fertilizers on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.11.1950. (iv) (a) 1 grubbing, 2 ploughings and 2 discing. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) N.A. (a) N.A. (x) 13.4.1951 to 16.4.1951.

2. TREATMENTS:
Main-plot treatments:
4 times of ploughing in of sann hemp: M1 = After 4 weeks of sowing, M2 = After 6 weeks of sowing, M3 = After 8 weeks of sowing and M4 = After 10 weeks of sowing.

Sub-plot treatments:
4 applications of manures to sann hemp: S1 = Super at 80 lb./ac. of P2O5 at sowing sahn hemp, S2 = N/S at 15 lb./ac. of N at burying of sann hemp, S3 = S2 + S2 and S4 = No fertilizers.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 35' X 20'. (b) 32' X 17'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Germination was uniform. Growth in general was well. (ii) Attack of white ants was observed in 2nd and 3rd week of December 1950. (iii) Grain yield. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1590 lb./ac.
(ii) (a) 314.3 lb./ac.
(b) 162.9 lb./ac.
(iii) M effects and interaction M X S are highly significant while S effects is 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>
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<td>1651</td>
<td>1719</td>
</tr>
<tr>
<td>S2</td>
<td>1611</td>
<td>1441</td>
<td>1741</td>
<td>1341</td>
<td>1533</td>
</tr>
<tr>
<td>S3</td>
<td>1521</td>
<td>1501</td>
<td>1962</td>
<td>1521</td>
<td>1626</td>
</tr>
<tr>
<td>S4</td>
<td>1391</td>
<td>1361</td>
<td>1902</td>
<td>1251</td>
<td>1484</td>
</tr>
<tr>
<td>Mean</td>
<td>1556</td>
<td>1433</td>
<td>1924</td>
<td>1448</td>
<td>1590</td>
</tr>
</tbody>
</table>
S.E. of difference of two
1. M marginal means = 11.1 lb./ac.
2. S marginal means = 57.6 lb./ac.
3. S means at the same level of M = 115.2 lb./ac.
4. M means at the same level of S = 149.3 lb./ac.

Crop :- Wheat (Rabi).
Ref :- I.A.R.I. 51(54).
Type :- 'M'.

Object :- To study the effect of time of turning in a green manuring crop (sannahemp) with and without fertilizers on the yield of Wheat.

1. BASAL CONDITIONS :
(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13.11.1951. (iv) (a) Tractor ploughing and tractor discing to sannahemp and country ploughing and tractor discing twice to wheat. (b) to (e) N.A. (v) N.A. (vi) Irrigated. (vii) N.A. (ix) N.A. (x) 7.4.1952.

2. TREATMENTS :
Main-plot treatments:
4 times of ploughing of Sannahemp : M₁ = Sannahemp buried after 4 weeks on 9.8.1951, M₂ = Sannahemp buried after 6 weeks on 1.9.1951, M₃ = Sannahemp buried after 8 weeks on 14.9.1951, M₄ = Sannahemp buried after 10 weeks on 29.9.1951 and 1.10.1951.
A/S applied on each burying.
Sub-plot treatments:
4 applications of manures to sannahemp : S₁ = Super at 80 lb./ac. of P₂O₅ at sowing sannahemp, S₂ = A/S at 15 lb./ac. of N at burying sannahemp, S₃ = S₁ + S₂ and S₄ = No manure.

3. DESIGN :
(i) Split-plot. (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Germination normal. The growth due to various treatments was distinct. Treatments M₃ and M₄ showed good growth in comparison to M₂ and M₁. Crop lodged completely due to hail storm on 1.3.1952.
(ii) Aphid attack. (iii) Grain yield. (iv) (a) 1950-1953. (b) No. (c) N.A. (v) (a) and (b) No. (v) and (vii) Nil.

5. RESULTS :
(i) 1190 lb./ac.
(ii) (a) 155.8 lb./ac.
(b) 241.9 lb./ac.
(iii) M and S effects are highly significant. Interaction M × S is significant.
(iv) Av. yield of grain in lb./ac.

\[\begin{array}{cccc}
S₁ & 1301 & 990 & 1650 & 1320 \\
S₂ & 1063 & 825 & 1173 & 1136 \\
S₃ & 1338 & 1136 & 1888 & 1448 \\
S₄ & 990 & 788 & 1063 & 936 \\
\hline
Mean & 1173 & 935 & 1443 & 1210 \\
\end{array}\]

\[\begin{array}{c}
\text{Mean} \\
1190 \\
\end{array}\]

S.E. of difference of two
1. M marginal means = 69.23 lb./ac.
2. S marginal means = 85.54 lb./ac.
3. S means at the same level of M = 171.07 lb./ac.
4. M means at the same level of S = 163.51 lb./ac.
Crop: Wheat (Rabi).  
Ref: I.A.R.I. 52(55).  
Type: ‘M’.

Object: To study the effect of the time of turning in of the green manuring crop (Sannhemp) with and without fertilizers.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) N.A.  (c) N.A.  (iii) (a) and (b) Refer item 11 on page 143.  (iii) 1.11.1952.  (iv) (a) Tractor discing twice and country ploughing twice.  (b) Sown with drill.  (c) to (e) N.A.  (v) N.A.  (vi) N.A.  (vii) Irrigated.  (viii) Weeding on 23.1.1953 and 2, 3.2.1953.  (ix) N.A.  (x) 29, 30.3.1953.

2. TREATMENTS:
   Main-plot treatments:
   4 times of ploughing in of sannhemp: M1 = Sannhemp buried after 4 weeks, M2 = Sannhemp buried after 6 weeks and M3 = Sannhemp buried after 8 weeks and M4 = Sannhemp buried after 10 weeks.
   Super broadcasted on 2.7.1952.
   Sub-plot treatments:
   4 applications of manures to sannhemp. S1 = Super 80 lb./ac. P2O5 at sowing of sannhemp, S2 = A/S at 15 lb./ac. N at burying in of sannhemp, S3 = S1+S2 and S4 = No manure.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 4 main-plots/block and 4 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 1/60 acre.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Germination normal and growth satisfactory.  (ii) N.A.  (iii) Grain yield.  (iv) (a) Kharif 1950—N.A.  (b) No.  (c) N.A.  (v) (a), (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1938 lb./ac.
   (ii) (a) 333.3 lb./ac.
   (b) 337.4 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

   \[
   \begin{array}{cccc|c}
   & M_1 & M_2 & M_3 & M_4 & \text{Mean} \\
   S_1 & 1403 & 1680 & 2419 & 2053 & 1938 \\
   S_2 & 1907 & 2016 & 2181 & 2043 & 2037 \\
   S_3 & 1750 & 2107 & 2401 & 1888 & 2006 \\
   S_4 & 1686 & 1470 & 1870 & 1750 & 1694 \\
   \text{Mean} & 1709 & 1893 & 2218 & 1933 & 1938 \\
   \end{array}
   \]

   S.E. of difference of two
   1. M marginal means = 117.8 lb./ac.
   2. S marginal means = 119.3 lb./ac.
   3. S means at the same level of M = 218.6 lb./ac.
   4. M means at the same level of S = 237.8 lb./ac.

Crop: Wheat (Rabi).  
Ref: I.A.R.I. 52(69).  
Type: ‘M’.

Object: To study the effect of turning in a green manuring crop (sannhemp) with and without fertilizer.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) N.A.  (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 1.11.1952.  (iv) (a) Ploughing with desi plough and tractor discing.  (b) Sown with M. drill.  (c) to (e) N.A.  (v) N.A.  (vi) N.A.  (vii) Irrigated.  (viii) Weeding.  (ix) N.A.  (x) 29, 30.3.1954.
2. **TREATMENTS:**

**Main-plot treatments:**

4 times of ploughing in of sannhemp: 
- \( M_1 \) = Sannhemp buried after 4 weeks on 3.8.1953,
- \( M_2 \) = Sannhemp buried after 6 weeks on 17.8.1953,
- \( M_3 \) = Sannhemp buried after 8 weeks on 31.8.1953, and
- \( M_4 \) = Sannhemp buried after 10 weeks on 14.9.1953.

**Sub-plot treatments:**

4 applications of manures to sannhemp:
- \( S_1 \) = Super at 80 lb. P<sub>2</sub>O<sub>5</sub> at sowing of sannhemp,
- \( S_2 \) = A/S at 15 lb. of N at burying in of sannhemp, 
- \( S_3 \) = Super + A/S and
- \( S_4 \) = No manure.

A/S applied on each burying of sannhemp and Super applied on 6.7.1953.

3. **DESIGN:**

(i) Split-plot. (ii) (a) 4 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 acre. (v) N.A. (vi) Yes.

4. **GENERAL:**

(i) Germination satisfactory. Crop growth normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) Yes and (vii) Nil.

5. **RESULTS:**

(i) 1519 lb./ac.
(ii) (a) 1983 lb./ac.
(b) 1209 lb./ac.

(iii) M and S effects are highly significant while interaction M×S is not 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>1542</td>
<td>1707</td>
<td>1898</td>
<td>1488</td>
<td>1659</td>
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<tr>
<td>( S_2 )</td>
<td>1285</td>
<td>1489</td>
<td>1590</td>
<td>1238</td>
<td>1400</td>
</tr>
<tr>
<td>( S_3 )</td>
<td>1567</td>
<td>1664</td>
<td>1660</td>
<td>1491</td>
<td>1645</td>
</tr>
<tr>
<td>( S_4 )</td>
<td>1240</td>
<td>1266</td>
<td>1637</td>
<td>1343</td>
<td>1371</td>
</tr>
<tr>
<td>Mean</td>
<td>1409</td>
<td>1531</td>
<td>1746</td>
<td>1390</td>
<td>1519</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means = 70.12 lb./ac.
2. S marginal means = 42.75 lb./ac.
3. S means at the same level of M = 85.50 lb./ac.
4. M means at the same level of S = 101.96 lb./ac.

---

**Crop:** Wheat (**Rabi**).  **Ref:** I.A.R.I. 48(2).  **Type:** 'M'.

Object:—To compare the efficiency of N from different sources along with two green manures in Fallow—Wheat rotation.

1. **BASAL CONDITIONS:**

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item II on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. **TREATMENTS:**

1. G.M. sannhemp (**in situ**).
2. G.M. cowpeas (**in situ**).
3. Rape cake at 40 lb./ac. of N.
4. Castor cake at 40 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. Leaf compost at 40 lb./ac. of N.
7. A/S at 40 lb./ac. of N.
8. Control.

3. **DESIGN:**

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 8. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. **GENERAL:**

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 1808 lb./ac.
(ii) 232.9 lb./rc.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2000</td>
<td>5.</td>
<td>1539</td>
</tr>
<tr>
<td>2.</td>
<td>1868</td>
<td>6.</td>
<td>1901</td>
</tr>
<tr>
<td>3.</td>
<td>1868</td>
<td>7.</td>
<td>1909</td>
</tr>
<tr>
<td>4.</td>
<td>1662</td>
<td>8.</td>
<td>1720</td>
</tr>
</tbody>
</table>

S.E./mean = 62.36 lb./ac.


Object: To study the effect of low doses of P2O5 on Wheat.

1. BASAL CONDITIONS:

(i) (a) Cowpea-Wheat. (b) Cowpea. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS:

1. F.Y.M. at 16 lb./ac. of P2O5
2. F.Y.M. at 32 lb./ac. of P2O5
3. F.Y.M. at 64 lb./ac. of P2O5
4. Super at 16 lb./ac. of P2O5
5. Super at 32 lb./ac. of P2O5
6. Super at 64 lb./ac. of P2O5
7. Super+F.Y.M. to give 16 lb./ac. of P2O5 in 1:1 ratio.
8. Super+F.Y.M. to give 32 lb./ac. of P2O5 in 1:3 ratio.
9. Super+F.Y.M. to give 64 lb./ac. of P2O5 in 1:7 ratio.
10. Super+F.Y.M. to give 32 lb./ac. of P2O5 in 3:1 ratio.
11. Super+F.Y.M. to give 64 lb./ac. of P2O5 in 7:1 ratio.
12. No manure.
13. Fallow.

These treatments were applied to the first three crops of berseem.

3. DESIGN:

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) to (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1941-1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1307 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1053</td>
<td>5.</td>
<td>1226</td>
</tr>
<tr>
<td>2.</td>
<td>1325</td>
<td>6.</td>
<td>1498</td>
</tr>
<tr>
<td>3.</td>
<td>1498</td>
<td>10.</td>
<td>1399</td>
</tr>
<tr>
<td>4.</td>
<td>1168</td>
<td>11</td>
<td>1654</td>
</tr>
<tr>
<td>5.</td>
<td>1391</td>
<td>12</td>
<td>1045</td>
</tr>
<tr>
<td>6.</td>
<td>1679</td>
<td>13</td>
<td>741</td>
</tr>
<tr>
<td>7.</td>
<td>1308</td>
<td>14</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

S.E./mean = N.A.


Object: To study the effect of low doses of P2O5 on Wheat.

1. BASAL CONDITIONS:

(i) (a) Fallow-Wheat. (b) Fallow. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) to (x) N.A.
2. TREATMENTS:

1. F.Y.M. at 16 lb./ac. of P₂O₅
2. F.Y.M. at 32 lb./ac. of P₂O₅
3. F.Y.M. at 64 lb./ac. of P₂O₅
4. Super at 16 lb./ac. of P₂O₅
5. Super at 32 lb./ac. of P₂O₅
6. Super at 64 lb./ac. of P₂O₅
7. Super+F.Y.M. (1 : 1) at 16 lb./ac. of P₂O₅
8. Super+F.Y.M. (1 : 3) at 32 lb./ac. of P₂O₅
9. Super+F.Y.M. (3 : 1) at 64 lb./ac. of P₂O₅
10. Super+F.Y.M. (1 : 7) at 32 lb./ac. of P₂O₅
11. Super+F.Y.M. (7 : 1) at 64 lb./ac. of P₂O₅
12. No manure.
13. Fallow.

These treatments were applied to first three crops of berseem.

3. DESIGN:

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 12. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1941—1953. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1375 lb./ac.
(ii) 342.3 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1226</td>
<td>8</td>
<td>1448</td>
</tr>
<tr>
<td>2</td>
<td>1300</td>
<td>9</td>
<td>1539</td>
</tr>
<tr>
<td>3</td>
<td>1547</td>
<td>10</td>
<td>1514</td>
</tr>
<tr>
<td>4</td>
<td>1136</td>
<td>11</td>
<td>1794</td>
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<tr>
<td>5</td>
<td>1391</td>
<td>12</td>
<td>946</td>
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<td>6</td>
<td>1733</td>
<td>13</td>
<td>946</td>
</tr>
<tr>
<td>7</td>
<td>1333</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S.E./mean</td>
<td>=98.81 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

Crop: Wheat (Rahi).

Ref: I.A.R.I. 52(76). Type: ‘M’.

Object: To study the effect of low doses of P₂O₅ on Wheat.

1. BASAL CONDITIONS:

(i. (a) Cowpea-Wheat. (b) Cowpea. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS:

1. F.Y.M. at 16 lb./ac. of P₂O₅
2. F.Y.M. at 32 lb./ac. of P₂O₅
3. F.Y.M. at 64 lb./ac. of P₂O₅
4. Super at 16 lb./ac. of P₂O₅
5. Super at 32 lb./ac. of P₂O₅
6. Super at 64 lb./ac. of P₂O₅
7. Super+F.Y.M. to give 16 lb./ac. of P₂O₅ in 1 : 1 ratio.
8. Super+F.Y.M. to give 32 lb./ac. of P₂O₅ in 1 : 3 ratio.
9. Super+F.Y.M. to give 64 lb./ac. of P₂O₅ in 1 : 7 ratio.
10. Super+F.Y.M. to give 32 lb./ac. of P₂O₅ in 3 : 1 ratio.
11. Super+F.Y.M. to give 64 lb./ac. of P₂O₅ in 7 : 1 ratio.
12. No manure.
13. Fallow.

These treatments were applied to first three crops of berseem.

3. DESIGN:

(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1941—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1365 lb./ac.
(ii) N.A.
(iii) N.A.
Crop : Wheat (Rabi).  
Ref : I.A.R.I. 52(66).  
Type : 'M'.

Object : To study the effect of low doses of P2O5 on Wheat.

1. BASAL CONDITIONS :
(i) (a) Fallow—Wheat. (b) Nil. (c) Nil.  
(ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS :
1. F.Y.M. at 16 lb./ac. of P2O5  
2. F.Y.M. at 32 lb./ac. of P2O5  
3. F.Y.M. at 64 lb./ac. of P2O5  
4. Super at 16 lb./ac. of P2O5  
5. Super at 32 lb./ac. of P2O5  
6. Super at 64 lb./ac. of P2O5  
7. Super+F.Y.M. to give 16 lb./ac. P2O5 in 1:1 ratio.

These treatments were applied to the first three crops of berseem.

3. DESIGN :
(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 12. (iv) (a), (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL :
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1941 to 1953. (b) Yes. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 1770 lb./ac.  
(ii) 484.7 lb./ac.  
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1372</td>
<td>8.</td>
<td>1703</td>
</tr>
<tr>
<td>2.</td>
<td>1378</td>
<td>9.</td>
<td>2006</td>
</tr>
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<td>3.</td>
<td>1605</td>
<td>10.</td>
<td>2131</td>
</tr>
<tr>
<td>4.</td>
<td>1656</td>
<td>11.</td>
<td>2065</td>
</tr>
<tr>
<td>5.</td>
<td>1901</td>
<td>12.</td>
<td>1251</td>
</tr>
<tr>
<td>6.</td>
<td>2561</td>
<td>13.</td>
<td>1037</td>
</tr>
<tr>
<td>7.</td>
<td>1627</td>
<td>S.E./mean</td>
<td>=139.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Wheat (Rabi).  
Ref : I.A.R.I. 53(41).  
Type : 'M'.

Object : To study the effect of low doses of P2O5 on Wheat.

1. BASAL CONDITIONS :
(i) (a) Cowpea—Wheat. (b) Cowpea. (c) N.A.  
(ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) to (x) N.A.
2. **TREATMENTS:**

1. F.Y.M. at 16 lb./ac. of P$_2$O$_5$  
2. F.Y.M. at 32 lb./ac. of P$_2$O$_5$  
3. F.Y.M. at 64 lb./ac. of P$_2$O$_5$  
4. Super at 16 lb./ac. of P$_2$O$_5$  
5. Super at 32 lb./ac. of P$_2$O$_5$  
6. Super at 64 lb./ac. of P$_2$O$_5$  
7. Super + F.Y.M. to give 16 lb./ac. of P$_2$O$_5$

These treatments were applied to the first three crops of berseem.

3. **DESIGN:**

1. R.B.D.  
2. (a) 13. (b) N.A.  
3. (i) Grain yield.  
4. (a) 1941 to 1953.  
5. (b) Yes.  
6. (c) N.A.  
7. (v) Nil.  
8. (vi) Yes.

4. **GENERAL:**

1. N.A.  
2. (a) N.A.  
3. (ii) N.A.  
4. (iii) Grain yield.  
5. (iv) (a) 1941 to 1953.  
6. (b) Yes.  
7. (c) N.A.  
8. (v) N.A.  
9. (vi) Nil.

5. **RESULTS:**

1. 1446 lb./ac.  
2. 600.7 lb./ac.  
3. Treatments do not differ significantly.

---

**Crop :** Wheat **(Rabi).**  
**Ref :** I.A.R.I. 53(36).  
**Type :** ‘M’.

Object :—To study the effect of low doses of P$_2$O$_5$ on Wheat.

1. **BASAL CONDITIONS :**

1. (a) Fallow—Wheat.  
2. (b) Fallow.  
3. (c) Nil.  
4. (i) N.A.  
5. (ii) N.A.  
6. (iv) N.A.  
7. (v) N.A.  
8. (vi) N.A.

2. **TREATMENTS :**

1. F.Y.M. at 16 lb./ac. of P$_2$O$_5$  
2. F.Y.M. at 32 lb./ac. of P$_2$O$_5$  
3. F.Y.M. at 64 lb./ac. of P$_2$O$_5$  
4. Super at 16 lb./ac. of P$_2$O$_5$  
5. Super at 32 lb./ac. of P$_2$O$_5$  
6. Super at 64 lb./ac. of P$_2$O$_5$  
7. Super + F.Y.M. (1 : 1) at 16 lb./ac. of P$_2$O$_5$

3. **DESIGN :**

1. R.B.D.  
2. (a) 13.  
3. (ii) N.A.  
4. (iii) N.A.  
5. (iv) N.A.  
6. (v) N.A.  
7. (vi) N.A.

4. **GENERAL :**

1. N.A.  
2. (a) N.A.  
3. (i) Grain yield.  
4. (ii) N.A.  
5. (iii) N.A.  
6. (iv) N.A.  
7. (v) N.A.

5. **RESULTS :**

1. 1584 lb./ac.  
2. 690.7 lb./ac.  
3. Treatments do not differ significantly.
Crop: Wheat (Rabi).
Ref:- I.A.R.I. 51(52). Type: 'M'.

Object:—To study the effect of manuring on the yield of Berseem and the residual effect on the rotational crops.

1. BASAL CONDITIONS:
   (i) (a) Berseem—maize—wheat—jowar. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 29.11.1951. (iv) (a) Ploughing with country plough. (b) to (e) N.A. (v) N.A. (vi) N.P.165. (vii) Irrigated. (viii) N.A. (ix) 3.24'. (x) 12.4.1952.

2. TREATMENTS:
   Main-plot treatments:
   7 combinations of N and P₂O₅:
   M₁—Ammo. Phos. at 80 lb./ac. of P₂O₅, M₂—Ammo. Phos. at 160 lb./ac. of P₂O₅, M₃—Super at 80 lb./ac. of P₂O₅+A/S to supply N as in M₁, M₄—Super at 160 lb./ac. of P₂O₅+A/S to supply N as in M₂, M₅—Super at 80 lb./ac. of P₂O₅, M₆—Super at 160 lb./ac. of P₂O₅ and M₇—No manure.

Sub-plot treatments:
3 levels of K₂O as Pot. Sul.: K₀=0, K₁=40 and K₂=80 lb./ac.
(Manures added to berseem in 1950—1951)/ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 7 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4, (iv) (a) 43' X 25', (b) 39' X 21'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1946—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) Very badly damaged by the hailstorms more than 80%. The produce of different plots got mixed up by the severe dust storm and therefore grain yield per plot could not be recorded for the individual plots. (vii) Nil.

5. RESULTS:
   (i) 3720 lb./ac.
   (ii) (a) 1249 lb./ac.
   (b) 819.2 lb./ac.
   (iii) M effect and interaction M × K are significant while K effect is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<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>
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</table>

S.E. of difference of two
1. M marginal means =510.0 lb./ac.
2. K marginal means =218.9 lb./ac.
3. K means at the same level of M =579.3 lb./ac.
4. M means at the same level of K =695.5 lb./ac.
Crop: Wheat (Rabi).
Ref: I.A.R.I. 53(7).
Type: 'M'.

Object: To study the efficiency of fertilisers and their suitable combinations on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 145. (iii) 4 and 5.11.1953. (iv) (a) 1 ploughing with victory plough, 1 with desi plough, 2 discings and 2 levellings. (b) Sowing in furrows by desi plough. (c) 80 lb./ac. (d) N.A. (e) N.A. (vi) N.P. 716. (vii) Irrigated. (viii) Baharung on 5.12.1953. (ix) N.A. (x) 15 to 16.4.1954.

2. TREATMENTS:
   All combinations of (1), (2) and (3).
   (1) 3 levels of P0 as Super: P1 = 0, P2 = 20 and P3 = 40 lb./ac.
   (2) 3 sources of N: S1 = Ammon. Nitr. and S2 = Urea.
   (3) 3 levels of N: N0 = 0, N1 = 20 and N2 = 40 lb./ac.

3 extra treatments:
   T1 = 60 lb./ac. of N as A/8 + 40 lb./ac. of P0 as triple super, T2 = 40 lb./ac. of N as A/8 + 80 lb./ac. of P0 as triple super and T3 = 60 lb./ac. of N as A/8 + 80 lb./ac. of P0 as triple super.

3. DESIGN:
   (i) 3° Conf. with three extra treatments. (ii) (a) 12 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 23'x47' 4". (v) N.A. (vi) Yes.

4. GENERAL:
   (vii) Results of 3 extra treatments are not presented.

5. RESULTS:
   (i) 1623 lb./ac.
   (ii) 196.1 lb./ac.
   (iii) P effect and interaction N x P are highly significant. Others are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N1</th>
<th>P1</th>
<th>Mean</th>
</tr>
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<tr>
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<td>1649</td>
</tr>
<tr>
<td>1750</td>
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<td>1801</td>
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<tr>
<td>Mean</td>
<td>1690</td>
<td>1752</td>
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<table>
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<th>S2</th>
<th>S3</th>
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<tr>
<td>1805</td>
<td>1949</td>
<td>1663</td>
</tr>
<tr>
<td>Mean</td>
<td>1703</td>
<td>1798</td>
</tr>
</tbody>
</table>

S.E. of S and P marginal mean = 56.6 lb./ac.
S.E. of N marginal mean = 46.2 lb./ac.
S.E. of body of N x P or N x S table = 80.1 lb./ac.
S.E. of body of S x P table = 80.1 lb./ac.
S.E. of P means at the level of N0 = 80.1 lb./ac.

---

Crop: Wheat (Rabi).
Ref: I.A.R.I. 52(12).
Type: 'M'.

Object: To study the response of organic manures alone and in combination with inorganic manures.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 145. 
   (iii) 16.11.1952. (iv) (a) 1 ploughing by victory plough, 3 by desi plough and 3 harrowings. (b) to (e) N.A. (v) Nil. (vi) N.P. 700. (vii) Irrigated. (viii) One hoeing. (ix) N.A. (x) 15 to 17.4.1952.
2. TREATMENTS:

1. Control.
2. 60 lb./ac. of N as A/S+100 lb./ac. of P₂O₅ as Super.
3. 60 lb./ac. of N as A/S+100 lb./ac. of P₂O₅ as Super+100 lb./ac. of K₂O as Pot. Sul.
4. 60 lb./ac. of N as F.Y.M.+100 lb./ac. of P₂O₅ as Super+100 lb./ac. of K₂O as Pot. Sul.
5. 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) (a) 5. (b) N.A. (iii) 6. (iv) (a) 36' x 29'. (b) 36' x 27'. (v) 1' on each side. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 368.9 lb./ac.
(ii) 90.35 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
<td>529.1</td>
</tr>
<tr>
<td>3.</td>
<td>505.2</td>
</tr>
<tr>
<td>4.</td>
<td>295.4</td>
</tr>
<tr>
<td>5.</td>
<td>321.7</td>
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<tr>
<td>S.E./mean</td>
<td>36.89 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).  
Ref :- I.A.R.I. 50(4).  
Type :- 'M'.

Object :- To study the relative efficiency of N in bulky or semi-bulky organic manures and inorganic fertilizers on Wheat.

1. BASAL CONDITIONS:

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item [I on page 143. (iii) 12.11.1950. (iv) (a) Grubbing with tractor and discing twice. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) One weeding with khirki. (ix) N.A. (x) N.A.

2. TREATMENTS:

1. Control.
2. 40 lb./ac. of N as F.Y.M.
3. 60 lb./ac. of N as F.Y.M.
4. 80 lb./ac. of N as F.Y.M.
5. 100 lb./ac. of N as F.Y.M.
6. 120 lb./ac. of N as F.Y.M.
7. 20 lb./ac. of N as G.N.C.
8. 40 lb./ac. of N as G.N.C.
9. 60 lb./ac. of N as G.N.C.
10. 80 lb./ac. of N as G.N.C.
11. 20 lb./ac. of N as A/S.
12. 40 lb./ac. of N as A/S.

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 33' x 22'. (b) 31' x 20'. (v) 1' on each side. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Yellow rust. (iii) Grain yield. (iv) (a) 1949—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 2946 lb./ac.
(ii) 384.3 lb./ac.
(iii) Treatments differ highly significantly.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2781</td>
<td>7.</td>
<td>2789</td>
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<td>2.</td>
<td>2419</td>
<td>8.</td>
<td>2995</td>
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<tr>
<td>3.</td>
<td>2896</td>
<td>9.</td>
<td>3151</td>
</tr>
<tr>
<td>4.</td>
<td>2946</td>
<td>10.</td>
<td>3349</td>
</tr>
<tr>
<td>5.</td>
<td>3110</td>
<td>11.</td>
<td>2946</td>
</tr>
<tr>
<td>6.</td>
<td>2921</td>
<td>12.</td>
<td>3069</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td>=134.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat *(Rabi).*

Ref :- I.A.R.I. 51(6). Type :- 'M'.

Object :- To study the relative efficiency of N in bulky or semi-bulky organic manures and inorganic fertilizers on Wheat crop.

1. **BASAL CONDITIONS** :
   (i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.11.1951. (iv) (a) Ploughing by victory plough; beaming and ploughing by country plough. Horse hoe cultivator for mixing manure, grubbing twice by tractor and beaming. (b) to (e) N.A. (v) No. (vi) C. 518. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 12.4.1952.

2. **TREATMENTS** :
   1. No manure.
   2. 40 lb./ac. of N as F.Y.M.
   3. 60 lb./ac. of N as F.Y.M.
   4. 80 lb./ac. of N as F.Y.M.
   5. 100 lb./ac. of N as F.Y.M.
   6. 120 lb./ac. of N as F.Y.M.
   7. 20 lb./ac. of N as G.N.C.
   8. 40 lb./ac. of N as G.N.C.
   9. 60 lb./ac. of N as G.N.C.
   10. 80 lb./ac. of N as G.N.C.
   11. 20 lb./ac. of N as A/S.
   12. 40 lb./ac. of N as A/S.

3. **DESIGN** :
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 31''X22'. (b) 31''X20'. (v) 1' on each side. (vi) Yes.

4. **GENERAL** :
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. **RESULTS** :
   (i) 1206 lb./ac.
   (ii) 232.9 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1105</td>
<td>7.</td>
<td>1117</td>
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<tr>
<td>2.</td>
<td>1112</td>
<td>8.</td>
<td>1354</td>
</tr>
<tr>
<td>3.</td>
<td>1133</td>
<td>9.</td>
<td>1391</td>
</tr>
<tr>
<td>4.</td>
<td>1163</td>
<td>10.</td>
<td>1527</td>
</tr>
<tr>
<td>5.</td>
<td>1121</td>
<td>11.</td>
<td>1180</td>
</tr>
<tr>
<td>6.</td>
<td>1098</td>
<td>12.</td>
<td>1220</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td>=62.35 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Wheat *(Rabi).*

Ref :- I.A.R.I. 52(5). Type :- 'M'.

Object :- To study the relative efficiency of N in bulky or semi-bulky organic manures and inorganic fertilizers on Wheat.

1. **BASAL CONDITIONS** :
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 10.11.1952. (iv) (a) Ploughing with victory plough thrice and deep plough twice. (b) to (e) N.A. (v) Nil. (vi) N.P. 710. (vii) Irrigated. (viii) Weeding once. (ix) N.A. (x) 3/4.5.1953.
2. TREATMENTS:
1. No manure. 7. 20 lb./ac. of N as G.N.C.
2. 40 lb./ac. of N as F.Y.M. 8. 40 lb./ac. of N as G.N.C.
3. 60 lb./ac. of N as F.Y.M. 9. 60 lb./ac. of N as G.N.C.
4. 80 lb./ac. of N as F.Y.M. 10. 80 lb./ac. of N as G.N.C.
5. 100 lb./ac. of N as F.Y.M. 11. 20 lb./ac. of N as A/S.
6. 120 lb./ac. of N as F.Y.M. 12. 40 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) 12. (b) N.A. (iii) 8. (iv) (a) 33'x22'. (b) 31'x20'. (v) 1' on each side. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1949—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1654 lb./ac.
(ii) 286.3 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
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<td>4.</td>
<td>1572</td>
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<td>5.</td>
<td>1484</td>
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<td>1721</td>
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<tr>
<td>6.</td>
<td>1572</td>
<td>12.</td>
<td>1782</td>
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</tbody>
</table>

S.E./mean = 101.2 lb./ac.

Crop :- Wheat (Rabi).  Ref :- I.A.R.I. 52(52).  Type :- 'M'.

Object :- To determine the optimum interval between the application of F.Y.M. and sowing of Wheat to obtain the maximum yield.

1. BASAL CONDITIONS:
(i) (a) Wheat—Maize. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1952. (iv) (a) 2 discings by tractor and 5 desi ploughings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Weedimg and hoising. (ix) N.A. (x) 8 to 15.4.1953.

2. TREATMENTS:
Main-plot treatments: All combinations of (1) and (2) + a control (T0D0 = no manure)
(1) 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.
(2) 3 doses of F.Y.M.: \( D_1 = 2 \), \( D_2 = 5 \) and \( D_3 = 10 \) 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 and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A.
(b) Main-plot: 32'x35' and sub-plot: 32'x18'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1036 lb./ac.
(ii) (a) 286.3 lb./ac.
(b) 273.0 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<td>1018</td>
<td>1035</td>
<td>1059</td>
<td>1094</td>
<td>1011</td>
<td>1103</td>
<td>1191</td>
<td>855</td>
<td>1071</td>
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<tr>
<td>Mean</td>
<td>933</td>
<td>1103</td>
<td>1103</td>
<td>1092</td>
<td>1023</td>
<td>1024</td>
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<td>1044</td>
<td>1033</td>
<td>930</td>
<td>1100</td>
<td>1048</td>
<td>982</td>
<td>1036</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. TD marginal means = 142.2 lb./ac.
2. N marginal means = 53.5 lb./ac.
3. N means at the same level of TD = 193.0 lb./ac.
4. TD means at the same level of N = 197.1 lb./ac.

Crop: Wheat (Rabi).  
Type: ‘M’.

Object: To determine the optimum interval between the application of F.Y.M. and sowing of Wheat to obtain the maximum yield.

1. BASAL CONDITIONS:
   (i) (a) Wheat – Maize. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 4.12.1953.
   (iv) (a) 1 ploughing with victory plough and 3 with desl plough. (b) to (c) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Bakharling. (ix) N.A. (x) 17, 18.4.1954.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)+a control (T2D0=no manure)
   (1) 4 times of application of F.Y.M.: T1=3 months, T2=2 months, T3=1 month and T4=1 week before sowing.
   (2) 3 doses of F.Y.M.: D1=2, D2=5 and D3=10 tons/ac. of F.Y.M.

   Sub-plot treatments:
   2 levels of N as A/S: N0=0 and N1=10 lb./ac. of N as A/S.

3. DESIGN:
   (i) Split-plot. (ii) (a) 13 main-plots/block and 2 sub-plots/main plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) Main-plot: 32’x36’; Sub-plot: 32’x18’.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) 1952—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nill.

5. RESULTS:
   (i) 1460 lb./ac.
   (ii) (a) 313.7 lb./ac.
   (b) 560.1 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T1D0</th>
<th>T1D1</th>
<th>T1D2</th>
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<th>T4D0</th>
<th>T4D1</th>
<th>T4D2</th>
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<tr>
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<td>1499</td>
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<td>1389</td>
<td>1376</td>
<td>1848</td>
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<td>1668</td>
<td>1601</td>
<td>1355</td>
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<td>1596</td>
<td>1386</td>
<td></td>
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</tr>
</tbody>
</table>

S.E. of difference of two
1. TD marginal means = 156.8 lb./ac.
2. N marginal means = 109.8 lb./ac.
3. N means at the same level of TD = 396.0 lb./ac.
4. TD means at the same level of N = 381.7 lb./ac.
Crop: Wheat (Rabi).
Ref: I.A.R.I. 50(6).

Type: 'M'.

Object: To study the soil fertility building capacity of manures applied to berseem in rotation by their effect on the succeeding Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 6.11.1950. (iv) (a) Discing twice and grubbing twice. (b) to (c) N.A. (v) Nil. (vi) N.P. 710. (vii) Irrigated. (viii) 1 lever harrow and 1 weeding. (ix) 2.71'. (x) 4.5. 1951.

2. TREATMENTS:
   All combinations (1) and (2) + a control (no manure)
   (1) 2 levels of P2O5 as Super: P1 = 50 and P2 = 100 lb./ac.
   (2) 2 levels of K2O as Pot. Sul.: K0 = 0 and K1 = 80 lb./ac.
   Manures applied to the previous crop of maize.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 60'x27'. (b) 58'x25'. (v) 1' on each side. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS:
   (i) 738.2 lb./ac.
   (ii) 167.8 lb./ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>K0</td>
<td>785.8</td>
<td>718.3</td>
<td>752.0</td>
</tr>
<tr>
<td>K1</td>
<td>785.8</td>
<td>795.7</td>
<td>790.8</td>
</tr>
<tr>
<td>Mean</td>
<td>785.8</td>
<td>757.0</td>
<td>771.4</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 48.4 lb./ac.
S.E. of body of table or control mean = 68.5 lb./ac.

---

Crop: Wheat (Rabi).
Ref: I.A.R.I. 51(7).

Type: 'M'.

Object: To build up soil fertility by Phosphate manuring of berseem and to study the residual effect on Wheat in rotation.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.11.1951. (iv) (a) 1 ploughing with tractor, discing, one ploughing with desi plough and again with tractor. (b) to (c) N.A. (v) No. (vi) N.P. 710. (vii) Irrigated. (viii) N.A. (ix) 0.86'. (x) 17.4.1952.

2. TREATMENTS:
   All combinations of (1) and (2) + a control (no manure)
   (1) 2 levels of P2O5 as Super: P1 = 50 and P2 = 100 lb./ac.
   (2) 2 levels of K2O as Pot. Sul: K0 = 0 and K1 = 80 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 58'x25'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Badly lodged. (ii) Nil. (iii) Grain yield. (iv) (a) 1946—1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) 1140 lb/ac.
(ii) 193.4 lb/ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>P1</th>
<th>P2</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>K&lt;sub&gt;0&lt;/sub&gt;</td>
<td>1061</td>
<td>1162</td>
<td>1111</td>
</tr>
<tr>
<td>K&lt;sub&gt;1&lt;/sub&gt;</td>
<td>1121</td>
<td>1186</td>
<td>1154</td>
</tr>
<tr>
<td>Mean</td>
<td>1091</td>
<td>1174</td>
<td>1133</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 55.85 lb/ac.
S.E. of body of table or control mean = 78.99 lb/ac.

Crop: Wheat (Rabi).
Ref: I.A.R.I. 50(8).
Type: ‘M’.

Object:—To study the effect of phosphatic manuring of berseem with and without K and N and to study the residual effect on the subsequent Wheat crop.

1. BASAL CONDITIONS:

(i) (a) Berseem-Maize-Cotton-Wheat. (b) Cotton. (c) As per treatments. (ii) (a) and (b) Refer item II on page 143. (iii) 26.11.1950. (iv) (a) One ploughing with victory plough and two with deep plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:

1. Control (no manure).
2. 25 lb/ac. of N as A/S + 120 lb/ac. of P<sub>2</sub>O<sub>5</sub> as Super.
3. 50 lb/ac. of N as A/S + 120 lb/ac. of P<sub>2</sub>O<sub>5</sub> as Super.
4. 100 lb/ac. of N as A/S + 120 lb/ac. of P<sub>2</sub>O<sub>5</sub> as Super.
5. 120 lb/ac. of N as A/S + 120 lb/ac. of P<sub>2</sub>O<sub>5</sub> as Super.
6. 120 lb/ac. of P<sub>2</sub>O<sub>5</sub> as Super.
7. 100 lb/ac. of N as A/S + 120 lb/ac. of P<sub>2</sub>O<sub>5</sub> as Super + 120 lb/ac. of K<sub>2</sub>O as Pot. Sul.
8. Fallow.

Manures applied to the previous crop cotton.

3. DESIGN:

(i) R.B.D. (ii) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36' × 18'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1136 lb/ac.
(ii) 1547 lb/ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>807</td>
</tr>
<tr>
<td>2.</td>
<td>1211</td>
</tr>
<tr>
<td>3.</td>
<td>1208</td>
</tr>
<tr>
<td>4.</td>
<td>1271</td>
</tr>
<tr>
<td>5.</td>
<td>1200</td>
</tr>
<tr>
<td>6.</td>
<td>1191</td>
</tr>
<tr>
<td>7.</td>
<td>1254</td>
</tr>
<tr>
<td>8.</td>
<td>848</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 63.36 lb/ac.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>924</td>
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<tr>
<td>2.</td>
<td>1231</td>
</tr>
<tr>
<td>3.</td>
<td>1558</td>
</tr>
<tr>
<td>4.</td>
<td>1841</td>
</tr>
<tr>
<td>5.</td>
<td>1224</td>
</tr>
<tr>
<td>6.</td>
<td>1812</td>
</tr>
<tr>
<td>7.</td>
<td>924</td>
</tr>
<tr>
<td>8.</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 106.8 lb/ac.</td>
</tr>
</tbody>
</table>
Crop : Wheat (Rabi).

Ref :- I.A.R.I. 52(8).

Type :- 'M'.

Object :- To study the effect of phosphatic manuring of berseem with and without K and N and to study the residual effect on Wheat.

1. BASAL CONDITIONS:

(i) (a) Wheat—Berseem—Cotton. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.12.1952. (iv) (a) Ploughing with victory plough and with desi plough, (b) to (e) N.A. (v) Nil. (vi) N.P. 710. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 12.4.1953.

2. TREATMENTS:

1. Control (no manure).
2. 120 lb./ac. of P_2O_5 as Super.
3. Treat. (2)+120 lb./ac. of K_2O as Pot. Sul.
4. Treat. (2)+25 lb./ac. of N as A/S.
5. Treat. (2)+50 lb./ac. of N as A/S.
6. Treat. (2)+100 lb./ac. of N as A/S.
7. Treat. (3)+100 lb./ac. of N as A/S.
8. Fallow (in berseem season). Manures applied to Berseem during the previous year.

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 30'X18'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 903 lb./ac.
(ii) 147.3 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>621</td>
<td>5.</td>
<td>1008</td>
</tr>
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<td>2.</td>
<td>846</td>
<td>6.</td>
<td>1154</td>
</tr>
<tr>
<td>3.</td>
<td>912</td>
<td>7.</td>
<td>1176</td>
</tr>
<tr>
<td>4.</td>
<td>960</td>
<td>8.</td>
<td>519</td>
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</tbody>
</table>

S.E./mean = 60.14 lb./ac.

---

Crop : Wheat (Rabi).

Ref :- I.A.R.I. 51(30).

Type :- 'M'.

Object :- To study the effect of manured, unmanured, one, two or three years ley farming on soil fertility as judged by the yields of subsequent maize and Wheat crops.

1. BASAL CONDITIONS:

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 29.10.1951. (iv) (a) 1 ploughing with victory plough, 2 ploughings with desi plough and preparatory tillage. (b) to (e) N.A. (v) Nil. (vi) C. 5!8. (vii) Irrigated. (viii) 1 hoeing with oudh plough. (ix) N.A. (x) 7.4.1952.

2. TREATMENTS:

Main-plot treatments:

9 treatments (ley farming) : T_1=One year ley—full dose. T_2=One year ley—no manure. T_3=Two years ley—full dose. T_4=Two years ley—manured once. T_5=Two years ley—no manure. T_6=Three years ley—full dose every year. T_7=Three years ley—full dose two consecutive years. T_8=Three years ley—full dose once and T_9=Three years ley—no manure.

Sub-plot treatments:

4 G.M. treatments : M_1=Dich Anubias Viciaes, M_2=Vicia Lucern. M_3=Rhoders and M_4=Maize—wheat rotation.
3. DESIGN:
(i) Split-plot. (ii) 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80th of an acre. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1949–1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Information given as available. Classification is N.A. Description of (1) to (5) in the results for main-plots N.A.

5. RESULTS:
(i) 547.7 lb./ac.
(ii) (a) 150.6 lb./ac.
(b) 125.9 lb./ac.
(iii) Effect of T is significant. Effect of M and interaction T x M are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
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<td>659.9</td>
<td>619.6</td>
<td>479.7</td>
<td>380.2</td>
<td>539.8</td>
</tr>
<tr>
<td>M2</td>
<td>659.9</td>
<td>700.3</td>
<td>700.3</td>
<td>559.5</td>
<td>619.6</td>
<td>647.9</td>
</tr>
<tr>
<td>M3</td>
<td>559.4</td>
<td>577.6</td>
<td>479.7</td>
<td>440.2</td>
<td>479.7</td>
<td>507.3</td>
</tr>
<tr>
<td>M4</td>
<td>640.2</td>
<td>399.9</td>
<td>539.8</td>
<td>419.7</td>
<td>479.7</td>
<td>495.9</td>
</tr>
</tbody>
</table>

Mean: 604.8 | 584.4 | 584.8 | 474.8 | 489.8 | 547.7

S.E. of difference of two
1. T marginal means = 53.49 lb./ac.
2. M marginal means = 29.62 lb./ac.
3. M means at the same level of T = 88.89 lb./ac.
4. T means at the same level of M = 68.54 lb./ac.

Crop: Wheat (Rabi). Ref: I.A.R.I. 52(71). Type: 'M'.

Object: To study the effect of manured, unmanured, one, two or three years ley farming on soil fertility as judged by the yields of subsequent maize and wheat crop.

1. BASAL CONDITIONS:
(i) (a) Maize—Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.11.1952.
(iv) (a) Ploughing with victory plough and desi plough, preparatory tillage and grubbing with tractor. (b) to (e) N.A. (v) Nil. (vi) C. 518. (vii) Irrigated. (viii) Bakharing and hoeing with oudh plough. (ix) N.A. (x) 7.4.1953.

2. TREATMENTS:
Main-plot treatments
9 treatments (ley farming): T1 = One year ley—full dose of manure, T2 = One year ley—no manure, T3 = Two years ley—twice manured, T4 = Two years ley—once manured, T5 = Two years ley—no manure, T6 = Three years ley—thrice manured, T7 = Three years ley—twice manured, T8 = Three years ley—one manured and T9 = Three years ley—no manure.

Sub-plot treatments:
4 G.M. treatments: M1 = Dich and hume mixture, M2 = Cencush, M3 = Rhodes and M4 = Maize and wheat rotation.

3. DESIGN:
(i) Split-plot. (ii) 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80th ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) No. (iii) Grain yield. (iv) (a) 1949–1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) 762.9 lb./ac.
(ii) (a) 160.0 lb./ac.
(b) 150.4 lb./ac.
(iii) Only M effect is significant.
(iv) Av. yield of grain 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>$T_8$</th>
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<td>741.4</td>
<td>733.2</td>
<td>741.4</td>
<td>762.0</td>
<td>753.8</td>
<td>753.8</td>
<td>770.3</td>
</tr>
<tr>
<td>$M_2$</td>
<td>655.8</td>
<td>733.2</td>
<td>737.3</td>
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<td>758.0</td>
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<td>737.5</td>
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S.E. of difference of two
1. T marginal means
2. M marginal means
3. M means at the same level of T
4. T means at the same level of M


Object: To study the effect of manured, unmanured, one, two and three years ley farming on soil fertility as judged by soil structure.

1. BASAL CONDITIONS:

(i) (a) Maize—Wheat. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.10.1953. (iv) (a) Ploughing with victory plough and desi plough. (b) to (e) N.A. (v) N.A. (vi) N.P. 175. (vii) Irrigated. (viii) Bakaring on 1.12.1953 and 24.12.1953. (ix) N.A. (x) 14.4.1954.

2. TREATMENTS:

Main-plot treatments
5 treatments (ley farming): $T_1$ = One year ley—full dose, $T_2$ = One year ley—no manure, $T_3$ = Two years ley—full dose, $T_4$ = Two years ley—manured once, $T_5$ = Two years ley—no manure. $T_6$ = Three years ley—full dose every year, $T_7$ = Three years ley—2 consecutive years, $T_8$ = Three years ley—once and $T_9$ = Three years ley—no manure.

Sub-plot treatments
4 G.M. treatments: $G_1$ = Dich Ambulantes, vicinative, $G_2$ = Vicia hucus, $G_3$ = Rhodes and $G_4$ = Maize—wheat rotation.

3. DESIGN:

(i) Split-plot. (ii) (a) 9 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) Effected by loose-smut. (iii) Grain yield. (iv) (a) 1949—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 610 lb./ac.
(ii) (a) 113.7 lb./ac.
(b) 124.4 lb./ac.
(iii) Only T effect is significant.
(iv) Av. yield of grain in lb/ac.

<table>
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<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
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S.E. of difference of two
1. T marginal means = 40.9 lb/ac.
2. M marginal means = 29.3 lb/ac.
3. M means at the same level of T = 87.9 lb/ac.
4. T means at the same level of M = 83.3 lb/ac.

Crop: Wheat (Rabi).
Ref: I.A.R.I. 55 (13).
Type: 'M'.

Object: To study the residual effect of fertilizers, applied to berseem, on Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1.2.1953.
   (iv) (a) 1 ploughing with victory plough and 5 by desi plough. (b) to (e) N.A. (v) Nil. (vi) N.P. 710. (vii) Irrigated. (viii) Bakhari on 7.1.1954. (ix) N.A. (x) 16.4.1954.

2. TREATMENTS:
   1. Control (no manure).
   2. 120 lb/ac. of P<sub>2</sub>O<sub>5</sub> as Super.
   3. Treat. (2)+120 lb/ac. of K<sub>2</sub>O as Pot. Sul.
   4. Treat. (2)+25 lb/ac. of N as A/S.
   5. Treat. (2)+50 lb/ac. of N as A/S.
   6. Treat. (2)+100 lb/ac. of N as A/S.
   7. Treat. (2)+100 lb/ac. of N as A/S.
   8. Fallow (during berseem season).

Manures applied to berseem crop during 1951-52.

3. DESIGN:
   (i) R.B.D. (ii) A. (b) N.A. (iii) 6. (iv) (a) 36'x18', (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948-1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1081 lb/ac.
   (ii) 193.4 lb/ac.
   (iii) Treatment differences are significant.
   (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
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<tr>
<td>4.</td>
<td>1121</td>
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<td>648</td>
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S.E./mean = 78.95 lb/ac.
Crop: Wheat (Rabi).

Object: To study the effect of organic and inorganic phosphatic fertilizers, applied to berseem on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Berseem-Cowpea-Wheat. (b) Cowpea. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 22.11.1952. (iv) (a) 3 ploughings with victory plough, 2 ploughings with steel plough. (b) Sown with monarch drill. (c) 2 md./ac. (d) and (e) N.A. (v) N.A. (vi) C-518. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 10.4.1953 to 13.4.1953.

2. TREATMENTS:
   1. Control (no manure).
   2. F.Y.M. at 16 lb./ac. of P
   3. F.Y.M. at 16 lb./ac. of P
   4. Super at 24 lb./ac. of P
   5. F.Y.M. at 8 lb./ac. of P
   6. Super at 16 lb./ac. of P
   7. Super at 16 lb./ac. of P
   8. F.Y.M. at 8 lb./ac. of P + Super at 24 lb./ac. of P
   9. F.Y.M. at 24 lb./ac. of P + Super at 48 lb./ac. of P
   10. F.Y.M. at 56 lb./ac. of P + Super at 88 lb./ac. of P
   11. F.Y.M. at 8 lb./ac. of P + Super at 24 lb./ac. of P
   12. F.Y.M. at 16 lb./ac. of P
   13. Fallow.

   Manurial treatments applied to berseem.

3. DESIGN:
   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 63" x 115. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1773 lb./ac.
   (ii) 471.5 lb./ac.
   (iii) Treatment differences are highly significant.

   Treatment | Av. yield lb./ac. | Treatment | Av. yield lb./ac.
   1. | 1254 | 7. | 1925
   2. | 1574 | 8. | 1638
   3. | 1720 | 9. | 1702
   4. | 1693 | 10. | 2004
   5. | 1656 | 11. | 2133
   6. | 1923 | 12. | 2069
   7. | 2645 | 13. | 1034

S.E.\_mean = 192.5 lb./ac.

Crop: Wheat (Rabi).

Object: To study the comparative value of various green manuring crops from the point of view of organic matter and plant food ingredients in promoting the yield of subsequent Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13.11.1950. (iv) (a) Tractor grubbing and discing twice. (b) to (e) N.A. (v) Nil. (vi) N.P. 718. (vii) Irrigated. (viii) Hoeing on 10.2.1951. (ix) N.A. (x) 17.4.1951 to 19.4.1951 and 25.4.1951.

2. TREATMENTS:
   Main-plot treatments:
   6 G.M. crops: G<sub>1</sub>=Fallow, G<sub>2</sub>=Guar, G<sub>3</sub>=Sunhemp, G<sub>4</sub>=Cowpea and G<sub>5</sub>=Soyabean, G<sub>6</sub>=Dhaincha.
   Sub-plot treatments:
   2 levels of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>5</sub>=0 and P<sub>6</sub>=80 lb./ac. of P<sub>2</sub>O<sub>5</sub>
   Wheat is grown in all the plots in the subsequent season.

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 64" x 115. (v) N.A. (vi) Yes.
4. GENERAL:

(i) Normal. (ii) Removal of smutted plants on 28.2.1951 and 10.3.1951. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1858 lb./ac.
(ii) (a) 309.0 lb./ac.
(b) 241.2 lb./ac.
(iii) Only G effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
<th>G₀</th>
<th>G₁</th>
<th>G₂</th>
<th>G₃</th>
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<td>2022</td>
<td>2018</td>
<td>1827</td>
<td>1895</td>
<td>1897</td>
<td>1858</td>
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</table>

S.E. of difference of two
1. G marginal means = 126.2 lb./ac.
2. F marginal means = 67.8 lb./ac.
3. P means at the same level of G = 139.2 lb./ac.
4. G means at the same level of P = 160.0 lb./ac.


Object — To study the comparative value of various green manuring crops in point of view of organic matter and from plant food ingredients in promoting the yield of subsequent Wheat crop.

1. BASAL CONDITIONS:

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5, 6.11.1952. (iv) (a) Ploughing with desi plough twice. Preparing land with desi plough twice after soaking. (b) to (e) N.A. (v) N.A. (vi) N.P.718. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 31.3.1952 to 3.4.1953.

2. TREATMENTS:

Main-plot treatments:
6 G.M. crops: G₀=Control (Fallow), G₁=Guar, G₂=Sunhemp, G₃=Cowpea, G₄=Soybean and G₅=Dhaincha.

Sub-plot treatments:
2 levels of P₂O₅ as Super: P₀=0 and P₁=80 lb./ac. of P₂O₅.

3. DESIGN:

(i) Split-plot. (ii) (a) 6 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 64’X114’. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 2002 lb./ac.
(ii) (a) 575.0 lb./ac.
(b) 234.0 lb./ac.
(iii) None of the effects is significant.
I'M

(iv) Av. yield of grain in lb./ac.

<table>
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<th></th>
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<td>2015</td>
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S.E. of difference of two
1. G marginal mean = 235.1 lb./ac.
2. P marginal mean = 76.4 lb./ac.
3. P mean at the same level of G = 187.1 lb./ac.
4. G mean at the same level of P = 269.8 lb./ac.

Crop :- Wheat (Rabi). Ref.:- I.A.R.I. 53(17). Type :- 'M'.

Object :- To study the comparative value of various green manuring crops in point of view of organic matter and from plant food ingredients in promoting the yield of subsequent Wheat crop.

1. BASAL CONDITIONS:
(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 11.11.1953. (iv) (a) 3 discings with the help of disc harrow. 3 ploughings by dist plough followed by sowing every time. (b) to (e) N.A. (v) No. (vi) N.P. 718. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 10, 11.4.1954.

2. TREATMENTS:
Main-plot treatments: 6 G.M. crops: G0=Fallow (control), G1=Gaur, G2=Sannhemp, G3=Cowpea, G4=Soysbean and G5=Dhaincha.
Sub-plot treatments: 2 levels of P0 of Super: P0=0 and P1=80 lb./ac. of P02.
G.M. crops are incorporated in the soil on 28.9.1951.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 1/60 ac. (b) 1/71.5 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1312 lb./ac.
(ii) (a) 152.2 lb./ac. (b) 115.2 lb./ac.
(iii) G effect alone is highly significant.
(iv) Av. yield of grain in lb./ac.

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<tr>
<th></th>
<th>G0</th>
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S.E. of difference of two
1. G marginal mean = 62.14 lb./ac.
2. P marginal mean = 27.15 lb./ac.
3. P mean at the same level of G = 66.65 lb./ac.
4. G mean at the same level of P = 77.95 lb./ac.
Crop :- Wheat (Rabi).
Ref :- I.A.R.I. 52(47). Type :- 'M'.

Object :- To study the effect of Wheat bhussa buried along with artificial manures on the yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Maize—Wheat. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13.11.1952.
   (iv) (a) Ploughing with victory plough and tractor grubbing twice. (b) to (e) N.A. (v) N.A. (vi) N.A.

2. TREATMENTS :
   Main-plot treatments:
   3 levels of bhussa: S₀ = 0, S₁ = 20 and S₂ = 30 md./ac.
   Sub-plot treatments:
   5 doses of manures: M₀ = 0, M₁ = 20 lb./ac. of N, M₂ = 40 lb./ac. of N, M₃ = 60 lb./ac. of N and M₄ =
   16 lb./ac. of N+60 lb./ac. of P₂O₅+40 lb./ac. of K.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a)
   29.0' x 37.5'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi)
   Nil. (vii) Nil.

5. RESULTS:
   (i) 1658 lb./ac.
   (ii) (a) 847.5 lb./ac.
   (b) 395.0 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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</table>

S.E. of difference of two
1. S marginal means = 267.3 lb./ac.
2. M marginal means = 161.2 lb./ac.
3. M means at the same level of S = 279.2 lb./ac.
4. S means at the same level of M = 320.5 lb./ac.

Crop :- Wheat (Rabi).
Ref :- I.A.R.I. 53(48). Type :- 'M'.

Object :- To study the effect of Wheat bhussa buried along with artificial manures on the yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Maize—Wheat. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.11.1953. (iv)
   (a) Dry ploughing with victory and desti plough and land prepared with tractor disc. (b) to (e) N.A. (v)

2. TREATMENTS :
   Main-plot treatments:
   3 levels of bhussa: S₀ = 0, S₁ = 20 and S₂ = 30 md./ac.
   Sub-plot treatments:
   5 doses of manures: M₀ = 0, M₁ = 20 lb./ac. of N, M₂ = 40 lb./ac. of N, M₃ = 60 lb./ac. of N and M₄ =
   16 lb./ac. of N+60 lb./ac. of P₂O₅+40 lb./ac. of K.

Fertilizers in main-plot S₀ were applied on 5.11.1953.
3. DESIGN:
   (i) Split-plot. (ii) 3 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 37.5'×29'. (b) 35.5'×27'. (v) 1' on either side. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1601 lb./ac.
   (ii) (a) 274.0 lb./ac.
   (b) 238.6 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>S₂</td>
<td>1572</td>
<td>1432</td>
<td>1580</td>
<td>1465</td>
<td>1654</td>
<td>1541</td>
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<tr>
<td>Mean</td>
<td>1583</td>
<td>1574</td>
<td>1594</td>
<td>1605</td>
<td>1649</td>
<td>1601</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. S marginal means = 86.4 lb./ac.
2. M marginal means = 97.4 lb./ac.
3. M means at the same level of S = 168.7 lb./ac.
4. S means at the same level of M = 174.0 lb./ac.

---

Crop: Wheat (Rabi).

Ref: I.A.R.I. 52(15).

Type: 'M'.

Object: To study the effect of organic and inorganic manures applied to Wheat.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat—Maize—Peas. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 14.11.1952. (iv) (a) Double discing, single grubbing and double grubbing. (b) to (e) N.A. (v) N.A. (vi) N.P.760. (vii) Irrigated. (viii) Weeding and hand hoeing during 3 and 6.2.1953. (ix) N.A. (x) 3 to 8.4.1953.

2. TREATMENTS:
   1. Control.
   2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅.
   3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.
   4. F.Y.M. at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.
   5. Castor at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.

Organic manures were applied fully to maize in kharif and inorganic manures half to maize in kharif and half to wheat 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' on each side. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes (up to 1956 kharif), (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1745 lb./ac.
   (ii) 330.8 lb./ac.
   (iii) Treatment differences are significant.
Crop :- Wheat (Rahi). Ref :- I.A.R.I. 50(49). Type :- 'M'.

Object :- To find out the optimum dose of N for Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 8. 9.11.1950. (iv) (a) 2 tractor ploughings and 3 discing. (b) Sown by kalra (behind desi plough). (c) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Weeding with khurpi. (ix) N.A. (x) 24.4.1951.

2. TREATMENTS:
   11 levels of N with P and K manures and a control: N₀=0, N₁=10, N₂=20, N₃=30, N₄=40, N₅=50, N₆=60, N₇=70, N₈=80, N₉=90 and N₁₀=100 lb./ac. of N each with 60 lb./ac. of P₂O₅ and 40 lb./ac. of K₂O.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 43'×17'. (b) 41'×15'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Attack of smuts—rouging and burning the affected plants. (iii) Grain yield. (iv) (a) 1949—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2369 lb./ac.
   (ii) 317.7 lb./ac.
   (iii) Treatment differences are significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1582</td>
<td>N₆</td>
<td>2516</td>
</tr>
<tr>
<td>N₁</td>
<td>1800</td>
<td>N₇</td>
<td>2332</td>
</tr>
<tr>
<td>N₂</td>
<td>2143</td>
<td>N₈</td>
<td>3014</td>
</tr>
<tr>
<td>N₃</td>
<td>2281</td>
<td>N₉</td>
<td>3005</td>
</tr>
<tr>
<td>N₄</td>
<td>2533</td>
<td>N₁₀</td>
<td>3019</td>
</tr>
<tr>
<td>N₅</td>
<td>2520</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean=112.3 lb./ac.

Crop :- Wheat (Rahi). Ref :- I.A.R.I. 51(54). Type :- 'M'.

Object :- To find out the optimum dose of N for Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17.11.1951. (iv) (a) Tractor ploughing and grubbing, again tractor grubbing twice. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Rouging on 28.3.1952. (ix) N.A. (x) 19/20.4.1952.
2. TREATMENTS:

11 levels of N with P and K manures and a control: \(N_0 = 0, N_1 = 10, N_2 = 20, N_3 = 30, N_4 = 40, N_5 = 50, N_6 = 60, N_7 = 70, N_8 = 80, N_9 = 90\) and \(N_{10} = 100\) lb./ac. of N each with 60 lb./ac. of \(\text{P}_2\text{O}_5\) and 40 lb./ac. of \(\text{K}_2\text{O}\).

Agrophos and Potash were given before sowing and N was given with 1st irrigation.

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 43'x17'. (b) 41'x15'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1310 lb./ac.

(ii) 292.9 lb./ac.

(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N_0)</td>
<td>1094</td>
<td>(N_6)</td>
<td>1325</td>
</tr>
<tr>
<td>(N_1)</td>
<td>1086</td>
<td>(N_7)</td>
<td>1316</td>
</tr>
<tr>
<td>(N_2)</td>
<td>1135</td>
<td>(N_8)</td>
<td>1316</td>
</tr>
<tr>
<td>(N_3)</td>
<td>1023</td>
<td>(N_9)</td>
<td>1646</td>
</tr>
<tr>
<td>(N_4)</td>
<td>1218</td>
<td>(N_{10})</td>
<td>1489</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-103.6 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Object: To find out the optimum dose of N for Wheat.

1. BASAL CONDITIONS:

(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 12, 13.11.1952. (iv) (a) 1 ploughing with victory plough and 2 by desi plough. Preparing land with desi plough twice. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding once. (ix) N.A. (x) 18.4.1953.

2. TREATMENTS:

11 levels of N with P and K manures and a control: \(N_0 = 0, N_1 = 10, N_2 = 20, N_3 = 30, N_4 = 40, N_5 = 50, N_6 = 60, N_7 = 70, N_8 = 80, N_9 = 90\) and \(N_{10} = 100\) lb./ac. of N each with 60 lb./ac. of \(\text{P}_2\text{O}_5\) and 40 lb./ac. of \(\text{K}_2\text{O}\).

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 17'x39'. (b) 36'x15'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) Rust attack. (iii) Grain yield. (iv) (a) 1949—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 2942 lb./ac.

(ii) 367.9 lb./ac.

(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>N_0</td>
<td>2632 lb./ac.</td>
<td>N_0</td>
<td>2753</td>
</tr>
<tr>
<td>N_1</td>
<td>2713</td>
<td>N_1</td>
<td>2753</td>
</tr>
<tr>
<td>N_2</td>
<td>2914</td>
<td>N_2</td>
<td>2914</td>
</tr>
<tr>
<td>N_3</td>
<td>2793</td>
<td>N_3</td>
<td>2986</td>
</tr>
<tr>
<td>N_4</td>
<td>2986</td>
<td>N_4</td>
<td>3187</td>
</tr>
<tr>
<td>N_5</td>
<td>2906</td>
<td>S.E./mean</td>
<td>112.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop = Wheat (Rabi).  
Ref = I.A.R.I. 53(46).  
Type = 'M'.

Object: To find out the optimum dose of N for Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  
   (ii) (a) and (b) Refer item 11 on page 143.  
   (iii) 9, 10, 10, 1953.  
   (iv) (a) 1 mould board plough one double discing and ploughing.  
   (b) to (c) N.A.  
   (v) N.A.  
   (vi) Irrigated.  
   (vii) Irrigated.  
   (viii) Bakharing and weeding.  
   (ix) N.A.  
   (x) 4.4.1954.

2. TREATMENTS:
   11 levels of N with P and K manures and a control: N_0=0, N_1=10, N_2=20, N_3=30, N_4=40, N_5=50, N_6=60, N_7=70, N_8=80, N_9=90 and N_10=100 lb./ac. of N each with 60 lb./ac. of P_2O_5 and 40 lb./ac. of K_2O.
   N applied as A/S half at sowing and half at the time of 1st irrigation, and P_2O_5 as Super at sowing.
   A/S and Super applied by broadcast on 4, 5, 11.1953.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 12.  
   (b) N.A.  
   (iii) 8.  
   (iv) (a) N.A.  
   (b) 1/60 ac.  
   (v) N.A.  
   (vi) Yes.

4. GENERAL:
   (i) The growth and stand of crop was excellent except in control plots till the crop lodged. Lodging was very marked in highly manured N plots and negligible in low N plots. No lodging in control plots.  
   (ii) Mild attack of brown rust and later on black rust in some plots.  
   (iii) Grain yield.  
   (iv) (a) 1953—N.A.  
   (b) No.  
   (c) N.A.  
   (v) (a) and (b) No.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 2059 lb./ac.  
   (ii) 297.4 lb./ac.  
   (iii) Treatment differences are significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
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<td>N_0</td>
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<tr>
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<td>N_1</td>
<td>2221</td>
</tr>
<tr>
<td>N_2</td>
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<td>2279</td>
</tr>
<tr>
<td>N_3</td>
<td>2039</td>
<td>N_3</td>
<td>2319</td>
</tr>
<tr>
<td>N_4</td>
<td>2106</td>
<td>N_4</td>
<td>2128</td>
</tr>
<tr>
<td>N_5</td>
<td>2125</td>
<td>S.E./mean</td>
<td>112.3 lb./ac.</td>
</tr>
</tbody>
</table>
Object: To study the differential response of three wheat varieties at different levels of fertilizers.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 10.11.1953. (iv) (a) Discing, grubbing, making bunds for irrigation and ploughing with desi plough on 6, 7.11.1953. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Bakharing and weeding. (ix) N.A. (x) 26, 29.4.1954.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as N$_{0} = 0$ lb./ac., N$_{1} = 20$ lb./ac. and N$_{2} = 40$ lb./ac.
   (2) 3 levels of P$_{2}$O$_{5}$ as Super: P$_{0} = 0$ lb./ac., P$_{1} = 20$ lb./ac. and P$_{2} = 40$ lb./ac.
   (3) 3 varieties: V$_{1}$ = Local, V$_{2}$ = N.P. 718 and V$_{3}$ = N.P. 775.

3. DESIGN:
   (i) 3$^2$ confounded factorial. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) One. (iv) (a) 20’$x$54’. (b) 15’$x$48’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. Lodging in April. (ii) Light to medium attack of yellow brown rust and black rust. (iii) Grain yield. (iv) (a) 1953—N.A. (b) N.A. (c) N.A. (v) N.A. (vi) N.A. (vii) No. (viii) The weather during the growing period was normal except the storm in April which caused lodging. (viii) Nil.

5. RESULTS:
   (i) 1640 lb./ac.
   (ii) 1557 lb./ac.
   (iii) None of the effects is significant.
   (iv) Ave. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>P$_{0}$</th>
<th>P$_{1}$</th>
<th>Mean</th>
<th>V$_{1}$</th>
<th>V$_{2}$</th>
<th>V$_{3}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$_{0}$</td>
<td>1214</td>
<td>1748</td>
<td>1809</td>
<td>1590</td>
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<td>N$_{1}$</td>
<td>2041</td>
<td>1668</td>
<td>1688</td>
<td>1799</td>
<td>1567</td>
</tr>
<tr>
<td>N$_{2}$</td>
<td>1555</td>
<td>1718</td>
<td>1517</td>
<td>1530</td>
<td>1305</td>
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<tr>
<td>V$_{1}$</td>
<td>1496</td>
<td>1396</td>
<td>1517</td>
<td>1470</td>
<td></td>
</tr>
<tr>
<td>V$_{2}$</td>
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<td>1728</td>
<td>1950</td>
<td>1748</td>
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<td>V$_{3}$</td>
<td>1547</td>
<td>2010</td>
<td>1547</td>
<td>1701</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 519.0 lb./ac.
S.E. of body of any table = 598.9 lb./ac.

Object: To find out the influence of compost on humus formation and on crop yield.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.11.1952. (iv) (a) Tractor discing and grubbing twice. Preparing land for sowing. (b) to (e) N.A. (v) N.A. (vi) N.P. 760. (vii) Irrigated. (viii) Hand hoeing from 3.2.1953 to 6.2.1953. (ix) N.A. (x) 14, 15.4.1953.
2. TREATMENTS:
All combinations of (1) and (2)+3 levels of N as A/S.
(1) 3 sources of N : S1=Plastered trench compost, S2=Above ground, heap compost and S3=Exposed pit compost.
(2) 3 levels of N : \(M_1=40\), \(M_2=80\) and \(M_3=120\) lb./ac. of N.
3 levels of N as A/S : \(N_0=0\), \(N_1=20\) and \(N_2=40\) lb./ac. of N.
Fertilizers applied on 19.11.1952.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 24.66'x30'. (b) 22.66'x28'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 (kharif)—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS:
(i) 979 lb./ac.
(ii) 336.5 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

\[
N_0=934 \text{ lb./ac.}; N_1=1201 \text{ lb./ac.}; N_2=1654 \text{ lb./ac.}
\]

<table>
<thead>
<tr>
<th></th>
<th>(M_1)</th>
<th>(M_2)</th>
<th>(M_3)</th>
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</tr>
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<tr>
<td>(S_1)</td>
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<td>776</td>
<td>961</td>
<td>874</td>
</tr>
<tr>
<td>(S_2)</td>
<td>975</td>
<td>629</td>
<td>947</td>
<td>854</td>
</tr>
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<tr>
<td>Mean</td>
<td>869</td>
<td>840</td>
<td>940</td>
<td>883</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 79.3 lb./ac.
S.E. of body or N means = 137.4 lb./ac.

Crop :- Wheat (Rabi), Ref :- I.A.R.I. 53(46). Type :- 'M'.

Object :-To study the influence of compost on humus formation and on crop yield.

1. BASAL CONDITIONS :
(i) (a) Maize—Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 24.11.1953.
(iv) (a) Dry victory ploughing, soaking and preparation of land. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Bakharing and weeding. (ix) N.A. (x) 19.4.1954.

2. TREATMENTS :
All combinations of (1) and (2)+3 levels of N as A/S.
(1) 3 sources of N : S1=Plastered trench compost, S2=Above ground, heap compost and S3=Exposed pit compost.
(2) 3 levels of N : \(M_1=40\), \(M_2=80\) and \(M_3=120\) lb./ac. of N.
3 levels of N as A/S : \(N_0=0\), \(N_1=20\) and \(N_2=40\) lb./ac. of N.
Fertilizers applied on 23.11.1953.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 24.5'x30'. (b) 22.66'x28'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 kharif—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.
5. RESULTS:

(i) 1243 lb./ac.
(ii) 294.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

\[ N_1 = 1170 \text{ lb./ac.}; N_2 = 1507 \text{ lb./ac.}; N_3 = 1493 \text{ lb./ac.} \]

<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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</tr>
<tr>
<td>Mean</td>
<td>1156</td>
<td>1202</td>
<td>1224</td>
<td>1194</td>
</tr>
</tbody>
</table>

S.E. any marginal mean = 106.0 lb./ac.
S.E. of body or N mean = 120.3 lb./ac.

Crop: Wheat (Rabi).
Ref.: I.A.R.I. 49(5).
Type: 'M'.

Object: To test the efficiency of different organic manures on Wheat.

1. BASAL CONDITIONS:

(i) (a) No. (b) N.A. (c) N.A. (d) (a) and (b) Refer item II on page 143. (iii) 6.11.1949. (iv) (a) Tractor discing on 4.11.1949. (b) to (e) N.A. (v) Nil. (vi) N.P.165. (vii) Irrigated. (viii) Weeding on 17.1.1950. (ix) N.A. (x) 1st week of April 1949.

2. TREATMENTS:

1. Sanhemp (G.M.) grown in situ.
2. Cowpea (G.M.) grown in situ.
3. Mustard cake at 40 lb./ac. of N.
4. Castor cake at 40 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. Leaf compost at 40 lb./ac. of N.
7. A/S at 40 lb./ac. of N.
8. Control.

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 72' x 36'. (b) 66' x 30'. (v) 3' on each side. (vi) Yes.

4. GENERAL:

(i) G.M. plots have better growth. (ii) Sulphur dusting to check rust. (iii) Grain yield. (iv) (a) 1944 -1949. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1432 lb./ac.
(ii) 259.6 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>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>1192</td>
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<td>3.</td>
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<td>7.</td>
<td>1434</td>
</tr>
<tr>
<td>4.</td>
<td>1316</td>
<td>8.</td>
<td>1148</td>
</tr>
</tbody>
</table>

S.E./mean = 106.0 lb./ac.
Crop: Wheat (Rabi).  
Ref: I.A.R.I. 50(47).  
Type: 'M'.

Object: To test the effect of organic manures and fertilizers on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Wheat on 19.11.1950 and guar on 15.7.1950. (iv) (a) Ploughing, grubbing and discing with tractor. (b) to (e) N.A. (v) N.A. (vi) N.P.760. (vii) Irrigated. (viii) Weeding on 13.2.1951. (ix) 3.46'. (x) 21.4.1951.

2. TREATMENTS:
   Main-plot treatments:
   4 organic manures: M₀=No manure, M₁=Guar as G.M. at 60 lb./ac. of N, M₂=Castor cake at 60 lb./ac. of N and M₃=F.Y.M. at 60 lb./ac. of N.
   Sub-plot treatments:
   5 inorganic manures: T₀=No manure, T₁=A/S at 40 lb./ac. of P₂O₅, T₂=(T₁)+(T₀) and T₃=(T₂)+Pot. Sul. at 60 lb./ac. of K₂O.
   Guar buried on 8.9.1950 and Super, in guar plots, as bone Super, given on 8.9.1950. A/S and Pot. Sul. applied on 16.11.1950. F.Y.M. and Castor cake applied on 15.11.1950 and in their sub-plots, bone Super was given on 24.10.1950, Pot. Sul. and A/S were given on 16.11.1950. In the unmanured main-plot, the fertilizers are applied at sowing time by placement, with desi plough.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 51' x 24'. (b) 49' x 22'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1538 lb./ac.
   (ii) (a) 100.2 lb./ac.
   (b) 33.6 lb./ac.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
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<tr>
<td>1218</td>
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<td>1561</td>
<td>1588</td>
<td>1588</td>
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<tr>
<td>1299</td>
<td>1353</td>
<td>1353</td>
<td>1467</td>
<td>1541</td>
<td>1403</td>
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<tr>
<td>Mean</td>
<td>1415</td>
<td>1457</td>
<td>1534</td>
<td>1583</td>
<td>1702</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means = 25.87 lb./ac.
2. T marginal means = 9.70 lb./ac.
3. T means at the same level of M = 19.40 lb./ac.
4. M means at the same level of T = 31.15 lb./ac.

Crop: Wheat (Rabi).  
Ref: I.A.R.I. 52(50).  
Type: 'M'.

Object: To test the effect of organic manures and fertilizers on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize—Wheat. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Guar on 2.7.1952 and wheat on 7, 10.11.1952. (iv) (a) Ploughing with victory and desi plough, discing and beaming. (b) to (e) N.A. (v) N.A. (vi) N.P.760. (vii) Irrigated. (viii) Weeding on 15.8.1953. (ix) 15.81'. (x) 21.4.1953.
2. TREATMENTS:

Main-plot treatments:
4 organic manures: \( M_0 = \) No manure, \( M_1 = \) Guar as G.M. at 60 lb./ac. of N, \( M_2 = \) Castor cake at 60 lb./ac. of N and \( M_3 = \) F.Y.M. at 60 lb./ac. of N.

Sub-plot treatments:
5 inorganic manures: \( T_0 = \) No manure, \( T_1 = \) A/S at 40 lb./ac. of N, \( T_2 = \) Super at 80 lb./ac. of P\(_2\)O\(_5\), \( T_3 = (T_1) + (T_2) \) and \( T_4 = (T_3) + \) Pot. Sul. at 60 lb./ac. of K\(_2\)O.

To Guar plots Super was given at sowing time on 2.7.1952, F.Y.M. during 26 to 30.9.1952 and castor cake on 5.11.1952. A/S and Pot. Sul. to manured main-plots on 4.11.1952. Fertilizers to unmanured main-plots at sowing time during 7 to 10.11.1952.

3. DESIGN:
(i) Split-plot.
(ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 51'x24'. (b) 48'x21'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1959—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th></th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>( T_4 )</th>
<th>Mean</th>
</tr>
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<tr>
<td>( M_0 )</td>
<td>1154</td>
<td>1487</td>
<td>994</td>
<td>1582</td>
<td>1392</td>
<td>1322</td>
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<tr>
<td>( M_1 )</td>
<td>1400</td>
<td>1590</td>
<td>1534</td>
<td>1629</td>
<td>1668</td>
<td>1564</td>
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<tr>
<td>( M_2 )</td>
<td>1275</td>
<td>1598</td>
<td>1361</td>
<td>1465</td>
<td>1571</td>
<td>1455</td>
</tr>
<tr>
<td>( M_3 )</td>
<td>1106</td>
<td>1469</td>
<td>1137</td>
<td>1452</td>
<td>1478</td>
<td>1328</td>
</tr>
<tr>
<td>Mean</td>
<td>1234</td>
<td>1536</td>
<td>1256</td>
<td>1532</td>
<td>1529</td>
<td>1417</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. \( M \) marginal means = 78.77 lb./ac.
2. \( T \) marginal means = 47.71 lb./ac.
3. \( T \) means at the same level of \( M \) = 95.42 lb./ac.
4. \( M \) means at the same level of \( T \) = 116.20 lb./ac.

---

Crop: Wheat (Rabi). 
Ref: I.A.R.I. 53(52). Type: 'M'.

Object: To test the effect of organic manures and fertilizers on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Wheat-Maize-Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 15.11.1953.
(iv) (a) Discing with tractor twice, ploughing with derf plough and beaming. (b) to (e) N.A. (v) N.A.
(vi) N.P. 760. (vii) Irrigated. (viii) Weeding. (ix) 5.30'. (a) N.A.

TREATMENTS:
Main-plot treatments:
4 organic manures: \( M_0 = \) No manure, \( M_1 = \) Guar as G.M. at 60 lb./ac. of N, \( M_2 = \) Castor cake at 60 lb./ac. of N and \( M_3 = \) F.Y.M. at 60 lb./ac. of N.

Sub-plot treatments:
5 inorganic manures: \( T_0 = \) No manure, \( T_1 = \) A/S at 40 lb./ac. of N, \( T_2 = \) Super at 80 lb./ac. of P\(_2\)O\(_5\), \( T_3 = (T_1) + (T_2) \) and \( T_4 = (T_3) + \) Pot. Sul. at 60 lb./ac. of K\(_2\)O.
2. **DESIGN:**
   (i) Split-plot. (ii) (a) 4 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 31' x 24'. (b) 48' x 21'. (v) N.A. (vi) Yes.

3. **GENERAL:**
   (i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 – N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

4. **RESULTS:**
   (i) 352.9 lb./ac.
   (ii) (a) 240.3 lb./ac.
   (b) 259.2 lb./ac.
   (iii) None of the effects 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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<td>325.9</td>
<td>290.5</td>
<td>289.6</td>
<td>297.9</td>
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<td>445.5</td>
<td>385.1</td>
<td>409.0</td>
<td>408.0</td>
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<td>314.3</td>
<td>360.4</td>
<td>313.5</td>
<td>335.0</td>
<td>381.0</td>
</tr>
<tr>
<td>M₃</td>
<td>353.0</td>
<td>383.5</td>
<td>361.2</td>
<td>363.3</td>
<td>369.5</td>
</tr>
<tr>
<td>Mean</td>
<td>329.8</td>
<td>378.3</td>
<td>337.6</td>
<td>354.2</td>
<td>364.4</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means = 62.04 lb./ac.
2. T marginal means = 74.82 lb./ac.
3. T means at the same level of M = 149.64 lb./ac.
4. M means at the same level of T = 147.53 lb./ac.

---

**Crop:** Wheat (Rabi).

**Ref:** I.A.R.I. 51(27).

**Type:** 'M'.

Object:—To study the effect of soyabean grown for grain, fodder and G.M. on the yield of Wheat.

1. **BASAL CONDITIONS:**
   (i) (a) Soyabean-Wheat. (b) Soyabean. (p) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2,11.1951. (iv) (a) Ploughing with desi plough twice. (b) to (e) N.A. (v) Nil. (vi) N.P. 775. (vii) Irrigated. (viii) Hooning with oudh plough. (ix) N.A. (x) 22.3.1952.

2. **TREATMENTS:**
   1. Soyabean for grain—Wheat.
   2. Soyabean for fodder—Wheat.

3. **DESIGN:**
   (i) B.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 1375 lb./ac.
   (ii) 254.8 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>1.</td>
<td>823</td>
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<tr>
<td>2.</td>
<td>1385</td>
</tr>
<tr>
<td>3.</td>
<td>1405</td>
</tr>
<tr>
<td>4.</td>
<td>1887</td>
</tr>
</tbody>
</table>

S.E./mean = 127.4 lb./ac.
Crop: Wheat (Rabi).

Object: To study the effect of soyabean grown for grain, fodder and G.M. on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Soyabean—Wheat. (b) Soyabean. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.12.1952. (iv) (a) Floughing with desi plough twice. (b) to (e) N.A. (v) N.A. (vi) N.P. 775. (vii) Irrigated. (viii) Rowing once. (ix) N.A. (x) 5-4-1953.

2. TREATMENTS:
   1. Soyabean for grain—Wheat.
   2. Soyabean for fodder—Wheat.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1329 lb./ac.
   (ii) 134.9 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of grain in lb./ac.
   Treatment       Av. yield
   1.               883
   2.               1103
   3.               1605
   4.               1726
   S.E./mean      67.5 lb./ac.

Crop: Wheat (Rabi).

Object: To study the effect of soyabean grown for grain, fodder and G.M. on yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Soyabean—Wheat. (b) Soyabean. (c) Super at 85 lb./ac. of P₂O₅. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.11.1953. (iv) (a) Ploughing by victory plough once, with desi plough twice. (b) N.A. (c) 1 md./ac. (d) and (e) N.A. (v) Nil. (vi) N.P. 775. (vii) Irrigated. (viii) Buthuring. (ix) N.A. (x) 4 to 8.4.1953.

2. TREATMENTS:
   1. Soyabean for grain—Wheat.
   2. Soyabean for fodder—Wheat.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Attack of smuts. (iii) Yield of fodder. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS:
   (i) 0.48 ton/ac.
   (ii) 0.025 ton/ac.
   (iii) Treatment differences are highly significant.
(iv) Av. yield of fodder in ton/acre.

<table>
<thead>
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<th>Treatment</th>
<th>Av. yield</th>
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<tbody>
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<td>2.</td>
<td>0.46</td>
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<td>3.</td>
<td>0.53</td>
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<tr>
<td>4.</td>
<td>0.61</td>
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</tbody>
</table>

S.E./mean = 0.03 ton/acre.

Crop : Wheat (Rabi).

Ref : I.A.R.I. 48(18).

Type : 'M'.

Object : To study the response of phosphatic manuring of berseem and its residual effect on Wheat after taking maize crop.

1. BASAL CONDITIONS:
   (i) (a) Berseem—Maize—Wheat. (b) Maize. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1948. (iv) (a) 4 discings. (b) to (e) N.A. (v) F.Y.M. at 10 ton/acre. (vi) C.518. (vii) Irrigated. (viii) Lever harrow on 21.12.1948. (ix) 0.94'. (x) 19 to 22.4.1949.

2. TREATMENTS:
   1. No manure.
   2. B.M. at 120 lb./acre of P<sub>2</sub>O<sub>5</sub>.
   3. Ammo. Phos. at 120 lb./acre of P<sub>2</sub>O<sub>5</sub>.
   4. Super at 120 lb./acre of P<sub>2</sub>O<sub>5</sub>.
   5. B.M. at 60 lb./acre of P<sub>2</sub>O<sub>5</sub> + Ammo. Phos. at 60 lb./acre of P<sub>2</sub>O<sub>5</sub>.
   6. B.M. at 60 lb./acre of P<sub>2</sub>O<sub>5</sub> + Super at 60 lb./acre of P<sub>2</sub>O<sub>5</sub>.

Treatments are given to berseem during 1947.

3. DESIGN:
   (i) Randomised Block Design. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 15.5' x 33'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1948. (b) and (c) N.A. (v) (a) and (b) Nil, (vi) and (vii) Nil.

5. RESULTS:
   (i) 2683 lb./acre.
   (ii) 275.6 lb./acre.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of grain in lb./acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
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<td>2744</td>
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<td>4.</td>
<td>2564</td>
</tr>
<tr>
<td>5.</td>
<td>2732</td>
</tr>
</tbody>
</table>

S.E./mean = 159.1 lb./acre.

Crop : Wheat (Rabi).

Ref : I.A.R.I. 48(14).

Type : 'M'.

Object : To study the effect of phosphatic manuring of berseem without any basal manure.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1948. (iv) (a) Discings 4 times. (b) to (e) N.A. (v) Nil. (vi) C.318. (vii) Irrigated. (viii) Lever harrow on 21.12.1948. (ix) 0.94'. (x) 22.4.1949 and 2.5.1949.
2. TREATMENTS:
1. No manure.
2. B.M. at 120 lb./ac. of P₂O₅.
3. Ammo. Phos. at 120 lb./ac. of P₂O₅.
4. Super at 120 lb./ac. of P₂O₅.
5. B.M. at 60 lb./ac. of P₂O₅+Ammo. Phos. at 60 lb./ac. of P₂O₅.
6. B.M. at 60 lb./ac. of P₂O₅+Super at 60 lb./ac. of P₂O₅.

Treatments applied last year.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 16.5' x 33'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Mild attack of brown rust. (iii) Grain yield. (iv) (a) 1944—1948. (b) and (c) N.A.
(v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1934 lb./ac.
(ii) 181.9 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
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</thead>
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<td>2.</td>
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<td>4.</td>
<td>1844</td>
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<tr>
<td>5.</td>
<td>2097</td>
</tr>
<tr>
<td>6.</td>
<td>1793</td>
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<tr>
<td>S.E.(mean)</td>
<td>104.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi). Ref :- I.A.R.I. 48(4). Type :- 'M'.

Object :- To study the residual effect of phosphatic manures on berseem and then on Wheat.

1. BASAL CONDITIONS:
(i) (a) Berseem-Guar-Wheat-Guar-Wheat. (b) Guar. (c) N.A. (ii) (a) and (b) Refer item 11 on page 141.
(iii) 19.11.1948. (iv) (a) Discing 4 times and grubbing once. (b) to (e) N.A. (v) Nil. (vi) C-518. (vii) Irrigated.
(viii) N.A. (ix) 1.4+2. (x) 27.4.1949.

2. TREATMENTS:
1. No manure.
2. Super at 60 lb./ac. of P₂O₅.
3. Super at 120 lb./ac. of P₂O₅.
4. (2)+80 lb./ac. of K₂O.
5. (3)+80 lb./ac. of K₂O.
6. (4)+A/S at 30 lb./ac. of N.

Treatments applied to berseem in 1946.

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 58' x 25'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Attack of orange rust. (iii) Grain yield. (iv) (a) 1946—1948. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1750 lb./ac.
(ii) 329.9 lb./ac.
(iii) Treatment differences are not significant.
Object: To study the effect of phosphatic manuring on berseem and its residual effect on Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.11.1948. (iv) (a) to (e) N.A. (v) N.A. (vi) C.518. (vii) Irrigated. (viii) N.A. (ix) 0.94. (x) 24.4.1949.

2. TREATMENTS:

1. No manure.
2. Super at 60 lb./ac. of P2O5.
3. Super at 120 lb./ac. of P2O5.
4. (2)+80 lb./ac. of K2O.
5. (3)+80 lb./ac. of K2O.
6. (4)+A/S at 30 lb./ac. of N.
7. (5)+A/S at 30 lb./ac. of N.
8. (2)+A/S at 30 lb./ac. of N.
9. (3)+A/S at 30 lb./ac. of N.
10. (2)+F.Y.M. at 30 lb./ac. of P2O5.
11. (3)+F.Y.M. at 60 lb./ac. of P2O5.

Treatments applied to Berseem in 1946.

3. DESIGN:

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 38'x25'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Attack of rust. (iii) Grain yield. (iv) (a) 1946—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1855 lb./ac.
(ii) 330.5 lb./ac.
(iii) Treatment differences are significant.

(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1486</td>
<td>7.</td>
<td>1767</td>
</tr>
<tr>
<td>2.</td>
<td>1656</td>
<td>8.</td>
<td>1987</td>
</tr>
<tr>
<td>3.</td>
<td>1972</td>
<td>9.</td>
<td>1624</td>
</tr>
<tr>
<td>4.</td>
<td>2242</td>
<td>10.</td>
<td>1892</td>
</tr>
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<td>5.</td>
<td>1759</td>
<td>11.</td>
<td>1995</td>
</tr>
<tr>
<td>6.</td>
<td>2030</td>
<td>S.E./mean</td>
<td>143.1 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi).  Ref: I.A.R.I. 48(3).  Type: 'M'.

Object: To build up soil fertility through phosphatic manuring of berseem in Berseem—Guar—Wheat rotation.

1. BASAL CONDITIONS:

(i) (a) Berseem—Guar—Wheat. (b) Guar. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) C.518. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:

1. No manure.
2. Super at 60 lb./ac. of P2O5.
3. Super at 120 lb./ac. of P2O5.
4. Super at 60 lb./ac. of P_{2}O_{5}+80 lb./ac. of K_{2}O.
5. Super at 120 lb./ac. of P_{2}O_{5}+80 lb./ac. of K_{2}O.
6. Super at 120 lb./ac. of P_{2}O_{5}+80 lb./ac. of K_{2}O+A/S 30 lb./ac. of N.
7. Super at 60 lb./ac. of P_{2}O_{5}+80 lb./ac. of K_{2}O+A/S 30 lb./ac. of N.
8. Super at 60 lb./ac. of P_{2}O_{5}+A/S at 30 lb./ac. of N.
9. Super at 120 lb./ac. of P_{2}O_{5}+A/S at 30 lb./ac. of N.
10. Super at 30 lb./ac. of P_{2}O_{5}+F.Y.M. at 30 lb./ac. of P_{2}O_{5}.
11. Super at 60 lb./ac. of P_{2}O_{5}+F.Y.M. at 60 lb./ac. of P_{2}O_{5}.

3. DESIGN:
   (i) R.B.D. (ii) (a) N.A. (iii) 6. (iv) (a) 50'×25'. (b) N.A. (v) N.A. (vi) Yes

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) No. of tillers per plant. (iv) (a) 1946—1948. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS:
   (i) 4.44 tillers/plot.
   (ii) 1.12 tillers/plot.
   (iii) Treatment differences are not significant.
   (iv) Av. no. of tillers per plant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. no. of tillers</th>
<th>Treatment</th>
<th>Av. no. of tillers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>4.3</td>
<td>7.</td>
<td>3.9</td>
</tr>
<tr>
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<td>4.2</td>
<td>8.</td>
<td>4.8</td>
</tr>
<tr>
<td>3.</td>
<td>4.3</td>
<td>9.</td>
<td>5.2</td>
</tr>
<tr>
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<td>10.</td>
<td>4.0</td>
</tr>
<tr>
<td>5.</td>
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<td>11.</td>
<td>4.3</td>
</tr>
<tr>
<td>6.</td>
<td>4.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   S.E./mean =0.46 tillers/plot.

Crop: Wheat (Rabi).  
Type = 'M'.

Object:—To build up soil fertility through phosphatic manuring of berseem in rotation.

1. BASAL CONDITIONS:
   (i) (a) Bzersoom—Guar—Wheat. (b) Guar. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) C. 515. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. No manure.
   2. Super at 60 lb./ac. of P_{2}O_{5}.
   3. Super at 120 lb./ac. of P_{2}O_{5}.
   4. Super at 60 lb./ac. of P_{2}O_{5}+Pot. Sulph at 80 lb./ac. of K_{2}O.
   5. Super at 120 lb./ac. of P_{2}O_{5}+Pot. Sulph at 80 lb./ac. of K_{2}O.
   6. Super at 60 lb./ac. of P_{2}O_{5}+Pot. Sulph at 80 lb./ac.+A/S at 30 lb./ac. of N.
   7. Super at 120 lb./ac. of P_{2}O_{5}+Pot. Sulph at 80 lb./ac.+A/S at 30 lb./ac. of N.
   8. Super at 60 lb./ac. of P_{2}O_{5}+A/S at 30 lb./ac. of N.
   9. Super at 120 lb./ac. of P_{2}O_{5}+A/S at 30 lb./ac. of N.
   10. Super at 30 lb./ac. of P_{2}O_{5}+F.Y.M. at 30 lb./ac. of P_{2}O_{5}.
   11. Super at 60 lb./ac. of P_{2}O_{5}+F.Y.M. at 60 lb./ac. of P_{2}O_{5}.

3. DESIGN:
   (i) R.B.D. (ii) (a) N.A. (iii) 6. (iv) 50'×25'. (b) N.A. (v) N.A. (vi) Yes

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Number of tillers per plant. (iv) (a) 1946—1948. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 5.2 tillers/plot.
   (ii) 1.37 tillers/plot.
   (iii) Treatment differences are not significant.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. no. of tillers</th>
<th>Treatment</th>
<th>Av. no. of tillers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>4.9</td>
<td>7.</td>
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</tr>
<tr>
<td>2.</td>
<td>5.7</td>
<td>8.</td>
<td>4.5</td>
</tr>
<tr>
<td>3.</td>
<td>4.9</td>
<td>9.</td>
<td>5.5</td>
</tr>
<tr>
<td>4.</td>
<td>4.4</td>
<td>10.</td>
<td>4.9</td>
</tr>
<tr>
<td>5.</td>
<td>5.2</td>
<td>11.</td>
<td>5.5</td>
</tr>
<tr>
<td>6.</td>
<td>6.2</td>
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<td></td>
</tr>
</tbody>
</table>

S.E./mean = 0.56 tillers/plot.

Crop: Wheat (Rabi).  
Ref: I.A.R.I. 49(6).  
Type: 'M'.

Object:—To build up soil fertility through phosphatic manuring of berseem in rotation.

1. BASAL CONDITIONS:
   (i) (a) B. ceem-Guar-Wheat. (b) Guar. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A.
   (iv) (a) to (e) N.A. (v) N.A. (vi) C-518. (vii) to (x) N.A.

2. TREATMENTS:
   1. Control.
   2. 60 lb./ac. of P2O5 as Super.
   3. 120 lb./ac. of P2O5 as Super.
   4. Treatment (2)+80 lb./ac. of K2O as Pot. Sul.
   5. Treatment (3)+80 lb./ac. of K2O as Pot. Sul.
   6. Treatment (4)+30 lb./ac. of N as A/S.
   7. Treatment (5)+30 lb./ac. of N as A/S.
   8. Treatment (2)+30 lb./ac. of N as A/S.
   9. Treatment (3)+30 lb./ac. of N as A/S.
   10. 30 lb./ac. of P2O5 as Super+30 lb./ac. of P2O5 as F.Y.M.
   11. Treatment (2)+60 lb./ac. of P2O5 as F.Y.M.

3. DESIGN:
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 5'×25'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) No. of tillers per plant. (iv) (a) 1946—1949. (b) Yes. (c) N.A. (v) (a) and (b)
   No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 4.33 tillers/plant.
   (ii) 3.41 tillers/plant.
   (iii) Treatment differences are not significant.
   (iv) Av. number of tiller per plant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. no. of tillers</th>
<th>Treatment</th>
<th>Av. no. of tillers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>4.6</td>
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<td>2.</td>
<td>4.1</td>
<td>8.</td>
<td>4.4</td>
</tr>
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<td>3.</td>
<td>3.9</td>
<td>9.</td>
<td>5.4</td>
</tr>
<tr>
<td>4.</td>
<td>3.9</td>
<td>10.</td>
<td>3.9</td>
</tr>
<tr>
<td>5.</td>
<td>4.9</td>
<td>11.</td>
<td>3.9</td>
</tr>
<tr>
<td>6.</td>
<td>4.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 1.39 tillers/plant.

Crop: Wheat (Rabi).  
Ref: I.A.R.I. 48(12).  
Type: 'M'.

Object:—To study the effect of phosphatic manuring of berseem on Wheat, with sanbemp as basal dressing.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Maize. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1948.
   (iv) (a) 3 discings and grubbing. (b) to (e) N.A. (v) Sanbemp as G.M. (vi) C-518. (vii) Irrigated.
   (viii) Lever harrow worked on 17.12.1948. (ix) 0.94'. (x) 30.4.1949.
2. TREATMENTS:
   1. No manure.
   2. B.M. at 120 lb./ac. of P_2O_5.
   3. Amm. Phos. at 120 lb./ac. of P_2O_5.
   4. Super at 120 lb./ac. of P_2O_5.
   5. B.M. at 60 lb./ac. of P_2O_5 + Amm. Phos. at 60 lb./ac. of P_2O_5.
   6. B.M. at 60 lb./ac. of P_2O_5 + Super at 60 lb./ac. of P_2O_5.

   Treatments were given to berseem in 1947-1948.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 16.5'x35'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Poor at several places due to lack of moisture. (ii) Nil. (iii) Grain yield. (iv) (a) 1944-1948. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1896 lb./ac.
   (ii) 401.5 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>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2021</td>
</tr>
<tr>
<td>2.</td>
<td>1725</td>
</tr>
<tr>
<td>3.</td>
<td>2121</td>
</tr>
<tr>
<td>4.</td>
<td>1814</td>
</tr>
<tr>
<td>5.</td>
<td>2018</td>
</tr>
<tr>
<td>6.</td>
<td>1680</td>
</tr>
</tbody>
</table>

   S.E./mean = 231.8 lb./ac.


Object: - To find out suitable manure mixture for Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item II on page 143. (iii) 21.11.1953. (iv) (a) Ploughing with victory plough once. Preparing land with desi plough twice. (b) to (e) N.A. (v) N.A. (vi) N.P. 761. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. 50 lb./ac. of A/S + 140 lb./ac. of G.N.C.
   2. 50 lb./ac. of A/S + 364 lb./ac. of G.N.C.
   3. 70 lb./ac. of Amm. Phos. + 364 lb./ac. of G.N.C.
   4. 100 lb./ac. of A/S + 280 lb./ac. of G.N.C. + 875 lb./ac. of Super.
   5. 50 lb./ac. of A/S + 140 lb./ac. of G.N.C. + 44 lb./ac. of Super.
   6. 100 lb./ac. of A/S + 280 lb./ac. of G.N.C. + 140 lb./ac. of Super.
   7. 70 lb./ac. of Amm. Phos. + 196 lb./ac. of G.N.C. + 40 lb./ac. of Super.
   8. 100 lb./ac. of A/S + 50 lb./ac. of triple Super.
   9. 200 lb./ac. of A/S + 100 lb./ac. of triple Super.
   10. 100 lb./ac. of A/S.
   11. 200 lb./ac. of A/S.
   12. Control.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 acre. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953 - N.A. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.
5. RESULTS:
(i) 1687 lb./ac.
(ii) 210.6 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<td>1662</td>
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<td>9.</td>
<td>1563</td>
</tr>
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<td>4.</td>
<td>1712</td>
<td>10.</td>
<td>1761</td>
</tr>
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<td>1712</td>
<td>11.</td>
<td>1701</td>
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<tr>
<td>6.</td>
<td>1712</td>
<td>12.</td>
<td>1563</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-105.3 lb./ac.</td>
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</tbody>
</table>

Crop :- Wheat (Rabi).  Ref :- I.A.R.I. 53(27).  Type :- 'M'.

Object :- To study optimum time of the application of fertilizers to Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Fallow.  (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 17.11.1953.  (iv) (a) Ploughing with victory plough, disced twice, levelling, ploughing and harrowing.  (b) Sown with seed drill.
   (c) to (e) N.A.  (v) No.  (vi) N.P. 710.  (vii) Irrigated.  (viii) Bakharing and weeding.  (ix) N.A.  (x) 16.4.1954.

2. TREATMENTS:
   All combinations of (1) and (2)+ a control.
   (1) 2 times of application: T1 = At time of sowing.  T2 = At the time of first irrigation.
   (2) 3 sources of N: S1 = A/S.  S2 = Ammon.  Nitrate and S3 = Urea.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) N.A.  (iii) 4.  (iv) 22'x49.5'.  (b) 1/60 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Severe lodging.  (ii) Mild rust attack on border plants, earheads damaged by rats.  (iii) Grain yield.
   (iv) (a) 1953—1954.  (b) No.  (c) N.A.  (v) (a).  (b) No.  (vi) The wind storm on 19.2.1954 caused severe lodging.  (vii) Nil.

5. RESULTS:
   (i) 1500 lb./ac.
   (ii) 68.64 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>Mean</th>
</tr>
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<tr>
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<td>1379</td>
<td>1528</td>
<td>1491</td>
</tr>
<tr>
<td>T2</td>
<td>1594</td>
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<td>1558</td>
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</tr>
<tr>
<td>Mean</td>
<td>1591</td>
<td>1423</td>
<td>1543</td>
<td>1519</td>
</tr>
</tbody>
</table>

S.E. of S marginal means = 24.27 lb./ac.
S.E. of T marginal means = 19.82 lb./ac.
S.E. of body of table or control mean = 34.32 lb./ac.
Crop: Wheat (Rabi).
Object: To study the optimum time of application of fertilizers to Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17.11.1950. (iv) (a) Tractor grubbing and discing twice. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 25.4.1951.

2. TREATMENTS:
   All combinations of (1) and (2) + a control.
   (1) 4 sources of N: \( S_1 = A/S, S_2 = A/S/N, S_3 = C/N \) and \( S_4 = \text{Urea} \).
   (2) 3 times of application of N: \( T_1 \) = At sowing, \( T_2 \) = At 1st irrigation and \( T_3 \) = At 2nd irrigation.

3. DESIGN:
   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 34'x15'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Sulphur dusting against rust on 5.2.1951 and 20.2.1951. (iii) Grain yield. (iv) (a) 1950—N.A. (b) N.A. (c) N.A. (d) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1298 lb./ac.
   (ii) 312.0 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control =1088 lb./ac.</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>1350</td>
</tr>
<tr>
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<td>1510</td>
<td>1240</td>
<td>1383</td>
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<tr>
<td>( S_4 )</td>
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<td>1380</td>
<td>1260</td>
<td>1283</td>
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</tbody>
</table>

S.E. of T marginal mean = 78.0 lb./ac.
S.E. of S marginal mean = 90.1 lb./ac.
S.E. of body of table = 156.0 lb./ac.

Crop: Wheat (Rabi).
Object: To study the residual effect of fertilizers added to wheat crops on the yield of Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 9.11.1951. (iv) (a) Tractor ploughing, discing and ploughing with desi plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2), (3) and (4)
   (1) 3 levels of N as A/S: \( N_0 = 0, N_1 = 20 \) and \( N_2 = 40 \) lb./ac. of N.
   (2) 3 levels of P\(_2\)O\(_5\) as Super: \( P_0 = 0, P_1 = 80 \) and \( P_2 = 160 \) lb./ac. of P\(_2\)O\(_5\).
   (3) 3 levels of K\(_2\)O as Pot. Sol.: \( K_0 = 0, K_1 = 80 \) and \( K_2 = 160 \) lb./ac. of K\(_2\)O.
   (4) 3 levels of lime: \( L_0 = \text{No lime}, L_1 = \text{Lime at 5 mds./ac.} \) and \( L_2 = \text{Lime at 10 mds./ac.} \)

C/N was added to \( N_1 \) and \( N_2 \) plots on 31st December and 3rd, 4th January along with irrigation. Fertilizers added to 5 successive crops.
3. DESIGN:
(i) 3rd confounding. (ii) (a) 9 plots/block and 9 blocks/replications. (b) N.A. (iii) 2. (iv) (a) 23"×25'.3". (b) 25'×23'.3". (v) 1'4" around. (vi) Yes.

4. GENERAL:
(i) Excellent growth. Lodging first took place during March 1952. (ii) N.A. (iii) Grain yield. (iv) (a) 1945 - N.A. (b) N.A. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A. Therefore two way tables could not be prepared.

5. RESULTS:
(i) 925.5 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac. Treatment Treatment Av. yield

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>824</td>
</tr>
<tr>
<td>N1</td>
<td>936</td>
</tr>
<tr>
<td>N2</td>
<td>1017</td>
</tr>
<tr>
<td>N3</td>
<td>771</td>
</tr>
<tr>
<td>N4</td>
<td>890</td>
</tr>
<tr>
<td>N5</td>
<td>1115</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=N.A.</td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi). Ref :- I.A.R.I. 51(80). Type :- 'M'.

Object :-To study the effect of P on the yield of berseem and its residual effect on cowpea yield and also to study the residual effect on Wheat after berseem-cowpea and berseem-fallow rotation.

1. BASAL CONDITIONS:
(i) Berseem-Cowpea-Wheat. (b) Cowpea. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.12.1951. (iv) (a) Four ploughings by desi plough each followed by harrowing done after palowa. (b) Monarch drill. (c) 5 mds./ac. (d) and (e) N.A. (v) N.A. (vi) C-518. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 17,18.4.1952.

2. TREATMENTS:
Main-plot treatments:
13 manurial treatments: M₀=0, M₁=F.Y.M., at 16 lb./ac. of P₅O₅, M₂=F.Y.M. at 32 lb./ac. of P₂O₅, M₃=F.Y.M. at 64 lb./ac. of P₂O₅, M₄=Super at 16 lb./ac. of P₂O₅, M₅=Super at 32 lb./ac. of P₂O₅, M₆=Super at 64 lb./ac. of P₂O₅, M₇=Super at 8 lb./ac. of P₂O₅+F.Y.M. at 8 lb./ac. of P₂O₅, M₈=Super at 16 lb./ac. of P₂O₅+F.Y.M. at 16 lb./ac. of P₂O₅, M₉=Super at 32 lb./ac. of P₂O₅+F.Y.M. at 32 lb./ac. of P₂O₅, M₁₀=Super at 64 lb./ac. of P₂O₅+F.Y.M. at 64 lb./ac. of P₂O₅, M₁₁=Super at 8 lb./ac. of P₂O₅+F.Y.M. at 8 lb./ac. of P₂O₅, M₁₂=Super at 16 lb./ac. of P₂O₅+F.Y.M. at 16 lb./ac. of P₂O₅, M₁₃=Super at 32 lb./ac. of P₂O₅+F.Y.M. at 32 lb./ac. of P₂O₅, M₁₄=Super at 64 lb./ac. of P₂O₅+F.Y.M. at 64 lb./ac. of P₂O₅, M₁₅=Super at 8 lb./ac. of P₂O₅+F.Y.M. at 8 lb./ac. of P₂O₅.

Sub-plot treatments:
2 rotations: T₁=Cowpea-Wheat and T₂=Fallow-Wheat. Manural treatments applied to berseem crop.

3. DESIGN:
(i) Split-plot. (ii) (a) 13 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 63'×15'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Slight infection of wheat smut. (iii) Grain yield. (iv) (a) N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Hail-storm occurred on 1.3.1952. (vii) Nil.

5. RESULTS:
(i) 1338 lb./ac.
(ii) (a) 209.5 lb./ac.
(b) 152.1 lb./ac.
(iii) Only T effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield after cowpea</th>
<th>Av. yield after fallow</th>
</tr>
</thead>
<tbody>
<tr>
<td>After cowpea, after fallow</td>
<td>1219 1429 1670 1549 1650 1646 1459</td>
<td>18.38 17.98 23.07 21.36 18.80 21.47 20.18</td>
</tr>
<tr>
<td>After fallow</td>
<td>1467</td>
<td>16.94</td>
</tr>
</tbody>
</table>

S.E./mean (after cowpea) = 159.6 lb./ac.
S.E./mean (after fallow) = 2.04 lb./ac.
Crop: Wheat (Rabi).  
Ref: I.A.R.I. 53(79).  
Type: 'M'.

Object: To study the effect of method of application of different \( \text{P}_2\text{O}_5 \) fertilizers on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Sugarcane. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.11.1953. (iv) (a) Victory ploughing, tractor ploughing, discsing and twice ploughing with desi plough. (b) to (e) N.A. (v) N.A. (vi) N.P. 719. (vii) Irrigated. (viii) Weeding and bhikhiara. (ix) N.A. (x) 24-4-1954.

2. TREATMENTS:
   All combinations of (1), (2) and (3) and two control (no manure) plots.
   (1) 3 sources of \( \text{P}_2\text{O}_5 \): \( S_1 = \text{Super} \), \( S_2 = \text{Nitro. Phos.} \) and \( S_3 = \text{Ammo. Phos.} \).
   (2) 2 levels of \( \text{P}_1 \): \( P_1 = 15 \) lb./ac. and \( P_2 = 30 \) lb./ac. of \( \text{P}_2\text{O}_5 \).
   (3) 2 methods of placement: \( M_1 = \text{By broadcast before final cultivation and } M_2 = 2\frac{1}{4} \) below seed.

   \( \text{P}_2\text{O}_5 \) broadcast on 25, 26.11.1953 and place at depth on 27.11.1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) 23'x47'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) The plants, at later stage, were slightly affected by black stem-rust. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1566 lb./ac.
   (ii) 2123 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>Mean</th>
<th>M_1</th>
<th>M_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1552</td>
<td>1585</td>
<td>1582</td>
<td>1573</td>
<td>1563</td>
<td>1583</td>
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<tr>
<td>1990</td>
<td>1416</td>
<td>1570</td>
<td>1525</td>
<td>1420</td>
<td>1631</td>
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<td>1549</td>
<td>1491</td>
<td>1607</td>
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<td>1443</td>
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<td></td>
</tr>
<tr>
<td>1699</td>
<td>1573</td>
<td>1548</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of M or P marginal mean: 50.1 lb./ac.
S.E. of S marginal mean: 61.3 lb./ac.
S.E. of body of M×S or P×S table or control: 86.7 lb./ac.
S.E. of body of M×P table: 70.8 lb./ac.

Crop: Wheat (Rabi).  
Ref: I.A.R.I. 53(10).  
Type: 'M'.

Object: To find out the amount of F.Y.M. which is equivalent to the corresponding amount of A/S.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 13.11.1953. (iv) (a) Two ploughings with desi plough, single discsing with tractor, double ploughing and planking. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding twice. (ix) N.A. (x) 11.4.1954.

2. TREATMENTS:
   1. No manure.
   2. 40 lb./ac. of N as F.Y.M.
   3. 60 lb./ac. of N as F.Y.M.
   4. 80 lb./ac. of N as F.Y.M.
   5. 100 lb./ac. of N as F.Y.M.
   6. 120 lb./ac. of N as F.Y.M.
   7. 20 lb./ac. of N as G.N.C.
   8. 40 lb./ac. of N as G.N.C.
   9. 60 lb./ac. of N as G.N.C.
   10. 80 lb./ac. of N as G.N.C.
   11. 20 lb./ac. of N as A/S.
   12. 40 lb./ac. of N as A/S.
3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 7. (iv) (a) 33’×22’. (b) 31’×20’. (v) 1’ alround. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—N.A. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS:
(i) 1617 lb./ac.
(ii) 808.9 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>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1341</td>
<td>7.</td>
<td>1721</td>
</tr>
<tr>
<td>2.</td>
<td>1401</td>
<td>8.</td>
<td>1578</td>
</tr>
<tr>
<td>3.</td>
<td>1502</td>
<td>9.</td>
<td>1726</td>
</tr>
<tr>
<td>4.</td>
<td>1607</td>
<td>10.</td>
<td>1726</td>
</tr>
<tr>
<td>5.</td>
<td>1773</td>
<td>11.</td>
<td>1721</td>
</tr>
<tr>
<td>6.</td>
<td>1705</td>
<td>12.</td>
<td>1799</td>
</tr>
</tbody>
</table>

S.E./mean = 311.0 lb./ac.

Crop :- Wheat (Rahi).
Ref :- I.A.R.I. 51(14). Type :- ‘M’.

Object :- To find the fertility building value of Guar along with P2O5 and micro-nutrients on Wheat.

1. BASAL CONDITIONS:
(i) (a) Guar-Wheat-Guar. (b) Guar. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3.12.1951. (iv) (a) 4 ploughings. (b) to (e) N.A. (vi) and (b) N.P. 700. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 17, 18..14952.

2. TREATMENTS:
1. Guar harvested for tops.
2. Guar buried as G.M.
3. Guar grown with 60 lb./ac. of P2O5 at sowing, harvested for tops.
4. Guar grown with 60 lb./ac. of P2O5 at sowing, buried as G.M.
5. Guar grown with 60 lb./ac. of P2O5+borax 5 lb./ac.+molybdenum 1 lb./ac. at sowing, harvested for tops.
6. Guar grown with 60 lb./ac. of P2O5+borax 5 lb./ac.+molybdenum 1 lb./ac. at sowing, buried as G.M.
7. Guar tops buried as obtained from treatment 1.
8. Guar tops buried as obtained from treatment 3.
9. Guar tops buried as obtained from treatment 5.
10. Control (fallow in kharif).

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 45’×15’. (b) 41’×11’. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Severe lodging in February. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Damage due to hail storm and squalls was about 70 to 80%. (vii) Nil.

5. RESULTS:
(i) 415.8 lb./ac.
(ii) 115.2 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>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>325.0</td>
<td>6.</td>
<td>464.1</td>
</tr>
<tr>
<td>2.</td>
<td>594.9</td>
<td>7.</td>
<td>397.4</td>
</tr>
<tr>
<td>3.</td>
<td>377.7</td>
<td>8.</td>
<td>412.2</td>
</tr>
<tr>
<td>4.</td>
<td>454.2</td>
<td>9.</td>
<td>462.4</td>
</tr>
<tr>
<td>5.</td>
<td>581.8</td>
<td>10.</td>
<td>288.8</td>
</tr>
</tbody>
</table>

S.E./mean = 47.04 lb./ac.
Crop :- Wheat (Rabi).  
Ref :- I.A.R.I. 52(21).  Type :- 'M'.

Object :- To find the fertility building value of Guar along with P<sub>2</sub>O<sub>5</sub> and micro-nutrients on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Guar-Wheat-Guar.  (b) Guar.  (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 24.11.1953.  (iv) 2 ploughings.  (b) to (e) N.A.  (v) N.A.  (vi) N.A.  (vii) Irrigated.  (viii) Nil.  (ix) N.A.  (x) 16.4.1954.

2. TREATMENTS:
   1. Guar harvested for tops.
   2. Guar buried as G.M.
   3. Guar grown with 60 lb./ac. of P<sub>2</sub>O<sub>5</sub> at sowing, harvested for tops.
   4. Guar grown with 60 lb./ac. of P<sub>2</sub>O<sub>5</sub> at sowing, buried as G.M.
   5. Guar grown with 60 lb./ac. of P<sub>2</sub>O<sub>5</sub>+Borax 5 lb./ac.+molybdenum 1 lb./ac. at sowing, harvested for tops.
   6. Guar grown with 60 lb./ac. of P<sub>2</sub>O<sub>5</sub>+Borax 5 lb./ac.+molybdenum 1 lb./ac. at sowing, buried as G.M.
   7. Guar tops buried as obtained from treatment 1.
   8. Guar tops buried as obtained from treatment 3.
   9. Guar tops buried as obtained from treatment 5.
   10. Control (fallow in kharif).

3. DESIGN:
   (i) R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 6.  (iv) (a) 45'x15'.  (b) N.A.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Normal.  (ii) Attack by white ants.  (iii) Grain yield.  (iv) (a) 1951—1954.  (b) Yes.  (c) N.A.  (v) (a) and (b) No.  (vi) Hot winds at the end of January hastened the maturity of the crop, resulting in low yield.  (vii) Nil.

5. RESULTS:
   (i) 1858 lb./ac.
   (ii) 255.9 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1487</td>
<td>6.</td>
<td>2008</td>
</tr>
<tr>
<td>2.</td>
<td>1877</td>
<td>7.</td>
<td>1683</td>
</tr>
<tr>
<td>3.</td>
<td>1795</td>
<td>8.</td>
<td>1875</td>
</tr>
<tr>
<td>4.</td>
<td>2396</td>
<td>9.</td>
<td>1896</td>
</tr>
<tr>
<td>5.</td>
<td>1745</td>
<td>10.</td>
<td>1422</td>
</tr>
</tbody>
</table>

S.E./meann=104.5 lb./ac.

Crop :- Wheat (Rabi).  
Ref :- I.A.R.I. 53(21).  Type :- 'M'.

Object :- To find the fertility building value of Guar along with P<sub>2</sub>O<sub>5</sub> and micro-nutrients on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Guar-Wheat-Guar.  (b) Soyabean (fodder).  (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 24.11.1953.  (iv) (a) Ploughing with victory plough and 6 ploughings with desi plough.  (b) to (e) N.A.  (v) and (vi) N.A.  (vii) Irrigated.  (viii) Weeding and bakharing.  (ix) N.A.  (x) 16.4.1954.
7. Guar tops buried as obtained from treatment 4.
8. Guar tops as obtained from treatment 3.
9. Guar tops buried as obtained from treatment 5.
10. Control (fallow in kharif).

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

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1168 lb./ac.
(ii) 229.6 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1000</td>
<td>6.</td>
<td>1221</td>
</tr>
<tr>
<td>2.</td>
<td>1195</td>
<td>7.</td>
<td>1260</td>
</tr>
<tr>
<td>3.</td>
<td>1039</td>
<td>8.</td>
<td>1273</td>
</tr>
<tr>
<td>4.</td>
<td>1403</td>
<td>9.</td>
<td>1233</td>
</tr>
<tr>
<td>5.</td>
<td>1130</td>
<td>10.</td>
<td>922</td>
</tr>
</tbody>
</table>
S.E./mean = 93.75 lb./ac.

Object: To study the effect of organic and inorganic manuring on the yield of crops in rotations.

1. BASAL CONDITIONS to 4. GENERAL.
Please refer to No. 52(54) under BAJRA.

RESULTS:
(i) 1390 lb./ac.
(ii) (a) 336.0 lb./ac.
(b) 162.0 lb./ac.
(iii) Main effect of N alone is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$F_2$</th>
<th>$F_1$</th>
<th>$F_3$</th>
<th>$F_4$</th>
<th>$F_5$</th>
<th>$F_6$</th>
<th>$F_7$</th>
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<tbody>
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<td>$N_1$</td>
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<td>1254</td>
<td>1344</td>
<td>1259</td>
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<td>1435</td>
</tr>
<tr>
<td>$N_3$</td>
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<td>1368</td>
<td>1572</td>
<td>1452</td>
<td>1443</td>
<td>1443</td>
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</tr>
<tr>
<td>Mean</td>
<td>1312</td>
<td>1324</td>
<td>1480</td>
<td>1380</td>
<td>1452</td>
<td>1390</td>
<td>1390</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. F marginal means = 122.6 lb./ac.
2. N marginal means = 45.8 lb./ac.
3. N means at a level of F = 102.6 lb./ac.
4. F means at a level of N = 136.2 lb./ac.
Crop: Wheat.  
Ref: I.A.R.I. 52(27).  
Type: 'C'.

Object: — To study the effect of sowing premature and mature seed of kharif crops on the yield.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 4, 5-11-1952.  (iv) (a) 1 pedana, 2 tractor discings, 2 soughs and tractor grubbing.  (b) to (e) N.A.  (v) Nil.  (vi) Wheat NP-760 and C-581, barley NP-13, gram NP-58 and peas NP-29.  (vii) Unirrigated.  (viii) Weeding. (ix) N.A.  (x) May, 1952.

2. TREATMENTS:
   1. Sowing fully mature seed.
   2. Sowing one week premature seed.
   3. Sowing 2 weeks premature seed.

3. DESIGN:
   (i) R.B.D.  (ii) 3 for each of wheat NP-760 and C-518, barley, gram and pea crop.  (b) N.A.  (iii) 8.  (iv) (a) N.A.  (b) 1/80 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Above normal.  Lodging in NP-760 wheat.  (ii) Smut in C-518 wheat.  (iii) Yield of grain (iv) (a) 1952 — N.A.  (b) Yes.  (c) N.A.  (v) (a) and (b) No.  (vi) Nil.  (vii) Raw data is N.A. Results of other crops may be seen under relevant crops.

5. RESULTS:

<table>
<thead>
<tr>
<th>Crop: Wheat NP-760</th>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>3455</td>
<td>66.64 lb/ac.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3255</td>
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</tr>
<tr>
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<td>3</td>
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</table>

<table>
<thead>
<tr>
<th>Crop: Wheat C-518</th>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>3817</td>
<td>66.18 lb/ac.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3490</td>
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</tr>
<tr>
<td></td>
<td>3</td>
<td>2927</td>
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</table>

Crop: Wheat (Rabi).

Type: 'C'.

Object: — To study the growth and development of premature seed of Wheat, Barley, Gram and Peas.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 4, 5-11-1953.  (iv) (a) 4 dest. ploughings.  (b) to (e) N.A.  (v) Nil.  (vi) Wheat NP-760, Wheat C-516, Barley N.P. 13, Gram N.P. 58 and Pea N.P. 29.  (vii) N.A.  (viii) Bokharing in wheat. (ix) N.A.  (x) May 1954.

2. TREATMENTS:
   1. Sowing fully matured seed.
   2. Sowing one week premature seed.
   3. Sowing two weeks premature seed.

3. DESIGN:
   (i) R.B.D.  (ii) 3 for each crop.  (b) N.A.  (iii) 8.  (iv) (a) N.A.  (b) 1/80 acre.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Peas and gram crop remained very poor.  (ii) N.A.  (iii) Grain yield (Wheat, Barley, Gram, Peas) (iv) (a) 1952 to 1954.  (b) Yes.  (c) N.A.  (v) (a), (b) No.  (vi) Nil.  (vii) Experiment conducted on 5 crops as given under item (vi) in Basal conditions. Results of the other crops are given under relevant crops.

5. RESULTS:

<table>
<thead>
<tr>
<th>Crop: Wheat NP-760</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2274 lb/ac.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>118.5 lb/ac.</td>
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<table>
<thead>
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<th>Crop: Wheat C-516</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>1</td>
<td>2305 lb/ac.</td>
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<tr>
<td></td>
<td>2</td>
<td>128.4 lb/ac.</td>
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</tbody>
</table>
Object: To study the effect of frequency of cultivation with and without weeding and nitrogenous fertilizers on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) N.A. (d) (a) and (b) Refer item 11 on page 143. (iii) 12.11.1951. (iv) (a) As per treatments. (b) Sown by monarch drill. (c) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding twice. (ix) N.A. (x) 2 to 6.4.1952.

2. TREATMENTS:
   Main-plot treatments:
   4 levels of ploughings: C1=3 ploughings, C2=6 ploughings, C3=9 ploughings and C4=12 ploughings.
   Sub-plot treatments:
   2 levels of N as A/S: N0=no manure and N1=40 lb./ac. of N.
   Sub-sub-plot treatments:
   3 levels of weedings: W0=no weeding, W1=one weeding, and W2=two weedings
   A/S applied on 11.11.1951.

3. DESIGN:
   (i) Split-plot (main-plots in L. sq.). (ii) (a) 4 main-plots/block, 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 63×20’. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. Crop badly damaged and completely lodged due to hail-storm on 1.5.1952. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) Yes. (c) N.A. (v) (a) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 593 lb./ac.
   (ii) (a) 182.7 lb./ac.
   (b) 156.3 lb./ac.
   (c) 59.2 lb./ac.
   (iii) C, N and M effects are all highly significant. All two factor interactions are significant while three factor interaction is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N0</th>
<th>N1</th>
<th>Mean</th>
<th>W0</th>
<th>W1</th>
<th>W2</th>
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<td>565</td>
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<td>722</td>
<td>615</td>
<td>800</td>
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<td>C4</td>
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<td>808</td>
<td>693</td>
<td>534</td>
<td>820</td>
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<tr>
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<td>486</td>
<td>701</td>
<td>593</td>
<td>494</td>
<td>679</td>
</tr>
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<td>W2</td>
<td>498</td>
<td>716</td>
<td>607</td>
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</table>
S.E. of difference of two
1. C marginal means = 52.73 lb./ac.
2. N marginal means = 36.84 lb./ac.
3. W marginal means = 17.09 lb./ac.
4. N means at the same level of C = 63.81 lb./ac.
5. C means at the same level of N = 69.43 lb./ac.
6. W means at the same level of C = 58.01 lb./ac.
7. C means at the same level of W = 24.17 lb./ac.
8. W means at the same level of N = 29.60 lb./ac.
9. N means at the same level of W = 41.79 lb./ac.

Crop : Wheat (Rabi).
Ref : I.A.R.I. 52(24). Type : 'CM'.

Object: To study the effect of frequency of cultivation with and without weeding and nitrogenous fertilizers on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 8.11.1952. (iv) (a) As per treatments. (b) Simplex seed drill. (c) 1 md/ac. of seed. (d) and (e) N.A. (v) N.A. (vi) N.P. 775. (vii) Irrigated. (viii) Weeding twice. (a) N.A. (x) 30.3.1953; 1.4.1953.

2. TREATMENTS:
   Main-plot treatments:
   4 levels of ploughing: C1 = 3 ploughings, C2 = 6 ploughings, C3 = 9 ploughings and C4 = 12 ploughings.

   Sub-plot treatments:
   2 levels of N as A/S: N0 = 0 lb./ac. of N.

   Sub-sub-plot treatments:
   3 levels of weeding: W0 = No weeding, W1 = One weeding and W2 = 2 weedings.

   A/S applied on 6, 7.11.1951.

3. DESIGN:
   (i) Split-plot. (main-plot in L. Sq.). (ii) (a) 4 main-plots/block 2 sub-plots/main-plot and 3 sub-sub plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 53.5' X 20' (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   Germination was visible on 4th to 7th day. The early stand of crop was quite good. The manured and more cultivated plots showed in general better growth. It was differently invisible between manured and unmanured plots. No lodging. (ii) Attack of loose smut on wheat roughing was done to check the attack. (iii) Grain yield. (iv) (a) 1951—1953, (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1758 lb./ac.
   (ii) (a) 176.07 lb./ac.
   (b) 50.19 lb./ac.
   (c) 181.03 lb./ac.
   (iii) Effects of C and N are highly significant interaction C x N is significant while others are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N0</th>
<th>N1</th>
<th>Mean</th>
<th>W0</th>
<th>W1</th>
<th>W2</th>
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<td>1477</td>
<td>1446</td>
<td>1461</td>
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<td>C2</td>
<td>1558</td>
<td>1770</td>
<td>1664</td>
<td>1526</td>
<td>1691</td>
</tr>
<tr>
<td>C3</td>
<td>1814</td>
<td>2007</td>
<td>1950</td>
<td>1857</td>
<td>1957</td>
</tr>
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<td>Mean</td>
<td>1651</td>
<td>1865</td>
<td>1758</td>
<td>1725</td>
<td>1774</td>
</tr>
</tbody>
</table>

| W0 | 1647 | 1803 | 1725 |
| W1 | 1650 | 1888 | 1774 |
| W2 | 1646 | 1904 | 1775 |
S.E. of difference of two
1. C marginal means  = 50.83 lb./ac.
2. N marginal means  = 11.83 lb./ac.
3. W marginal means  = 52.26 lb./ac.
4. N means at the same level of C = 20.49 lb./ac.
5. C means at the same level of N = 52.86 lb./ac.
6. W means at the same level of C = 56.77 lb./ac.
7. C means at the same level of W = 62.25 lb./ac.
8. W means at the same level of N = 72.35 lb./ac.
9. N means at the same level of W = 73.91 lb./ac.

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Crop: Wheat (Rabi).
Ref: I.A.R.I. 53(24). Type: 'CM'.

Object: To study the effect of frequency of cultivation with and without weeding and nitrogenous fertilizers on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 7.11.1953. (iv) (a) As per treatments. (b) Sowed down with monoblock drill. (c) 1 md/ac. (d) Rows 9' apart. (e) N.A. (v) N.A. (vi) N.P.775. (vii) Irrigated. (viii) Weeding was done with khurpi. (ix) N.A. (x) 16.4.1954.

2. TREATMENTS:
   Main-plot treatments:
   - 4 levels of ploughings: C1 = 3 ploughings, C2 = 6 ploughings, C3 = 9 ploughings and C4 = 12 ploughings.
   Sub-plot treatments:
   - 2 levels of N as A/S: N0 = 0 and N1 = 40 lb./ac. of N.
   Sub-sub-plot treatments:
   - 3 levels of weeding: W0 = No weeding, W1 = One weeding and W2 = 2 weedications.
   A/S applied on 2.11.1953.

3. DESIGN:
   (i) Split-plot (main-plots in L. Sq.). (ii) (a) 4 main-plots/block, 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 53.3' x 20'. (b) N.A. (v) N.A. (vi) N.A.

4. GENERAL:
   (i) Poor stand. (ii) Nearly 30 to 35% infection of smut. (iii) Grain yield. (iv) (a) 1951—1953. (b) Yes (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 993 lb./ac.
   (ii) 196.65 lb./ac.
   (b) 222.16 lb./ac.
   (c) 62.53 lb./ac.
   (iii) Effect of C and W are highly significant. Interaction N X W is significant. Others are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>Mean</th>
<th>W0</th>
<th>W1</th>
<th>W2</th>
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<tr>
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<tr>
<td>1185</td>
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<td></td>
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</tbody>
</table>

S.E. of difference of two
1. C marginal means  = 56.77 lb./ac.
2. N marginal means  = 45.35 lb./ac.
3. W marginal means  = 15.65 lb./ac.
4. N means at the same level of C = 90.70 lb./ac.
5. C means at the same level of N = 85.65 lb./ac.
6. W means at the same level of C = 31.26 lb./ac.
7. C means at the same level of W = 62.25 lb./ac.
8. W means at the same level of N = 22.11 lb./ac.
9. N means at the same level of W = 48.81 lb./ac.
Crop: Wheat (Rabi).  Ref: I.A.R.I. 49(2).  Type: 'CM'.

Object: To study the effect of different spacings, fertilizers, methods of placement, and different levels of N and P with and without basal dressing on maize crop and residual effect on Rabi Wheat.

1. BASAL CONDITIONS:
(i) (a) Wheat-Maize-Oats (b) and (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 3.12.1949.  (iv) (a) Discing twice beamng after tractor discing.  (b) to (e) N.A.  (vi) N.A.  (vii) Irrigated.  (viii) and (ix) N.A.  (x) 29.4.1950 to 1.5.1950.

2. TREATMENTS:
Main-plot treatments:
2 levels of basal dressing: B0=0 and B1=20 lb/ac. of N as F.Y.M.
Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 methods of placement: M1=Broadcast and M2=Placement at a certain depth.
(2) 3 spacings: S1=2', S2=24' and S3=3' between rows.
Sub-sub-plot 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) 2 levels of P2O5 and K2O as Super and Pot. Sul.: P1=40 lb/ac. of P2O5+20 lb/ac. of K2O and P2=80 lb/ac. of P2O5+20 lb/ac. of K2O.

3. DESIGN:
(i) Split-plot.  (ii) (a) 2 main-plots/replication, 6 sub-plots/main-plot and 6 sub-sub-plots/sub-plot.
(b) N.A.  (iii) 2.  (iv) (a) 36’x33’.  (b) 34’x30’.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Fair.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1949—N.A.  (b) and (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1136 lb/ac.
(ii) (a) 1876 lb/ac.
(b) 467 lb/ac.
(c) 170 lb/ac.
(iii) N.A.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
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</tbody>
</table>
S.E. of difference of two

1. B marginal means = 312.7 lb./ac. 13. M means at the same level of N = 87.55 lb./ac.
2. M marginal means = 79.89 lb./ac. 14. N means at the same level of S = 60.10 lb./ac.
3. S marginal means = 90.33 lb./ac. 15. S means at the same level of N = 107.22 lb./ac.
4. N marginal means = 34.70 lb./ac. 16. P means at the same level of B = 40.07 lb./ac.
5. P marginal means = 28.33 lb./ac. 17. B means at the same level of P = 315.95 lb./ac.

6. M means at the same level of B = 31.78 lb./ac. 18. M means at the same level of N = 40.07 lb./ac.
7. B means at the same level of M = 322.55 lb./ac. 19. B means at the same level of P = 49.07 lb./ac.
8. S means at the same level of B = 38.92 lb./ac. 20. P means at the same level of S = 60.10 lb./ac.
9. B mean at the same level of S = 331.50 lb./ac. 21. P means at the same level of B = 331.25 lb./ac.
10. N means at the same level of B = 49.07 lb./ac. 22. N means at the same level of B = 315.20 lb./ac.
11. B means at the same level of S = 38.92 lb./ac. 23. P means at the same level of B = 49.07 lb./ac.
12. N means at the same level of M = 49.07 lb./ac.

Crop :- Wheat (Rabi).


1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1.11.1953. (iv) (a) Ploughing with victory plough, ploughing three with desi plough and beaming twice. (b) to (e) N.A. (v) N.A. (vi) N.P.T.I5. (vii) Irrigated. (viii) Baklraring and weeding. (ix) 5.30'. (x) 18.4.1954.

2. TREATMENTS:
   Main-plot treatments:
   2 rotations : R1 = Bajra - Wheat and R2 = Fallow-Wheat.
   Sub-plot treatments:
   5 levels of F.Y.M. : F0 = 0, F1 = 21, F2 = 5, F3 = 10 and F4 = 20 ton/acre of F.Y.M.
   Sub-sub-plot treatments:
   3 levels of N : N0 = 0, N1 = 20 and N2 = 40 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication, 5 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 58' x 124'. (b) 55' x 94'. (c) N.A. (vi) Yes.

4. GENERAL:
   (i) Good in R2 and poor in R1. Considerable lodging all over in R2 due to heavy growth and rain and strong wind in III week of February, 1954. No lodging in R1. (ii) Mild attack of rust (yellow and black, comparatively more rust in R2 due to lodging, smut attack about 4% of the plants affected. (iii) Grain yield. (iv) (a) 1952 - N.A., (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1345 lb./ac.
   (ii) (a) 198.5 lb./ac.
   (b) 174.9 lb./ac.
   (c) 118.7 lb./ac.
   (iii) Effect of R is highly significant, effects of N and interaction R x N are significant, while all others are not significant.

   (iv) Av. yield of grain in lb./ac.

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Crop :- Wheat (Rabi).

Ref :- I.A.R.I. 53(48). Type :- 'CM',

Type :- 'CM',

Object :- To study the effect of organic and inorganic manuring on the yield of crops in 3 rotations:

2. Fallow-Wheat.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1.11.1953. (iv) (a) Ploughing with victory plough, ploughing three with desi plough and beaming twice. (b) to (e) N.A. (v) N.A. (vi) N.P.T.I5. (vii) Irrigated. (viii) Baklraring and weeding. (ix) 5.30'. (x) 18.4.1954.

2. TREATMENTS:
   Main-plot treatments:
   2 rotations : R1 = Bajra - Wheat and R2 = Fallow-Wheat.
   Sub-plot treatments:
   5 levels of F.Y.M. : F0 = 0, F1 = 21, F2 = 5, F3 = 10 and F4 = 20 ton/acre of F.Y.M.
   Sub-sub-plot treatments:
   3 levels of N : N0 = 0, N1 = 20 and N2 = 40 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication, 5 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 58' x 124'. (b) 55' x 94'. (c) N.A. (vi) Yes.

4. GENERAL:
   (i) Good in R2 and poor in R1. Considerable lodging all over in R2 due to heavy growth and rain and strong wind in III week of February, 1954. No lodging in R1. (ii) Mild attack of rust (yellow and black, comparatively more rust in R2 due to lodging, smut attack about 4% of the plants affected. (iii) Grain yield. (iv) (a) 1952 - N.A., (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1345 lb./ac.
   (ii) (a) 198.5 lb./ac.
   (b) 174.9 lb./ac.
   (c) 118.7 lb./ac.
   (iii) Effect of R is highly significant, effects of N and interaction R x N are significant, while all others are not significant.

   (iv) Av. yield of grain in lb./ac.
Crop: Wheat (Rabi).
Ref: I.A.R.I. 50(61).
Type: ‘M’.

Object: To study the depth of cultivation with and without inversion of soil on the yield of fallow Wheat.

1. BASAL CONDITIONS:
   (i) (a) Maize—wheat. (b) Maize. (c) N.A. (ii) (a) Light soil. (b) Refer item II on page 143. (iii) 5.11.1950. (iv) (a) As per treatments. (b) Sown behind de si plough by ‘Pona’. (c) to (e) N.A. (v) N.A. (vi) C-518. (vii) Irrigated. (viii) Hoeing with Bakhar. (ix) N.A. (x) 22, 24.4.1951.

2. TREATMENTS:
   Main-plot treatments:
   4 cultural treatments: $C_1$—Ploughing $9''-10''$ depth with tractor plough in the first instance followed by normal cultivation with tractor implement (7 times). $C_2$—Ploughing $3''$ depth with soil inverting (Dac) plough by bullocks in the first instance followed by normal cultivation with country plough (8 times). $C_3$—Country plough (8 times). $C_4$—Tractor discing (7 times).

   Sub-plot treatments:
   4 levels of N as F.Y.M.: $N_0=0$, $N_1=40$, $N_2=80$ and $N_3=120$ lb./ac. F.Y.M. spread on 19, 20, 27 and 28.10.1950.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) $1/40$ acre. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) The seeds germinated after 6 days of sowing, i.e. on 11.11.1952. Growth very good. No difference in the growth of various cultural treatments. Crop lodged. (ii) Slight smut infection. Smut earheads were roughed. (iii) Grain yield. (iv) (a) Yes; 1950—1954. (b) Yes. (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2780 lb./ac.
   (ii) $447.7$ lb./ac.
   (b) 249.3 lb./ac.
   (iii) Only $C$ effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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Crop : Wheat (Rabi).  
Ref: I.A.R.I. 50(11).  
Type : 'M'.

Object :—To study the effect of depth of cultivation with and without inversion on the yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) (a) Heavy soil. (b) Refer item 11 on page 143. (iii) 5.11.1950.  (iv) (a) As per treatments. (b) Sown with drill plough. (c) to (e) N.A.  (v) N.A.  C-518.  (vi) Irrigated.  (vii) Hoeing with Oudh plough.  (ix) N.A.  (x) 19.4.1951.

2. TREATMENTS :
   Main-plot treatments : 
   4 cultural treatments : 
   C_1 : Tractor ploughing 9'-10' depth with soil inverting followed by normal cultivation with tractor implement (Discing). 
   C_2 : 5' depth, bullock soil inverting plough followed by normal cultivation with country plough. 

   Sub-plot treatments : 
   4 levels of N as F.Y.M. : N_0 = 0, N_1 = 40, N_2 = 80 and N_3 = 120 lb./ac. of N.
   F.Y.M. applied on 19, 20, 27 to 29.10.1953.

3. DESIGN :
   (i) Split-plot.  (ii) (a) 4 main plots/block and 4 sub-plots/main-plot.  (b) N.A.  (iii) 3. (a) 1/40 acre.  (b) 1/52 acre  (v) N.A.  (vi) Yes.

4. GENERAL : 
   (i) Normal.  (ii) Loose smut. Mild attack of aphids.  (iii) Grain yield.  (iv) (a) Yes; 1950 to 1954.  (b) Yes.  (c) N.A.  (v) (a), (b) No.  (vi) Some area towards north was water-logged.  (vii) Nil.

5. RESULTS :
   (i) 1967 lb./ac.
   (ii) (a) 370.3 lb./ac.
   (b) 444.3 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

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<thead>
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   Mean 2007 2070 1979 1812 1967

S.E. of difference of two
   1. C marginal means = 151.2 lb./ac.
   2. N marginal means = 181.4 lb./ac.
   3. N means at the same level of C = 362.8 lb./ac.
   4. C means at the same level of N = 348.7 lb./ac.
Crop: Wheat (Rabi).  
Ref: I.A.R.I. 51(18).  
Type: 'CM'.

Object: To study the effect of depth of cultivation with and without inversion on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) N.A. (ii) (a) Heavy soil. (b) Refer item 11 on page 143. (iii) 5.11.1951. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 9.4.1952.

2. TREATMENTS:
   Main-plot treatments: 
   4 cultural treatments: C₁=Tractor ploughing 9°-10° followed by normal cultivation with tractor disc, C₂=5° bullock soil inverting victory plough followed by normal cultivation with desi plough, C₃=Country plough and C₄=Tractor discing.

Sub-plot treatments: 
4 levels of N as F.Y.M.: N₀=0, N₁=40, N₂=80 and N₃=120 lb./ac. of N.

3. DESIGN: 
(i) Split-plot. (ii) (a) 4 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4, (iv) (a) 40'×26.5', (b) 50'×23'. (v) N.A. (vi) Yes.

4. GENERAL: 
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS: 
   (i) 2103 lb./ac.
   (ii) (a) 274.8 lb./ac.
   (b) 346.4 lb./ac.
   (iii) Main effect of C is highly significant and effect of N is significant while interaction is not significant.
   (iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. C marginal mean = 97.1 lb./ac.
2. N marginal mean = 122.4 lb./ac.
3. N mean at the same level of G = 244.8 lb./ac.
4. C mean at the same level of N = 233.3 lb./ac.

Crop: Wheat (Rabi).  
Ref: I.A.R.I. 52(18).  
Type: 'CM'.

Object: To study the depth of cultivation with and without inversion on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) to (c) N.A. (ii) (a) Heavy soil. (b) Refer item 11 on page 143. (iii) 14, 15.11.1952. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Bakhorlay; hoeing with oudh plough. (ix) N.A. (x) 12, 15.7.1953.
2. TREATMENTS:

Main-plot treatments:
4 cultural treatments: C₁=Tractor ploughing 9"-10" deep followed by tractor grubber and disc, C₂=Bullock driven victory plough 6" (inversion)+country plough, C₃=Country plough alone and C₄=Tractor discing alone.

Sub-plot treatments:
4 levels of N as F.Y.M.: N₀=0, N₁=40, N₂=80 and N₃=120 lb/ac. of N.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950-1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A.

5. RESULTS:

(i) 2247 lb/ac.
(ii) (a) 493.8 lb/ac.
(b) 332.4 lb/ac.
(iii) Av. yield of grain in lb/ac.

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<td>S.E./mean</td>
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Object: To study the depth of cultivation with and without inversion on the yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) No. (b) and (c) N.A. (ii) (a) Heavy soil. (b) Refer item 11 on page 143. (iii) 16.11.1953. (iv) (a) As per treatments. (b) Sown with drill. (c) N.A. (d) 9" between rows. (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) bachelor. (ix) N.A. (x) 21, 22.4.1954.

2. TREATMENTS:

Main-plot treatments
4 cultural treatments: C₁=Tractor ploughing 9"-10" deep followed by tractor grubber, C₂=Bullock victory plough 5" to 6" deep followed by country plough, C₃=Country plough 4"-5" and C₄=Tractor disc 3"-4".

Sub-plot treatments:
4 levels of N as F.Y.M.: N₀=0, N₁=40, N₂=80 and N₃=120 lb/ac of N.
F.Y.M. applied on 12, 15.9.1953.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1273 lb/ac.
(ii) (a) 165.4 lb/ac.
(b) 162.9 lb/ac.
(iii) Effects of C and N are significant. Interaction is not significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. C marginal means = 58.48 lb./ac.
2. N marginal means = 57.60 lb./ac.
3. N means at the same level of C = 115.20 lb./ac.
4. C means at the same level of N = 115.83 lb./ac.

Crop: Wheat (Rabi).

Object: To study the effect of Napier grass on the soil fertility and yield of subsequent cereal crops under manured and unmanured conditions.

1. BASAL CONDITIONS:
(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Wheat on 11.12.1950 and 31.11.1950. (iv) (a) Ploughing with desi plough (wheat plots), 10.11.1950. (b) N.A. (c) 30 lb./ac. (d) and (e) N.A. (v) 40 lb./ac. of N as A/S on 22.2.1951 to Napier plots. (vi) N.A. (vii) Irrigated. (viii) Wheat bokharing on 30.12.1950 and hoeing grass plots with horse hoe on 31.12.1950. (ix) N.A. (x) Napier on 22.4.1951 and wheat on 30.4.1951.

2. TREATMENTS:
Main-plot treatments:
4 rotational treatments: R₁=Control, (maize-wheat rotation), R₂=Napier (2 years)— maize-wheat, R₃=Napier (3 years)— Maize-wheat and R₄=Napier (4 years)— maize-wheat.

Sub-plot treatments:
2 levels of manure: M₀=No manure and M₁=Manure at 40 lb./ac. of N as F.Y.M.+A/S.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 37°×29.5°. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) Yes. (c) N.A. (v) (a) and (b) Nil. (vi) Nil. (vii) Only wheat yield was taken into consideration.

5. RESULTS:
(i) 1954 lb./ac.
(ii) 2160 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of wheat grain in lb./ac.

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</tr>
</thead>
<tbody>
<tr>
<td>M₀</td>
<td>954</td>
</tr>
<tr>
<td>M₁</td>
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</table>

S.E./mean = 88.2 lb./ac.
Crop: Wheat (Rabi)  
Ref.: I.A.R.I. 31(4)  
Type: 'CM'

Object: To study the effect of Napier grass on the soil fertility and yield of subsequent cereal crops under manured and unmanured conditions.

1. BASAL CONDITIONS:
   (i) (a), (b) As per treatments. (c) N.A.  

2. TREATMENTS:
   Main-plot treatments:
   4 crop rotations: \( R_1 = \text{Control: Maize and Wheat}, \ R_2 = \text{Napier (2 years)-Maize and Wheat}, \ R_3 = \text{Napier (3 years)-Maize and Wheat} \) and \( R_4 = \text{Napier (4 years)-Maize and Wheat} \).

Sub-plot treatments:
2 manures: \( M_0 = 0 \) and \( M_1 = 40 \text{ lb./ac. of N as A/S} \).

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 (Kharif) to 1953. (b) Yes. (c) N.A. (v) (a), (b) Nil. (vi) Yes. (vii) The analysis was done only for wheat crop.

5. RESULTS:
   (i) 470.2 lb./ac.  
   (ii) 120.0 lb./ac.  
   (iii) Treatments do not differ significantly.  
   (iv) Av. yield of grain in lb./ac.

<table>
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<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tbody>
<tr>
<td>( M_0 )</td>
<td>396.9</td>
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<tr>
<td>( M_1 )</td>
<td>543.6</td>
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</table>

S.E./mean = 48.9 lb./ac.

Crop: Wheat (Rabi)  
Ref.: I.A.R.I. 32(4)  
Type: 'CM'

Object: To study the effect of Napier grass on the soil fertility and yield of subsequent cereal crops under manured and unmanured conditions.

1. BASAL CONDITIONS:
   (i) (a), (b) As per treatments. (c) N.A.  
   (ii) (a) and (b) Refer item 11 on page 143. (iii) Wheat on 30, 31.10.1952, Napier 16, 17.11.1952. (iv) (a) Ploughing with victory plough once and twice with desi plough. (b) to (e) N.A. (v) Nil. (vi) Wheat C-518. (vii) Irrigated. (viii) N.A. (ix) N.A. (a) Napier on 13.5.1953 and Wheat on 5.9.1953.

2. TREATMENTS:
   Main-plot treatments:
   4 crop rotations: \( R_1 = \text{Control: Maize and Wheat}, \ R_2 = \text{Napier (2 years)-Maize and Wheat}, \ R_3 = \text{Napier (3 years)-Maize and Wheat} \) and \( R_4 = \text{Napier (4 years)-Maize and Wheat} \).

Sub-plot treatments:
2 manures: \( M_0 = 0 \) and \( M_1 = 40 \text{ lb./ac. of N as A/S} \).

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.
5. RESULTS:
(i) 446.6 lb./ac.
(ii) (a) 67.2 lb./ac.  
(b) 29.6 lb./ac.  
(iii) None of the effects is significant.  
(iv) Av. yield of grain in lb./ac.

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<tr>
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<td>423.3</td>
<td>470.0</td>
<td>446.6</td>
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S.E. of difference of two
1. R marginal means = 27.43 lb./ac.  
2. M marginal means = 12.08 lb/ac.  
3. M means at the same level of R = 17.10 lb./ac.  
4. R means at the same level of M = 29.98 lb./ac.

Crop: Wheat (Rabi).  
Type: ‘CM’.

Object: To study the effect of Napier grass on the soil fertility and yield of subsequent cereal crops under manured and unmanured conditions.

1. BASAL CONDITIONS:
(i) (a) and (b) As per treatments. (c) N.A.  
(ii) (a) and (b) Refer item 11 on page 143.  
(iii) 29.10.1953.  
(iv) (a) 1 ploughing with victory plough 7.9.1953.  
(v) Harrowing (spring harrow) 23.5.1953 and  
(vi) ploughing with deshi plough thrice. (b) N.A.  
(vii) 4.4.1954.  
(viii) Irrigated. (ix) Bakhrinig 12.11.1953. (x) N.A.  
(x) 4.4.1954.

2. TREATMENTS:
Main-plot treatments:
4 crop rotation: R1=Control: Maize and Wheat, R2=Napier (2 years)—Maize and Wheat, R3=Napier (3 years)—Maize and Wheat and R4=Napier (4 years)—Maize and Wheat.

Sub-plot treatments:
2 manures: M0=0 and M1=40 lb./ac. of N as A/S.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication, 2 sub-plots/main-plot. (b) N.A.  
(iii) 6. (iv) (a) N.A. (b) 1/40  
(v) ac. (vi) N.A. (vii) Yes.

4. GENERAL:
(i) Normal.  
(ii) N.A. (iii) Grain yield.  
(iv) (a) 1950—1953. (b) Yes.  
(v) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 818 lb./ac.  
(ii) (a) 192.0 lb./ac.  
(b) 84.0 lb./ac.  
(iii) R effect is significant, M effect is highly significant and interaction is not significant.  
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
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<td>940</td>
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</table>
Crop: Wheat (Rabi).  
Ref:- I.A.R.I. 50(40).  
Type: 'CMV'.

Object: To find out the optimum seed-rate of Wheat varieties under manured and unmanured conditions.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 13, 14, 11.1950.  (iv) (a) Ploughing with tractor and discing.  (b) N.A.  (c) As per treatments.  (d) N.A.  (e) N.A.  (f) As per treatments.  (vii) Irrigated.  (viii) N.A.  (ix) N.A.  (x) 17.4.1951 to 1.5.1951.

2. TREATMENTS:
   Main-plot treatments:
   5 seed rates: R₁=50, R₂=65, R₃=80, R₄=95 and R₅=110 lb./ac.
   Sub-plot treatments:
   2 varieties: V₁=N.P. 165 and V₂=C-518.
   Sub-sub-plot treatments:
   2 levels of N as A/5: N₀=0 and N₁=20 lb./ac. of N.

3. DESIGN:
   (i) Split-plot in L.Sq.  (ii) (a) 5 main-plots/block, 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot.  (b) N.A.  (iii) 5.  (iv) (a) N.A.  (b) 1/48.4 ac.  (v) N.A.  (vi) N.A.

4. GENERAL:
   (i) N.A.  (ii) Removal of plants attacked by smut on 3, 4.3.1951.  (iii) Grain yield.  (iv) (a) 1950–1953.  (b) No.  (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1774 lb./ac.  
   (ii) N.A.
   (iii) N effect is highly significant and interaction N×V is significant while all others are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
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<th>R₂</th>
<th>R₃</th>
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<th>R₅</th>
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<th>N₁</th>
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<td>1779</td>
<td>1641</td>
<td>1696</td>
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S.E's N.A.

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Crop: Wheat (Rabi).  
Ref:- I.A.R.I. 51(15).  
Type: 'CMV'.

Object: To find out the optimum seed-rate of Wheat varieties under manured and unmanured conditions.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 16, 17, 11.1951.  (iv) (a) Preparatory cultivation 2 victory ploughings, 1 dist ploughing discing and grubbing twice levelling and again ploughing with dist plough twice.  (b) N.A.  (c) As per treatments.  (d) Rows 9" apart.  (e) N.A.  (f) N.A.  (vi) As per treatments.  (vii) N.A.  (viii) No.  (ix) N.A.  (x) N.P. 165–10.4.1952; C-518–17.4.1952.
2. TREATMENTS:
Main-plot treatments:
5 seed rates: R_1=50, R_2=65, R_3=80, R_4=95 and R_5=110 lb./ac.
Sub-plot treatments:
2 varieties: V_1=N.P. 165 and V_2=C-518.
Sub-sub-plot treatments:
2 levels of N as A/S: N_0=0 and N_1=20 lb./ac. of N.

3. DESIGN:
(i) Split-plot in L. Sq. (ii) 5 main-plots/block, 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 58.5\times 11'. (v) N.A. (vi) N.A.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1952–1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1086 lb./ac.
(ii) (a) 291.2 lb./ac. (b) 336.8 lb./ac. (c) 408.4 lb./ac.
(iii) V effect is highly significant and interaction, N\times S, S\times V, V\times N are all significant while other effects are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R_1</th>
<th>R_2</th>
<th>R_3</th>
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<th>R_5</th>
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<th>N_1</th>
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<td>900</td>
<td>786</td>
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<td>1201</td>
<td>1181</td>
<td>1163</td>
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</table>

S.E. of difference of two
1. R marginal means = 92.06 lb./ac. 6. N means at the same level of R = 182.6 lb./ac.
2. V marginal means = 67.35 lb./ac. 7. R means at the same level of N = 158.6 lb./ac.
3. N marginal means = 81.68 lb./ac. 8. N means at the same level of V = 115.3 lb./ac.
4. V means at the same level of R = 150.60 lb./ac. 9. V means at the same level of N = 101.5 lb./ac.
5. R means at the same level of V = 167.40 lb./ac.

Crop: Wheat (Rabi). Ref: I.A.R.I. 52(23). Type: 'CMV'.

Object: To find out the optimum seed-rate of Wheat varieties under manured and unmanured conditions.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3.11.1952. (iv) (a) 3 ploughings with deal plough. Discing and grubbing twice. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A.
(vi) As per treatments. (vii) Irrigated. (viii) Interculture once. (ix) N.A. (x) 15, 20.4.1953.

2. TREATMENTS:
Main-plot treatments:
5 seed rates: R_1=50, R_2=65, R_3=80, R_4=95 and R_5=110 lb./ac.
Sub-plot treatments:
2 varieties: V_1=N.P. 165 and V_2=C-518.
Sub-sub-plot treatments:
2 levels of N as A/S: N_0=0, and N_1=20 lb./ac. of N.
3. DESIGN:
(i) Split-plot in L. Sq. (ii) 5 main-plots/block, 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (ii) 5. (iv) (a) N.A. (b) 62.5'x15'. (v) N.A. (vi) N.A.

4. GENERAL:
(i) Normal. (ii) Loose smut. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) (v) Nil.

5. RESULTS:
(i) 1802 lb./ac. (ii) (a) 1266 lb./ac. (b) 390.0 lb./ac. (c) 391.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R_1</th>
<th>R_2</th>
<th>R_3</th>
<th>R_4</th>
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S.E. of the difference of two
1. R marginal means = 406.3 lb./ac. 6. N means at the same level of R = 174.8 lb./ac.
2. V marginal means = 78.0 lb./ac. 7. R means at the same level of N = 49.0 lb./ac.
3. N marginal means = 78.2 lb./ac. 8. N means at the same level of V = 110.3 lb./ac.
4. V means at the same level of R = 174.4 lb./ac.
5. R means at the same level of V = 418.9 lb./ac.

Crop - Wheat (Rabi), Ref - I.A.R.I. 53(23). Type = 'CMV'.

Object:—To find out the optimum seed-rate of Wheat varieties under manured and unmanured conditions.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) and (b) Refer item II on page 143. (iii) 20, 21.11.1953. (iv) (a) and (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) Weeding once. (ix) N.A. (x) 19, 20.4.1954.

2. TREATMENTS:
All combinations of (1), (2) and (3)
1. 3 varieties: V_1 = NP-710, V_2 = NP-718 and V_3 = NP-775.
2. 3 levels of N as A/S: N_0 = 0, N_1 = 20 and N_2 = 40 lb./ac. of N.
3. 3 seed rates: R_1 = 50, R_2 = 80 and R_3 = 110 lb./ac.
Manures to be applied in two doses, half before sowing on 19.11.1953 and half with first irrigation on 9.1.1954.

3. DESIGN:
(i) 3^2 Fact. confd. (ii) 9 plots/block and 3 blocks/replication, (b) N.A. (iii) 2. (iv) (a) 24'x33' (b) 22'x37'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal, heavy lodging. (ii) Brown rust in N.P.-710. (iii) Grain yield. (iv) (a) N.A.—1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Heavy rains in February 1954. (vii) Nil.
5. RESULTS:

(i) 1867 lb./ac.
(ii) 261.7 lb./ac.
(iii) Main effects of N and V are significant others are not significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of any marginal mean = 61.68 lb./ac.
S.E. of body of any table = 106.80 lb./ac.


Object: To study the effect of N on different varieties of Wheat when sown on different dates.

1. BASAL CONDITIONS:

(i) (a) No. (b) Cowpeas. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 20.10.1950, 16.11.1950 and 9.12.1950. (iv) (a) Ploughing with victory plough after cowpeas once and 1 ploughing with desi plough. (b) to (c) N.A. (v) 30 lb./ac. of P2O5 as super and 20 lb./ac. of K2O as Pot. sol. (vi) As per treatments. (vii) Irrigated. (viii) Roguing 5,6,4.1951. (ix) N.A. (x) 7 to 16.4.1951.

2. TREATMENTS:

Main-plot treatments:

Sub-plot treatments:
3 varieties: V1=N.P-165, V2=N.P-710 and V3=N.P-771.

Sub-sub-plot treatments:
5 levels of N: N0=0, N1=20 lb./ac. of N at sowing, N2=20 lb./ac. of N with 1st irrigation after sowing, N3=40 lb./ac. of N at sowing and N4=40 lb./ac. of N with final irrigation after sowing.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication, 3 sub-plots/main-plot and 5 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 50' ×20'. (v) N.A. (vi) Yes.

4. GENERAL:


5 RESULTS:

(i) 1142 lb./ac.
(ii) (a) 235.2 lb./ac.
(b) 396.1 lb./ac.
(c) 215.0 lb./ac.

(iii) Sub-sub-plot treatments differ highly significantly. Main-plot and sub-sub-plot treatments do not differ significantly. Interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>Mean</th>
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<th>V₃</th>
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<td>1142</td>
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S.E. of difference of two
1. D marginal means = 53.90 lb./ac.
2. V marginal means = 72.31 lb./ac.
3. N marginal means = 51.62 lb./ac.
4. V means at a level of D = 125.25 lb./ac.
5. D means at a level of V = 115.60 lb./ac.

---

Crop: Wheat (Rabi).
Ref: I.A.R.I. 53(11). Type: "IM".

Object: To study the effect of irrigation and manures on the growth, yield and water requirements of Wheat.

1. BASAL CONDITIONS:
(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 11,11,1953.
(iv) (a) 4 ploughing with victory plough, 6 ploughing, with desi plough and double discing with tractor, (b) N.A. (c) 1 ml./ac.
(d) and (e) N.A. (v) N.A. (vi) N.P-710. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 6,7,4,1954.

2. TREATMENTS:
All combinations of (1), (2) and (3).
(i) 3 levels of irrigation: I₁=1, I₂=2 and I₃=3 irrigations.
(ii) 3 levels of N as A/S: N₀=0, N₁=20 and N₂=40 lb./ac. of N.
(iii) 3 levels of P₀ as super: P₀=0, P₁=20 and P₂=40 lb./ac. of P₀₅.

3. DESIGN:
(i) ³² Fact. confd. (ii) (a) 9 plots/block and 3 blocks/replication. (b) [N.A. (iii) 2. (iv) (a) 44'X20' (b) 40'X18' (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Black ants. (iii) Grain yield. (iv) (a) 1953-N.A. (b) N.A. (c) N.A. (v) (a), (b) N.A. (vi) Raw data N.A.

5. RESULTS:
(i) 2174 lb./ac.
(ii) 205.54 lb./ac.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
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<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
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<td>=83.93 lb./ac.</td>
<td>S.E./mean</td>
<td>=83.93 lb./ac.</td>
<td>S.E./mean</td>
<td>=83.93 lb./ac.</td>
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</table>
**Crop:** Wheat (Rabi).  
**Ref:** L.A.R.I. 52(72).  
**Type:** 'IMV'.

**Object:** To study the effect of different doses of N along with different number of Irrigations on three different varieties of Wheat.

1. **BASAL CONDITIONS:**
   - (i) (a) to (c) N.A.
   - (ii) (a) and (b) Refer item 11 on page 143.
   - (iii) 19. 20. 11.1952.  
   - (iv) (a) Tractor grubbing twice, desiploughing, tractor discing crosswise on 18.11.1952.  
   - (b) to (c) N.A.  
   - (v) 80 Ib./ac. of P₂O₅ as super and A/S, applied at the time of sowing.  
   - (vi) As per treatments.  
   - (vii) Irrigated.  
   - (viii) Weeding done with Khurpl.  
   - (ix) N.A. (x) 1.5.1953.

2. **TREATMENTS:**
   - All combinations of (1), (2) & (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 = No manures, N₁ = 20 and N₂ = 40 lb./ac. of N.  
   - (3) 3 levels of irrigation: I₁ = One Irrigation, I₂ = Two Irrigations and I₃ = Three Irrigations.

3. **DESIGN:**
   - (i) 3º Fact. confounded.  
   - (ii) 9 plots/block and 3 blocks/replication.  
   - (iii) 1952.  
   - (iv) (a) Victory ploughing, desiploughing 4 times crosswise 4th week October, 1953.  
   - (v) N.A. (vi) N.A. (vii) As per treatments.  
   - (viii) Weeding.  
   - (ix) N.A. (x) May 1954.

4. **GENERAL:**
   - (i) Below Normal.  
   - (ii) N.A. (iii) Yield of grain.  
   - (iv) (a) 1952 - N.A. (b) N.A. (c) N.A. (v) (a) (b) No. (vi) & (vii) Nil.

5. **RESULTS:**
   - (i) 1639 lb./ac.  
   - (ii) 297.2 lb./ac.  
   - (iii) N effect is highly significant, interaction V × N is significant. Other effects are not significant.  
   - (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
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<th>I₃</th>
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<td>1805</td>
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<td>1724</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 70.05 lb./ac.  
S.E. of body of any table = 121.3 lb./ac.

---

**Crop:** Wheat (Rabi).  
**Ref:** L.A.R.I. 53(72).  
**Type:** 'IMV'.

**Object:** To study the effect of varying doses of irrigation and N doses on the yield of Wheat varieties.

1. **BASAL CONDITIONS:**
   - (i) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143.  
   - (iii) 21.11.1953.  
   - (iv) (a) Victory ploughing, desiploughing 4 times crosswise 4th week October, 1953.  
   - (b) 10' (c) N.A.  
   - (v) N.A. (vi) As per treatments.  
   - (vii) Irrigated.  
   - (viii) Weeding.  
   - (ix) N.A. (x) May 1954.

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. of N.  
   - (3) 3 levels of irrigation: I₁ = One Irrigation, I₂ = Two Irrigations and I₃ = Three Irrigations.

3. **DESIGN:**
   - (i) 3º Fact. confounded.  
   - (ii) 9 plots/block and 3 blocks/replication.  
   - (iii) 1952.  
   - (iv) (a) 48' × 18'.  
   - (b) 48' × 15'.  
   - (v) N.A. (vi) Yes.
4. GENERAL:
(i) Below normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1228 lb./ac.
(ii) 172.5 lb./ac.
(iii) Only V and I effects 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>
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<th>I2</th>
<th>I3</th>
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</table>

S.E. of marginal means = 40.65 lb./ac.
S.E. of the body of the table = 70.41 lb./ac.

Crop: Wheat (Rabi). Ref: I.A.R.I. 48(1). Type: 'D'.

Object: To find out the efficiency of spraying methexan on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil, (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.P-165. (vii) to (x) N.A.

2. TREATMENTS:
Main-plot treatments:
2 levels of spraying: T0 = No spraying before sowing and T1 = Spraying methexan before sowing.

Sub-plot treatments:
4 weeding treatments: W0 = No weeding, W1 = Weeding with hand, W2 = Spraying weedicide once after sowing and W3 = Spraying weedicide twice after sowing.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 36'x36'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1948—N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1245 lb./ac.
(ii) (a) 395.8 lb./ac.
(b) 216.4 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>W0</th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
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</table>
Crop: Maize (Kharif) Ref: I.A.R.I. 49 (3) Type: ‘M’

Object: To Study the residual effect of fertilizers applied to Maize in Kharif on the yield of Wheat.

1. BASEL CONDITIONS:
   (i) (a) Maize-Wheat. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on Page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) & (3)
   (1) 3 levels of N: \( N_0 = 0 \), \( N_1 = 40 \) and \( N_2 = 80 \) lb/ac.
   (2) 3 levels of \( P_0 = 0 \), \( P_1 = 40 \) and \( P_2 = 80 \) lb/ac.
   (3) 2 levels of \( K_0 = 0 \), and \( K_1 = 60 \) lb/ac.

3. DESIGN:
   (i) \( 3^2 \times 2 \) Conf. Fact. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPK are partially confounded.) (b) N.A. (iii) 2. (iv) (a) N.A. (b) 42’x22’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 (Kharif) to 1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) & (vii) Nil.

5. RESULTS:
   (i) 2427 lb/ac.
   (ii) 396.6 lb/ac.
   (iii) N effect alone is significant.
   (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
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<th>( K_1 )</th>
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</table>

S.E. of N or P marginal means = 114.5 lb/ac.
S.E. of K marginal means = 93.5 lb/ac.
S.E. of body of N x P table = 225.0 lb/ac.
S.E. of body of N x K or P x K tables = 161.9 lb/ac.
Crop :- Maize (Kharif).  
Ref :- I.A.R.I. 50(58).  
Type :- ‘M’.

Object :- To study the residual effect of fertilizers applied to Maize in kharif on the yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Maize-Wheat. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3.7.1950. (iv) (a) Ploughing with victory plough twice. (b) to (e) N.A. (v) Yellow No. 2. (vi) Irrigated. (vii) Thinning, horse hoeing, weeding twice and earthing up. (b) N.A. (x) 4.10.1950.

2. TREATMENTS :
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A/S : N₀=0, N₁=40 and N₂=80 lb./ac.
   (2) 3 levels of P₂O₅ as Super : P₀=0, P₁=40 and P₂=80 lb./ac.
   (3) 2 levels of K₂O as Pot. Sul : K₀=0 and K₁=60 lb./ac.

3. DESIGN :
   (i) 3×2 Conf. Fac. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPK are partially confounded). (b) N.A. (iii) 2. (iv) (a) 42’×22’. (b) 37’×19’. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Spraying maize crop with D.D.T. (iii) Grain yield, (iv) (a) 1949 (kharif)—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :
   (i) 2069 lb./ac.
   (ii) 281.4 lb./ac.
   (iii) Main effect of N is highly significant. Interactions N×P and N×K are significant. Others are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
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<th>K₁</th>
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S.E. of N or P marginal mean = 81.2 lb./ac.
S.E. of K marginal mean = 66.3 lb./ac.
S.E. of body of N×P table = 162.4 lb./ac.
S.E. of body of P×K or N×K table = 114.9 lb./ac.

Crop :- Maize (Kharif).  
Ref :- I.A.R.I. 51(59).  
Type :- ‘M’.

Object :- To study the residual effect of fertilizers applied to Maize in kharif on the yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Maize-Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 31.7.1951. (iv) (a) Ploughing with victory plough, tractor discing and tractor grubbing (b) to (e) N.A. (v) N.A. (vi) Yellow No. 2. (vii) Irrigated. (viii) Horse hoeing, weeding and earthing up. (b) N.A. (x) 4.11.1951.

2. TREATMENTS :
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A/S : N₀=0, N₁=40 and N₂=80 lb./ac.
   (2) 3 levels of P₂O₅ as Super : P₀=0, P₁=40 and P₂=80 lb./ac.
   (3) 2 levels of K₂O as Pot. Sul : K₀=0 and K₁=60 lb./ac.
3. DESIGN:
(i) 3\times2 Conf. Fact. (ii) (a) 3 blocks/replication and 6 plots/blocks. (NP and NPK are partially confounded). (b) N.A. (iii) 2. (iv) (a) N.A. (b) 42'\times22'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 (Kharif)—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>K₀</th>
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<td>N₁</td>
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<td>2339</td>
<td>1750</td>
<td>1805</td>
<td>1909</td>
<td>1701</td>
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<td>2092</td>
<td>2233</td>
<td>2112</td>
<td>2005</td>
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<tr>
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<td>1848</td>
<td>1722</td>
<td>1685</td>
<td>1653</td>
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<tr>
<td>K₀</td>
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<td>1890</td>
<td>1748</td>
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<tr>
<td>K₁</td>
<td>1650</td>
<td>1807</td>
<td>1697</td>
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</table>

S.E. of N or P marginal mean = 87.4 lb./ac.
S.E. of K marginal mean = 71.4 lb./ac.
S.E. of body of N\times P table = 174.8 lb./ac.
S.E. of body of N\times K or P\times K table = 123.6 lb./ac.

Crop : Maize (Kharif).

Ref : I.A.R.I. 52(75). Type :- 'M'.

Object :- To study the residual effect of fertilizers applied to Maize in Kharif on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Maize—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.7.1952. (iv) (a) Ploughing with victory plough and distress plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Bullock hoeing, weeding and earthing up. (ix) N.A. (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(i) 3 levels of N : N₀=0, N₁=40 and N₂=80 lb./ac.
(ii) 3 levels of P₀ : P₀=0, P₁=40 and P₂=80 lb./ac.
(iii) 2 levels of K₀ : K₀=0 and K₁=60 lb./ac.

3. DESIGN:
(i) 3\times2 Conf. Fact. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPK are partially confounded). (b) N.A. (iii) 2. (iv) (a) N.A. (b) 42'\times22'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 (Kharif)—1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Crop suffered a lot due to utter failure of rains in September. (vii) Nil.

5. RESULTS:
(i) 1045 lb./ac.
(ii) 346.4 lb./ac.
(iii) Only main effect of N differs highly significantly.
(iv) Av. yield of grain 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>
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<td>1163</td>
<td>1101</td>
<td>1045</td>
<td>985</td>
<td>1106</td>
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<td>1159</td>
<td>1048</td>
<td>1110</td>
<td>1159</td>
<td>1048</td>
</tr>
</tbody>
</table>

S.E. of N or P marginal mean = 100.0 lb./ac.
S.E. of K marginal mean = 81.6 lb./ac.
S.E. of body of N X P table = 20.0 lb./ac.
S.E. of body of P X K or N X K table = 141.4 lb./ac.

Crop: Maize (Kharif).
Ref: L.A.R.I. 53(74). Type: 'M'.

Object: To study the residual effect of fertilizers applied to Maize in kharif on the yield of Wheat.

1. Basal Conditions:
   (i) (a) Maize—Wheat. (b) Wheat. (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.7.1953.

2. Treatments:
   All combinations of (1), (2) and (3).
   (1) 3 levels of N as C/N.: N₀=0, N₁=40 and N₂=80 lb./ac.
   (2) 3 levels of P₂O₅ as Super: P₀=0, P₁=40 and P₂=80 lb./ac.
   (3) 2 levels of K₂O as Pot. Sui.: K₀=0 and K₁=60 lb./ac.

3. Design:
   (i) 3 x 2 Conf./Fact. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPK are partially confounded).
   (b) N.A.  (iii) 2. (iv) (a) N.A.  (b) 42'×22'. (v) N.A.  (vii) Yes.

4. General:
   (i) N.A.  (ii) N.A.  (iii) Grain yield. (iv) (a) 1949 (kharif)—1953. (b) Yes.  (c) N.A.  (v) (a), (b) No.
   (vi) and (vii) Nil.

5. Results:
   (i) 1400 lb./ac.
   (ii) 423.2 lb./ac.
   (iii) N effect is highly significant. Interaction N X K is significant. Others are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>K₀</th>
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<td>706</td>
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<td>1469</td>
<td>1400</td>
<td>1471</td>
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</table>
Crop: Maize (Kharif). Type: 'M'.

Object: To study the response of barley to different doses of N and P and its residual effect on Maize fodder.

1. BASAL CONDITIONS:
(i) (a) Barley-Maize. (b) Barley. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.7.1952. (iv) (a) Ploughing with victory plough and preparing the field. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) Hosing on 25.8.1952. (ix) N.A. (x) 15.10.1952 to 19.10.1952.

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 levels of P2O5: P0 = 0, P1 = 30 and P2 = 60 lb./ac.
(3) 2 varieties: V1 = Pusa-13 and V2 = Kanpur-251.

3. DESIGN:
(i) 3'x2 Fact. Conf'd. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPV are partially confounded). (b) N.A. (iii) 4. (iv) (a) 38'x25'. (b) 36'x23'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1951 to N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 6.51 ton/ac.
(ii) 1.027 ton/ac.
(iii) Levels of N differ highly significantly, interaction P×V is significant. Others are not significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
<th>V1</th>
<th>V2</th>
</tr>
</thead>
<tbody>
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<td>6.70</td>
<td>6.49</td>
<td>6.91</td>
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<td>6.03</td>
<td>5.80</td>
<td>7.43</td>
<td>6.42</td>
<td>6.40</td>
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<td>P2</td>
<td>6.16</td>
<td>6.64</td>
<td>7.04</td>
<td>6.61</td>
<td>6.13</td>
</tr>
<tr>
<td>Mean</td>
<td>6.13</td>
<td>6.34</td>
<td>7.06</td>
<td>6.51</td>
<td>6.48</td>
</tr>
<tr>
<td>V1</td>
<td>5.87</td>
<td>6.63</td>
<td>6.94</td>
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</tr>
<tr>
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<td>6.39</td>
<td>6.06</td>
<td>7.17</td>
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</tbody>
</table>

S.E. of N or P marginal mean = 0.296 ton/ac.
S.E. of V marginal mean = 0.242 ton/ac.
S.E. of body of N×P table = 0.592 ton/ac.
S.E. of body of N×V or P×V table = 0.419 ton/ac.
Crop: Maize (Kharij).  
Ref: I.A.R.I. 53 (76).  
Type: 'M'.

Object: To study the response of different doses of N and P on barley varieties and residual effect on Maize fodder.

1. BASAL CONDITIONS:
   (i) (a) Barley-Maize. (b) Barley. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143.  
   (iii) 6.6.1953 and 9.6.1953. (iv) (a) Dry ploughing with victory plough and with desi plough. (b) to (e) N.A.  

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N₁=0, N₂=20 and N₃=40 lb/ac.  
   (2) 3 levels of P₁₀₁: P₁₀₁=0, P₁=30 and P₁=60 lb/ac.  
   (3) 2 varieties: V₁=Pusa N.P.13 and V₂=Kanpur-251.

3. DESIGN:
   (i) 3²×2 Cond. Fact. (ii) (a) 3 blocks/replication and 6 plots/block. (NP and NPV are partially confounded).  
   (b) N.A.  
   (iii) 4. (iv) (a) 30'×25'. (b) 36'×23'. (v) N.A.  
   (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A.  
   (iii) Fodder yield. (iv) (a) 1951 (Rabi)—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 7.83 ton/ac.  
   (ii) 0.65 ton/ac.  
   (iii) Main effects N and P are significant. Others are not significant.  
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₃</th>
<th>Mean</th>
<th>V₁</th>
<th>V₂</th>
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<td>8.69</td>
<td>8.06</td>
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<td>8.16</td>
<td>7.81</td>
<td>7.62</td>
<td>7.44</td>
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<td>P₃</td>
<td>7.36</td>
<td>7.72</td>
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<td>7.75</td>
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<td>7.77</td>
<td>7.71</td>
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S.E. of N or P marginal mean = 0.13 ton/ac.  
S.E. of V marginal mean = 0.11 ton/ac.  
S.E. of body of N×P table = 0.22 ton/ac.  
S.E. of body of N×V or P×V table = 0.15 ton/ac.

Crop: Maize (Kharij).  
Ref: I.A.R.I. 52(7).  
Type: 'M'.

Object: To study the residual effect of phosphatic manuring of berseem with and without K and N on Maize.

1. BASAL CONDITIONS:
   (i) (a) Maize—Berseem—Cotton—Wheat. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143.  
   (iii) 13, 15.7.1952. (iv) (a) Ploughing with victory plough and with desi plough.  
   (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hand hoeing, bullock hoeing and earthing up.  
   (x) N.A. (x) 18.10.1952.
2. TREATMENTS:
1. 0 lb./ac. of N + 0 lb./ac. of P\textsubscript{2}O\textsubscript{5} + 0 lb./ac. of K\textsubscript{2}O (Control).
2. 0 lb./ac. of N + 120 lb./ac. of P\textsubscript{2}O\textsubscript{5} + 0 lb./ac. of K\textsubscript{2}O.
3. 0 lb./ac. of N + 120 lb./ac. of P\textsubscript{2}O\textsubscript{5} + 120 lb./ac. of K\textsubscript{2}O.
4. 100 lb./ac. of N + 120 lb./ac. of P\textsubscript{2}O\textsubscript{5} + 0 lb./ac. of K\textsubscript{2}O.
5. 25 lb./ac. of N + 120 lb./ac. of P\textsubscript{2}O\textsubscript{5} + 0 lb./ac. of K\textsubscript{2}O.
6. 50 lb./ac. of N + 120 lb./ac. of P\textsubscript{2}O\textsubscript{5} + 0 lb./ac. of K\textsubscript{2}O.
7. 100 lb./ac. of N + 120 lb./ac. of P\textsubscript{2}O\textsubscript{5} + 120 lb./ac. of K\textsubscript{2}O.
8. Fallow in berseem season.

Source of fertilizers N.A. Treatments applied to berseem in Rabi 1951-1952.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×18'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS:
(i) 1557 lb./ac.
(ii) 254.3 lb./ac.
(iii) Treatments differ highly significantly.
(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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</tr>
<tr>
<td>2.</td>
<td>1508</td>
</tr>
<tr>
<td>3.</td>
<td>1613</td>
</tr>
<tr>
<td>4.</td>
<td>1702</td>
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</tbody>
</table>

S.E./mean = 103.8 lb./ac.

Crop: Maize (Kharif).
Ref: I.A.R.I. 50(43).
Type: 'M'.

Object: To study the effect of green manuring on Maize.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 15, 16.7.1950. (iv) (a) Ploughing with deep plough twice. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) No. (viii) Horse hoeing, hand hoeing and thinning. (ix) 0.7'. (x) 25, 26.10.1950.

2. TREATMENTS:
Main-plot treatments: 8 G.M. crops: G\textsubscript{1}=Berseem, G\textsubscript{2}=Senji, G\textsubscript{3}=Methra, G\textsubscript{4}=Khesari, G\textsubscript{5}=Gram, G\textsubscript{6}=Peas, G\textsubscript{7}=Lentil and G\textsubscript{8}=Fallow (control).
Sub-plot treatments: 2 levels of P\textsubscript{2}O\textsubscript{5} as Super: P\textsubscript{2}=Control (no P\textsubscript{2}O\textsubscript{5}) and P\textsubscript{1}=80 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 8 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 acre. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1277 lb./ac.
(ii) (a) 207.0 lb./ac.
(b) 724.5 lb./ac.
(iii) P effect alone is significant.
Crop: Maize (Kharif).

Object: To determine the interval between application of F.Y.M. and sowing of wheat to obtain the maximum yield.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 11.6.1953 and 11.6.1953. (iv) (a) Dry ploughing with victory plough, land prepared with steel plough twice. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Hoeing with steel plough and weeding. (ix) N.A. (x) 17.8.1953 to 22.8.1953.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2) + a control (T1F0)
   (1) 4 times of application of F.Y.M.: T1=3 months, T2=2 months, T3=1 month and T4=1 week before sowing.
   (2) 3 levels of F.Y.M.: F1=2.5, F2=5 and F3=10 ton/ac.
   Sub-plot treatments:
   2 levels of N as A/S: N0=0 and N1=10 lb/ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 13 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 18’x32.’ (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Fodder yield. (iv) (a) 1952—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 9.77 ton/ac.
   (ii) 4.69 ton/ac.
   (b) 1.48 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of fodder in ton/ac.

   |   | T0F0 | T1F0 | T0F1 | T1F1 | T0F2 | T1F2 | T0F3 | T1F3 | T0F4 | T1F4 | T0F5 | T1F5 | T0F6 | T1F6 | T0F7 | T1F7 | T0F8 | T1F8 | T0F9 | T1F9 | Mean |
| N1 | 7.13 | 6.71 | 10.34 | 10.95 | 11.45 | 10.65 | 9.60 | 10.68 | 10.21 | 8.74 | 9.52 | 11.25 | | | | | | | | 9.76 |
S.E. of difference of two means:
2. Sub-plot treatment means = 0.290 ton/ac.
3. Sub-plot treatment means at the same level of main-plot treatment mean = 1.045 ton/ac.
4. Main-plot treatment means at the same level of sub-plot treatment mean = 2.459 ton/ac.


Object: To study the residual effect of manures applied to wheat on Maize.

1. BASAL CONDITIONS:
   (i) Wheat—Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 4.7.1951. (iv) (a) Tractor ploughing and tractor discing. Bullock ploughing with desi plough and beamig 3.7.1951. (b) to (c) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Hoeing, thinning and weeding. (ix) 6.11.1951.

2. TREATMENTS:
   Main-plot treatments:
   - M0 = No manure, M1 = Green manuring with guar at 60 lb./ac. of N, M2 = Castor cake at 60 lb./ac. of N and M3 = F.Y.M. at 60 lb./ac. of N.
   Sub-plot treatments:
   - 5 doses of fertilizer: T0 = No manure, T1 = A/S at 40 lb./ac. of N, T2 = Super at 80 lb./ac. of P2O5, T3 = A/S at 40 lb./ac. of N + Super at 80 lb./ac. of P2O5 and T4 = A/S at 4 lb./ac. of N + Super at 80 lb./ac. of P2O5 + 60 lb./ac. of K2O as Pot. Sul.

3. DESIGN:
   (i) Split-plot. (ii) 4 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 51' x 24'. (v) 48' x 22'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Poor. (ii) Slight attack of mildew and short stem-borer. (iii) Grain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 302.2 lb./ac.
   (ii) 384.5 lb./ac.
   (b) 135.8 lb./ac.
   (iii) Only M effect 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>179.4</td>
<td>553.0</td>
<td>213.9</td>
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<td>T1</td>
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<td>532.4</td>
<td>286.3</td>
<td>219.7</td>
<td>317.4</td>
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<td>377.7</td>
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<td>T3</td>
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<td>T4</td>
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<td>512.6</td>
<td>226.3</td>
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<tr>
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<td>203.1</td>
<td>487.3</td>
<td>251.4</td>
<td>266.9</td>
<td>302.2</td>
</tr>
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</table>

S.E. of difference of two means:
1. M marginal means = 9.22 lb./ac.
2. T marginal means = 39.20 lb./ac.
3. T means at the same level of M = 78.40 lb./ac.
4. M means at the same level of T = 121.50 lb./ac.
Crop :- Maize (Kharif).

Ref :- I.A.R.I. 53(51).

Type :- 'M'.

Object :- To study the effect of organic manures and fertilizers on the yield of crops in the rotation Wheat-Maize-Wheat.

1. BASAL CONDITIONS :
   (i) (a) Wheat-Maize-Wheat. (b) Wheat (manured). (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.6.1953. (iv) (a) Ploughing with victory plough, ploughing with desi plough and beaming (b) to (e) N.A. (vi) Yellow No. 2. (vii) Hoisting by desi plough, thinning, hoisting by horse-hoe and hand weeding. (ix) 15.81'. (x) 6.10.1953.

2. TREATMENTS :
   Main-plot treatments :
   4 organic manures: M₀=No manure, M₁=Gur as G.M., M₂=Castor cake at 60 lb./ac. of N and M₃=F.Y.M.
   Sub-plot treatments :
   5 fertilizers: T₀=No fertilizer, T₁=40 lb./ac. of N as A/S, T₂=80 lb./ac. of P₂O₅ as Super, T₃=60 lb./ac. of N as A/S+80 lb./ac. of P₂O₅ as Super and T₄=40 lb./ac. of N as A/S+80 lb./ac. of P₂O₅ as Super+60 lb./ac. of K₂O as Pot. Sul.

Manures applied to wheat crop in 1952.

3. DESIGN :
   (i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 5' × 24'. (b) 48' × 22'. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Poor to fair. No lodging. (ii) Slight attack of stem borer. (iii) Rain yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a) and (b) N.O. (vi) and (vii) Nil.

5. RESULTS :
   (i) 500.4 lb./ac.
   (ii) 552.1 lb./ac.
   (b) 144.8 lb./ac.
   (iii) M effect is significant and T effect is highly significant, while interaction is not 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>
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<td>490.4</td>
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<td>T₄</td>
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<td>999.4</td>
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<td>553.0</td>
<td>571.5</td>
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<td>320.6</td>
<td>726.2</td>
<td>427.4</td>
<td>527.5</td>
<td>500.4</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. Main-plot treatment means
2. Sub-plot treatment means
3. Main-plot treatment means at the same level of main-plot treatment
4. Main-plot treatment means at the same level of sub-plot treatment

=142.6 lb./ac.

=161.0 lb./ac.
2. TREATMENTS:
1. No manure.
2. 40 lb./ac. of N as F.Y.M.
3. 60 lb./ac. of N as F.Y.M.
4. 80 lb./ac. of N as F.Y.M.
5. 100 lb./ac. of N as F.Y.M.
6. 120 lb./ac. of N as F.Y.M.
7. 20 lb./ac. of N as G.N.C.
8. 40 lb./ac. of N as G.N.C.
9. 60 lb./ac. of N as G.N.C.
10. 80 lb./ac. of N as G.N.C.
11. 20 lb./ac. of N as A/S.
12. 40 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 8. (iv) (a) 33’x22’. (b) 31’x20’. (v) 1’ on each side. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Fodder yield. (iv) (a) 1949—1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 10.45 ton/acre.
(ii) 2.95 ton/acre.
(iii) Treatments do not differ significantly.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<td>10.71</td>
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<td>8.</td>
<td>10.17</td>
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<tr>
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<td>10.39</td>
<td>9.</td>
<td>10.58</td>
</tr>
<tr>
<td>4.</td>
<td>9.36</td>
<td>10.</td>
<td>11.63</td>
</tr>
<tr>
<td>5.</td>
<td>9.38</td>
<td>11.</td>
<td>10.30</td>
</tr>
<tr>
<td>6.</td>
<td>11.20</td>
<td>12.</td>
<td>10.77</td>
</tr>
</tbody>
</table>

S.E./mean=1.04 ton/acre.

Crop : Maize (Khara).
Ref : I.A.R.I. 52/35. Type : 'M'.

Object : To study the residual effect of different phosphatic manures on Maize.

1. BASAL CONDITIONS:
(i) (a) No. (b) Berseem. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.6.1952. (iv) (a) Ploughing with victory and desi plough. (b) to (e) N.A. (v) N.A. (vi) Irrigated. (vii) Hoeing with oudh plough. (ix) N.A. (x) 19, 20, 6.1952.

2. TREATMENTS:
3. A/S.
4. B.M.
5. Bone Super.
7. Magnesium phosphate.
8. Reno hyper phosphate.
10. Selecto phosphate.
12. Control.

Fertilizers are applied to give 80 lb. P₂O₅ or 80 lb./ac. of N. These treatments were applied to berseem in 1950.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 17’x64’. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Fodder yield. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 15.31 ton/acre.
(ii) 2.40 ton/acre.
(iii) Treatments do not differ significantly.
Crop: Maize (Kharif).  
Type: 'M'.

Object: To study the response of berseem to fertilizers and comparing the residual effects with direct manuring of cereals.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 7.7.1951 and Resown on 2.8.1951.
   (iv) (a) 2 tractor discings and ploughing with desi spring harrow twice. (b) to (e) N.A. (v) 40 lb./ac. of N as A/S. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 27 to 30.9.1951.

2. TREATMENTS:
   1. No manure.
   2. Super at 120 lb./ac. of P2O5.
   3. A/S at 40 lb./ac. of N+Super at 120 lb./ac. of P2O5.
   4. A/S at 40 lb./ac. of N+Super at 20 lb./ac. of P2O5+Pot. Sul. at 80 lb./ac. of K2O.
   5. Super at 20 lb./ac. of P2O5+Pot. Sul. at 80 lb./ac. of K2O.
   6. Fallow in previous season.

3. DESIGN:
   (i) L. Sq. (ii) 3. (b) N.A. (iii) 3. (iv) (a) 84'×26'. (b) 78'×20'. (v) 3' on each side. (vi) Yes.

4. GENERAL:
   (i) Poor. (ii) Nil. (iii) Fodder yield. (iv) (a) 1950—N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 7.64 ton/ac.
   (ii) 10.56 ton/ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>8.23</td>
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<tr>
<td>2.</td>
<td>7.78</td>
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<td>3.</td>
<td>7.64</td>
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<tr>
<td>4.</td>
<td>7.98</td>
</tr>
<tr>
<td>5.</td>
<td>7.40</td>
</tr>
<tr>
<td>6.</td>
<td>7.01</td>
</tr>
</tbody>
</table>

S.E./mean = 4.31 ton/ac.

Crop: Maize (Kharif).  
Reference: I.A.R.I. 52(43).  
Type: 'M'.

Object: To study the influence of compost on humus formation and on crop yield.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.7.1952.
   (iv) (a) Ploughing with victory plough and preparing the field. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding, hoeing and thinning. (ix) N.A. (x) 10.11.1952 to 15.11.1952.
2. TREATMENTS:
1. No manure.
2. Compost (plastered trench) at 40 lb./ac. of N.
3. Compost (plastered trench) at 80 lb./ac. of N.
4. Compost (plastered trench) at 120 lb./ac. of N.
5. Compost (over ground heap) at 40 lb./ac. of N.
6. Compost (over ground heap) at 80 lb./ac. of N.
7. Compost (over ground heap) at 120 lb./ac. of N.
8. Compost (exposed pit) at 40 lb./ac. of N.
9. Compost (exposed pit) at 80 lb./ac. of N.
10. Compost (exposed pit) at 120 lb./ac. of N.
11. A/S at 20 lb./ac. of N.
12. A/S at 40 lb./ac. of N.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 24.6' x 30'. (b) 22.6' x 28'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 (Kharif) — N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 949 lb./ac.
(ii) 438.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<td>580</td>
<td>12.</td>
<td>1079</td>
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<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td>-178.8 lb./ac.</td>
</tr>
</tbody>
</table>

Crop:— Maize (Kharif). Ref:— I.A.R.I. 53(45). Type:— 'M'.

Object— To study the influence of compost on humus formation and on crop yield.

1. BASAL CONDITIONS:
(i) (a) Maize— Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.6.1953. (iv) (a) Land prepared with desi plough thrice. Soaking dose given. (b) to (e) N.A. (v) N.A. (vi) Irrigated. (vii) Weeding and hoeing. (i) N.A. (x) 2 to 4.10.1953.

2. TREATMENTS:
1. No manure.
2. Compost (plastered trench) at 40 lb./ac. of N.
3. Compost (plastered trench) at 80 lb./ac. of N.
4. Compost (plastered trench) at 120 lb./ac. of N.
5. Compost (over ground heap) at 40 lb./ac. of N.
6. Compost (over ground heap) at 80 lb./ac. of N.
7. Compost (over ground heap) at 120 lb./ac. of N.
8. Compost (exposed pit) at 40 lb./ac. of N.
9. Compost (exposed pit) at 80 lb./ac. of N.
10. Compost (exposed pit) at 120 lb./ac. of N.
11. A/S at 20 lb./ac. of N.
12. A/S at 40 lb./ac. of N.


3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 24.5' x 30'. (b) N.A. (x) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952 (Kharif) — N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1100 lb./ac.
(ii) 302.8 lb./ac.
(iii) Treatments differ significantly.
Crop: Maize (Kharif).  Ref: - I.A.R.I. 50(17). Type: - 'M'.

Object: - To study the effect of placement of fertilizers on yield of Maize and its residual effect on Oats.

1. BASAL CONDITIONS:
(i) (a) No. (b) to (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 28 and 29.7.1950.  (iv) (a) Ploughing with double desi plough, ploughing with tractor, grubbing, beaming and harrowing twice.  (b) to (e) N.A.  (v) Nil.  (vi) N.A.  (vii) Irrigated.  (viii) Hoeing with horse hoe and weeding.  (ix) N.A.  (x) 23.11.1950.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 methods of application of fertilizers: M₁=Broadcasting of fertilizers, M₂=Fertilizers placed 2" deep in the seed line and M₃=Fertilizers placed 4" deep in the seed line.
(2) 3 levels of P₂O₅ as Super: P₁=40 lb./ac., P₂=60 lb./ac. and P₃=120 lb./ac.
(3) 3 levels of N as A/S: N₁=20 lb./ac., N₂=30 lb./ac. and N₃=60 lb./ac.

3. DESIGN:
(i) 3 treatments (ii) (a) S. (b) N.A.  (iii) 2.  (iv) (a) N.A.  (b) 128/×128, 12.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Very adversely affected by water logging and weeds.  (ii) Mild attack of borer.  (iii) Grain yield.  (iv) (a) 1949–1950.  (b) No.  (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
(i) 361.2 lb./ac.
(ii) 153.98 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<td>12.</td>
<td>1454</td>
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S.E./mean =123.6 lb./ac.

<table>
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<th>N₂</th>
<th>N₃</th>
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<th>M₁</th>
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<td>P₁</td>
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<td>376.6</td>
<td>351.6</td>
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<td>378.9</td>
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<tr>
<td>P₂</td>
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<td>401.6</td>
<td>399.3</td>
<td>350.9</td>
<td>406.1</td>
<td>270.0</td>
<td>376.6</td>
</tr>
<tr>
<td>P₃</td>
<td>360.7</td>
<td>267.7</td>
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<td>384.9</td>
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<td>478.7</td>
<td>349.4</td>
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<tr>
<td>Mean</td>
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<td>348.6</td>
<td>425.7</td>
<td>361.2</td>
<td>353.2</td>
<td>362.2</td>
<td>368.3</td>
</tr>
</tbody>
</table>

S.E. of any marginal means =16.29 lb./ac.
S.E. of body of any table =62.86 lb./ac.
Crop: Maize (Kharif).  

Ref: I.A.R.I. 51(1).  

Type: 'M'.

Object: To study the effect of placement of fertilizers on yield of Maize and its residual effect on oats.

1. BASAL CONDITIONS:

(i) (a) No.  (b) and (c) N.A.  
(ii) (a) and (b) Refer item 11 on page 143.  
(iii) 4.7.1951.  
(iv) (a) Ploughing with tractor, discing twice and burning.  
(b) to (e) N.A.  
(v) N.A.  
(vi) Irrigated.  
(vii) Hoeing and weeding.  

2. TREATMENTS:

All combinations of (1), (2), and (3)

(1) 3 methods of application of fertilizers: 
M1 = Broadcasting of fertilizers, 
M2 = Fertilizers placed 2½" deep in the seed line and 
M3 = Fertilizers placed 4½" deep in the seed line.

(2) 3 levels of P2O5 as Super: 
P1 = 40 lb./ac.,  
P2 = 60 lb./ac. and  
P3 = 120 lb./ac.

(3) 3 levels of N as A/S: 
N1 = 10 lb./ac.,  
N2 = 30 lb./ac. and  
N3 = 60 lb./ac.

3. DESIGN:

(i) 3³ Cond. Fact.  
(ii) (a) 9 plots/block; 3 blocks/replication.  
(b) N.A.  
(iii) 2.  
(iv) (a) 109'x10'.  
(b) 105'x6'.  
(v) 2' on each side.  
(vi) Yes.

4. GENERAL:

(i) Poor.  
(ii) N.A.  
(iii) Grain yield.  
(iv) (a) 1949-1951.  
(b) N.A.  
(c) N.A.  
(v) (a) and (b) No.  
(vi) and (vii) Nil.

5. RESULTS:

(i) 1161 lb./ac.  
(ii) 205.2 lb./ac.

(iii) Only levels of N differ highly significantly.

(iv) Av. yield of grain in 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>1096</td>
<td>1027</td>
<td>1331</td>
<td>1151</td>
<td>1155</td>
<td>1161</td>
</tr>
<tr>
<td>P2</td>
<td>1084</td>
<td>1110</td>
<td>1259</td>
<td>1151</td>
<td>1106</td>
<td>1343</td>
</tr>
<tr>
<td>P3</td>
<td>1007</td>
<td>1049</td>
<td>1465</td>
<td>1180</td>
<td>1055</td>
<td>1269</td>
</tr>
<tr>
<td>Mean</td>
<td>1062</td>
<td>1062</td>
<td>1358</td>
<td>1161</td>
<td>1085</td>
<td>1258</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean: 
=48.37 lb./ac.

S.E. of body of any table: 
=83.77 lb./ac.

---

Crop: Maize (Kharif).  

Ref: I.A.R.I. 50(5).  

Type: 'M'.

Object: To study soil fertility building by manuring berseem in berseem-guar-berseem-wheat-maize rotation.

1. BASAL CONDITIONS:

(b) Guar.  
(c) N.A.  
(ii) (a) and (b) 
Refer item 11 on page 143.  
(iii) 31.7.1950.  
(iv) (a) Ploughing with tractor, grubbing, ploughing with victory plough, and harrowing across.  
(b) to (e) N.A.  
(v) Nil.  
(vi) N.A.  
(vii) Irrigated.  
(viii) Hoeing with hand hoe.  
(ix) 13.19'.  
(x) 31.10.1950.
2. TREATMENTS:
1. No manure.
2. Super at 50 lb./ac. of P₂O₅.
3. Super at 100 lb./ac. of P₂O₅.
4. Super at 50 lb./ac. of P₂O₅ +80 lb./ac. of K₂O.
5. Super at 100 lb./ac. of P₂O₅ +80 lb./ac. of K₂O.
Manures applied to previous crop of berseem.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) 60'×27'. (b) 58'×25'. (v) 1' on each side. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Mild attack of borer. (iii) Fodder yield. (iv) (a) 1946—1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 3.86 ton/ac.
(ii) 0.64 ton/ac.
(iii) Treatments differ significantly.
(iv) Av. yield of fodder in ton/ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3.75</td>
</tr>
<tr>
<td>2.</td>
<td>2.48</td>
</tr>
<tr>
<td>3.</td>
<td>4.60</td>
</tr>
<tr>
<td>4.</td>
<td>4.61</td>
</tr>
<tr>
<td>5.</td>
<td>1.75</td>
</tr>
</tbody>
</table>
S.E./mean = 0.37 ton/ac.

Crop = Maize (Kharti).  Ref = L.A.R.I. 52(14).  Type = 'M'.

Object = To study the building of soil fertility through organic and artificial fertilizers in a legume rotation.

1. BASAL CONDITIONS:
(i) (a) Maize—Wheat—Maize—Peas. (b) and (c) N.A. (ii) (a) and (b) Refer item II on page 143. (iii) 19.7.1952. (iv) (a) Dry victory ploughing, irrigated before sowing. Land prepared twice with desti plough. (b) to (e) N.A. (vi) and (vii) N.A. (viii) 2 weedings and 2 hoeings. (ix) N.A. (x) 21.10.1952 to 23.10.1952.

2. TREATMENTS:
1. Control.
2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅.
3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅ + Pot. Sul. at 100 lb./ac. of K₂O.
4. F.Y.M. at 60 lb./ac. of N+Super at 60 lb./ac. of P₂O₅ + Pot. Sul. at 100 lb./ac. of K₂O.
5. Castor cake at 60 lb./ac. of N+Super at 60 lb./ac. of P₂O₅ + Pot. Sul. at 100 lb./ac. of K₂O.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 38'×29'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes (except in 1956 Rabi). (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 615 lb./ac.
(ii) 173 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>499</td>
</tr>
<tr>
<td>2.</td>
<td>535</td>
</tr>
<tr>
<td>3.</td>
<td>653</td>
</tr>
<tr>
<td>4.</td>
<td>524</td>
</tr>
<tr>
<td>5.</td>
<td>466</td>
</tr>
</tbody>
</table>
S.E./mean = 70.87 lb./ac.
Crop: Maize (Kharif). Ref: I.A.R.I. (52)6$. Type: 'M'.
Object: To study the response of Maize to seed soaking.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 26, 28.7.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) Maize yellow. (vii) N.A. (viii) Horse hoeing and weeding with kharpi. (x) N.A. (x) Middle of Oct. 1952.

2. TREATMENTS:
   1. No soaking.
   2. Soaking seed in 5% A/S sol.
   3. Soaking seed in 5% Super sol. (neutralized with lime).
   4. Soaking seed in 5% Ammon. Phos. sol.
   5. Soaking seed in water.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 36'x33'. (b) 34'x31'. (v) on each side. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1951-1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1435 lb./ac.
   (ii) 148.3 lb./ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of grain in lb./ac.
   | Treatment | Av. yield |
   | 1.        | 1407      |
   | 2.        | 1342      |
   | 3.        | 1572      |
   | 4.        | 1522      |
   | 5.        | 1434      |
   S.E./mean = 60.54 lb./ac.

Crop: Maize (Kharif). Ref: I.A.R.I. 53(58). Type: 'M'.
Object: To study the response of Maize to seed soaking.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Oats. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 22.7.1953. (iv) (a) Disc ploughing 4 times cross wise. (b) to (e) N.A. (v) Nil. (vi) Maize yellow. 2. (vii) Unirrigated. (viii) Gap filling and horse hoeing. (x) N.A. (x) 4th week of Oct. 1953.

2. TREATMENTS:
   1. No soaking of seeds.
   2. Soaking seed in 5% sol. of A/S.
   3. Soaking seed in 5% sol. of Super.
   4. Soaking seed in 5% sol. of Ammon. Phos.
   5. Soaking seed in water.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/47 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Bird attack. (iii) Grain yield. (iv) (a) 1951-1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1515 lb./ac.
   (ii) 181.9 lb./ac.
   (iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1348</td>
</tr>
<tr>
<td>2.</td>
<td>1498</td>
</tr>
<tr>
<td>3.</td>
<td>1654</td>
</tr>
<tr>
<td>4.</td>
<td>1654</td>
</tr>
<tr>
<td>5.</td>
<td>1420</td>
</tr>
</tbody>
</table>

S.E./mean = 74.26 lb./ac.

Crop : Maize (Kharif).
Ref: I.A.R.I. 51(51).
Type : 'M'.

Object : To study the residual effect of manuring on Maize.

1. BASAL CONDITIONS:
(i) (a) N.A.  (b) Berseem.  (c) N.A.
(ii) (a) and (b) Refer item II on page 143.
(iii) 8.7.1951.  (iv) (a) Tractor ploughing, tractor discing and ploughing with desi plough.  (b) Sowed with Kera.  (c) to (e) N.A.
(v) and (vi) N.A.  (vii) Irrigated.  (viii) Hoeing and weeding.  (ix) 6.82".  (x) 6.11.1951.

2. TREATMENTS:
Main-plot treatments:
7 doses of fertilizers : F<sub>1</sub> = Ammon. Phos. at 80 lb./ac. of P<sub>2</sub>O<sub>5</sub>, F<sub>2</sub> = Ammon. Phos. at 160 lb./ac. of P<sub>2</sub>O<sub>5</sub>, F<sub>3</sub> = Super at 80 lb./ac. of P<sub>2</sub>O<sub>5</sub> + A/S to supply N as in F<sub>1</sub>, F<sub>4</sub> = Super at 160 lb./ac. of P<sub>2</sub>O<sub>5</sub> + A/S to supply N as in F<sub>2</sub>, F<sub>5</sub> = Super at 80 lb./ac. of P<sub>2</sub>O<sub>5</sub>, F<sub>6</sub> = Super at 160 lb./ac. of P<sub>2</sub>O<sub>5</sub> and F<sub>7</sub> = No manure.

Sub-plot treatments:
3 levels of K<sub>2</sub>O as Pot. Sui.: K<sub>0</sub> = 0, K<sub>1</sub> = 40 and K<sub>2</sub> = 80 lb./ac.

Treatments applied to berseem in 1950—1951.

3. DESIGN:
(i) Split-plot.  (ii) (a) 7 main-plots/block and 3 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 43'x25'.  (b) 40'x22'.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Normal.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1946—N.A.  (b) and (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
(i) 296.4 lb./ac.
(ii) (a) 184.4 lb./ac.  (b) 79.5 lb./ac.
(iii) K effect alone is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>F&lt;sub&gt;1&lt;/sub&gt;</th>
<th>F&lt;sub&gt;2&lt;/sub&gt;</th>
<th>F&lt;sub&gt;3&lt;/sub&gt;</th>
<th>F&lt;sub&gt;4&lt;/sub&gt;</th>
<th>F&lt;sub&gt;5&lt;/sub&gt;</th>
<th>F&lt;sub&gt;6&lt;/sub&gt;</th>
<th>F&lt;sub&gt;7&lt;/sub&gt;</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>K&lt;sub&gt;0&lt;/sub&gt;</td>
<td>254.3</td>
<td>339.3</td>
<td>239.3</td>
<td>223.8</td>
<td>272.6</td>
<td>177.4</td>
<td>372.6</td>
<td>269.9</td>
</tr>
<tr>
<td>K&lt;sub&gt;1&lt;/sub&gt;</td>
<td>245.2</td>
<td>364.3</td>
<td>198.8</td>
<td>245.2</td>
<td>282.1</td>
<td>303.6</td>
<td>436.9</td>
<td>296.6</td>
</tr>
<tr>
<td>K&lt;sub&gt;2&lt;/sub&gt;</td>
<td>313.1</td>
<td>390.5</td>
<td>259.3</td>
<td>304.8</td>
<td>330.9</td>
<td>313.1</td>
<td>348.8</td>
<td>322.8</td>
</tr>
</tbody>
</table>

Mean | 274.2 | 364.7 | 232.1 | 257.9 | 295.2 | 264.7 | 386.1 | 291.4 |

S.E. of difference of two
1. main-plot treatment means = 75.7 lb./ac.
2. sub-plot treatment means = 21.1 lb./ac.
3. sub-plot treatment means at the same level of main-plot treatment mean = 56.2 lb./ac.
4. main-plot treatment means at the same level of sub-plot treatment mean = 88.2 lb./ac.
Object: To study the residual effect of manuring Berseem on the subsequent Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Berseem-Fallow-Wheat-Maize-Berseem and Berseem-Maize-Wheat-Maize-Berseem. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS:
   1. No manure.
   2. B.M. at 120 lb/ac. of P₂O₅.
   3. Ammo. Phos. at 120 lb/ac. of P₂O₅.
   4. Super at 120 lb/ac. of P₂O₅.
   5. B.M. at 60 lb/ac. of P₂O₅ + Ammo. Phos. at 60 lb/ac. of P₂O₅.
   6. B.M. at 60 lb/ac. of P₂O₅ + Super at 60 lb/ac. of P₂O₅.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (v) 165'x33', (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) No. (iii) Grain yield. (iv) (a) 1944-I.A.R. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 948 lb/ac.
   (ii) 78.4 lb/ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb/ac.
   Treatment | Av. yield
   --- | ---
   1. | 1021
   2. | 712
   3. | 896
   4. | 1101
   5. | 1021
   6. | 939
   S.E./mean = 45.3 lb/ac.
4. GENERAL:

(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1944—1948.  (b) Yes.  (c) N.A.  (v) (a) and (b) No.  (vi) N.A.  (vii) Nil.

5. RESULTS:

(i) 726 lb./ac.
(ii) 169.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>776</td>
</tr>
<tr>
<td>2.</td>
<td>621</td>
</tr>
<tr>
<td>3.</td>
<td>659</td>
</tr>
<tr>
<td>4.</td>
<td>803</td>
</tr>
<tr>
<td>5.</td>
<td>720</td>
</tr>
<tr>
<td>6.</td>
<td>776</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>≈97.6 lb./ac.</td>
</tr>
</tbody>
</table>

Crop := Maize (Kharif).  Ref := I.A.R.I. 48(9).  Type := 'M'.

Object := To study the residual effect of manuring Berseem on the subsequent Maize crop.

1. BASAL CONDITIONS:

(i) (a) Berseem-Fallow-Wheat-Maize-Berseem and Berseem-Wheat-Berseem-Maize.  (b) Berseem.
(c) As per treatments.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) N.A.  (iv) (a) to (e) N.A.  (v) to (x) N.A

2. TREATMENTS:

1. No manure.
2. B.M. at 120 lb./ac. of P₂O₅.
3. Ammo. Phos. at 120 lb./ac. of P₂O₅.
4. Super at 120 lb./ac. of P₂O₅.
5. B.M. at 60 lb./ac. of P₂O₅+Ammo. Phos. at 50 lb./ac. of P₂O₅.
6. B.M. at 60 lb./ac. of P₂O₅+Super at 60 lb./ac. of P₂O₅.

3. DESIGN:

(i) R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 3.  (iv) (a) N.A.  (b) 165'x33'.  (v) N.A.  (vi) Yes.

4. GENERAL:

(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1944—1948.  (b) Yes.  (c) N.A.  (v) (a) and (b) No.  (vi) N.A.  (vii) Nil.

5. RESULTS:

(i) 1736 lb./ac.
(ii) 254.4 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1754</td>
</tr>
<tr>
<td>2.</td>
<td>1688</td>
</tr>
<tr>
<td>3.</td>
<td>1749</td>
</tr>
<tr>
<td>4.</td>
<td>1664</td>
</tr>
<tr>
<td>5.</td>
<td>1784</td>
</tr>
<tr>
<td>6.</td>
<td>1778</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>≈146.9 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Maize (Kharif). Ref: I.A.R.I. 48(11). Type: 'M'.

Object: To study the residual effect of manuring Berseem on the subsequent Maize crop.

1. BASAL CONDITIONS:
   (i) (a) Berseem—Fallow—Wheat—Maize—Berseem and Berseem—Maize—Wheat—Berseem—Maize—Berseem. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS:
   1. No manure.
   2. B.M. at 120 lb./ac. of P₂O₅.
   3. Ammo. Phos. at 120 lb./ac. of P₂O₅.
   4. Super at 120 lb./ac. of P₂O₅.
   5. B.M. at 60 lb./ac. of P₂O₅ + Ammo. Phos. at 60 lb./ac. of P₂O₅.
   6. B.M. at 60 lb./ac. of P₂O₅ + Super at 60 lb./ac. of P₂O₅.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (v) 165° x 33'. (vi) No. (vii) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1948. (b) Yes. (c) N.A. (v) (vi) (vii) and (viii) Nil.

5. RESULTS:
   (i) 1.46 ton/ac.
   (ii) 0.16 ton/ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.47</td>
</tr>
<tr>
<td>2.</td>
<td>1.40</td>
</tr>
<tr>
<td>3.</td>
<td>1.59</td>
</tr>
<tr>
<td>4.</td>
<td>1.50</td>
</tr>
<tr>
<td>5.</td>
<td>1.52</td>
</tr>
<tr>
<td>6.</td>
<td>1.42</td>
</tr>
</tbody>
</table>

S.E./mean = 0.09 ton/ac.

---

Crop: Maize (Kharif). Ref: I.A.R.I. 48(11). Type: 'M'.

Object: To find out the residual effect of the phosphate manuring of Berseem on the subsequent Maize crop.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.7.1948. (iv) (a) Tractor ploughing and discing. (b) to (c) N.A. (v) N.A. (vi) and (vii) N.A. (viii) 2 sowings. (ix) 19°. (x) 27.10.1948.

2. TREATMENTS:
   1. No manure.
   2. B.M. at 120 lb./ac. of P₂O₅.
   3. Ammo. Phos. at 120 lb./ac. of P₂O₅.
   4. Super at 120 lb./ac. of P₂O₅.
   5. B.M. at 60 lb./ac. of P₂O₅ + Ammo. Phos. at 60 lb./ac. of P₂O₅.
   6. B.M. at 60 lb./ac. of P₂O₅ + Super at 60 lb./ac. of P₂O₅.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (v) 165° x 33'. (vi) N.A. (vii) No.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1948. (b) No. (c) N.A. (v) (a) and (b) Yes. (vi) and (vii) Nil.
5. RESULTS:

(i) 948 lb./ac.
(ii) 247.2 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1021</td>
</tr>
<tr>
<td>2.</td>
<td>712</td>
</tr>
<tr>
<td>3.</td>
<td>896</td>
</tr>
<tr>
<td>4.</td>
<td>1101</td>
</tr>
<tr>
<td>5.</td>
<td>1021</td>
</tr>
<tr>
<td>6.</td>
<td>939</td>
</tr>
</tbody>
</table>

S.E./mean = 142.7 lb./ac.

Crop: Maize (Kharif).
Ref: I.A.R.I. 48(15).
Type: 'M'.

Object: To study the residual effect of phosphatic manuring of Berseem on subsequent Maize crop.

1. BASAL CONDITIONS:

(i) (a) No. (b) Berseem and sunnhemp. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.7.1948. (iv) (a) Tractor discing and grubbing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 2 horse hoeing. (ix) 21.5.3'. (x) 22 to 25.10.1948.

2. TREATMENTS:

1. No manure.
2. B.M. at 120 lb./ac. of P₂O₅.
3. Amo. Phos. at 120 lb./ac. of P₂O₅.
4. Super at 120 lb./ac. of P₂O₅.
5. B.M. at 60 lb./ac. of P₂O₅ + Amo. Phos. at 60 lb./ac. of P₂O₅.
6. B.M. at 60 lb./ac. of P₂O₅ + Super at 60 lb./ac. of P₂O₅.

Manures applied to previous crop.

3. DESIGN:


4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1944—1948. (b) N.A. (c) N.A. (d) N.A. (e) No. (f) N.A. (g) N.A. (h) Nil. (i) Nil.

5. RESULTS:

(i) 1755 lb./ac.
(ii) 444.3 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1754</td>
</tr>
<tr>
<td>2.</td>
<td>1928</td>
</tr>
<tr>
<td>3.</td>
<td>1749</td>
</tr>
<tr>
<td>4.</td>
<td>1664</td>
</tr>
<tr>
<td>5.</td>
<td>1665</td>
</tr>
<tr>
<td>6.</td>
<td>1772</td>
</tr>
</tbody>
</table>

S.E./mean = 286.5 lb./ac.
Crop : Maize (Kharif). Ref : I.A.R.I. 48(16). Type : 'M'.

Object :—To study the residual effect of phosphatic manuring of Berseem with F.Y.M. as a basal dose on Maize crop.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 20.7.1948. (iv) (a) Tractor ploughing and discing. (b) to (c) N.A. (v) F.Y.M. at 10 ton/ac. (vi) N.A. (vii) N.A. (viii) 2 horse hoeings. (ix) 16.30'. (x) 7 to 9.10.1948.

2. TREATMENTS:
   1. No manure.
   2. B.M. at 120 lb/ac. of \( \text{P}_2\text{O}_5 \).
   3. Ammono. Phos. at 120 lb/ac. of \( \text{P}_2\text{O}_5 \).
   4. Super at 120 lb/ac. of \( \text{P}_2\text{O}_5 \).
   5. B.M. at 60 lb/ac. of \( \text{P}_2\text{O}_5 \)+ Ammono. Phos. at 60 lb/ac. of \( \text{P}_2\text{O}_5 \).
   6. B.M. at 60 lb/ac. of \( \text{P}_2\text{O}_5 \)+ Super at 60 lb/ac. of \( \text{P}_2\text{O}_5 \).

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (v) 33' x 165'. (vi) N.A. (vii) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Fodder yield. (iv) (a) 1944—1945. (b) Yes. (c) N.A. (v) (a) Nil. (b) Nil. (vii) Nil.

5. RESULTS:
   (i) 1.78 ton/ac.
   (ii) 0.19 ton/ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>1.79</td>
</tr>
<tr>
<td>2</td>
<td>1.70</td>
</tr>
<tr>
<td>3</td>
<td>1.82</td>
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<td>1.81</td>
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<td>5</td>
<td>1.85</td>
</tr>
<tr>
<td>6</td>
<td>1.73</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=0.11 ton/ac.</td>
</tr>
</tbody>
</table>

Crop : Maize (Kharif). Ref : I.A.R.I. 48(17). Type : 'M'.

Object :—To study the residual effect of phosphatic manuring of Berseem without any basal manure on Maize crop.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.7.1948. (iv) (a) Tractor ploughing and discing. (b) to (c) N.A. (v) Nil. (vi) and (vii) N.A. (viii) 2 hoeings. (ix) 14.15'. (x) 27.10.1948.

2. TREATMENTS:
   1. No manure.
   2. B.M. at 120 lb/ac. of \( \text{P}_2\text{O}_5 \).
   3. Ammono. Phos. at 120 lb/ac. of \( \text{P}_2\text{O}_5 \).
   4. Super at 120 lb/ac. of \( \text{P}_2\text{O}_5 \).
   5. B.M. at 60 lb/ac. of \( \text{P}_2\text{O}_5 \)+ Ammono. Phos. at 60 lb/ac. of \( \text{P}_2\text{O}_5 \).
   6. B.M. at 60 lb/ac. of \( \text{P}_2\text{O}_5 \)+ Super at 60 lb/ac. of \( \text{P}_2\text{O}_5 \).

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 33' x 165'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1944—1946. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:
   (i) 948 lb./ac.
   (ii) 1073 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1021</td>
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<tr>
<td>2.</td>
<td>712</td>
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<td>3.</td>
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<td>4.</td>
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<td>5.</td>
<td>1021</td>
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<tr>
<td>6.</td>
<td>938</td>
</tr>
</tbody>
</table>
   S.E./mean = 619.5 lb./ac.

Crop: Maize (Kharif). Ref: I.A.R.I. 53(14). Type: 'M'.

Object: To study the effect of inorganic and organic manures on the yield of cereals.

1. BASAL CONDITIONS:
   (i) (a) Maize-Wheat. (b) Wheat. (c) As per treatments.
   (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 27.6.1952.
   (iv) (a) 4 ploughings with desi plough. (b) to (e) N.A.
   (v) N.A. (vi) N.A. (vii) Irrigated.
   (viii) 3 weedings. (ix) N.A. (x) 28 to 30.9.1952.

2. TREATMENTS:
   1. Control.
   2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5.
   3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5+Pot. Sul. at 100 lb./ac. of K_2O.
   4. F.Y.M. at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5+Pot. Sul. at 100 lb./ac. of K_2O.
   5. Castor cake at 60 lb./ac. of N+Super at 100 lb./ac. of P_2O_5+Pot. Sul. at 100 lb./ac. of K_2O.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38'x29'. (b) 36'x27'. (v) 1' on each side. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1199 lb./ac.
   (ii) 181.85 lb./ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>951</td>
</tr>
<tr>
<td>2.</td>
<td>1221</td>
</tr>
<tr>
<td>3.</td>
<td>1215</td>
</tr>
<tr>
<td>4.</td>
<td>1150</td>
</tr>
<tr>
<td>5.</td>
<td>1459</td>
</tr>
</tbody>
</table>
   S.E./mean = 74.2 lb./ac.

Crop: Maize (Kharif). Ref: I.A.R.I. 52(11). Type: 'M'.

Object: To study the effect of inorganic manures on the yield of cereals.

1. BASAL CONDITIONS:
   (i) (a) Maize-Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 19.7.1952. (iv) (a) 1 ploughing with victory plough and 2 with desi plough. (b) to (e) N.A.
   (vi) N.A. (vii) Irrigated. (viii) 2 weedings and 2 hoeings with horse hoe. (ix) N.A. (x) 24 to 26.10.1952
2. TREATMENTS:

1. Control.
2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅.
3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.
4. F.Y.M. at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.
5. Castor cake at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38' x 27'. (b) 36' x 27'. (v) 1' around. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952-N.A. (b) Yes. (c) N.A. (v) No and (vi) Nil.

5. RESULTS:

(i) 1142 lb./ac.
(ii) 273.2 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tr>
<tr>
<td>2</td>
<td>1236</td>
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<tr>
<td>3</td>
<td>969</td>
</tr>
<tr>
<td>4</td>
<td>1258</td>
</tr>
<tr>
<td>5</td>
<td>1323</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=111.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Maize (Kharif).  Ref :- I.A.R.L. 52(13).  Type :- 'M'.

Object :- To study the effect of inorganic and organic manures on the yield of crops in rotation.

1. BASAL CONDITIONS:

(i) (a) Maize-Wheat-Maize-Pass. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.6.1953. (iv) (a) 4 ploughings with desi plough. (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 28.9.1953 to 20.10.1953.

2. TREATMENTS:

1. Control.
2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅.
3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+Pot. Sul. at 100 lb./ac. of K₂O.
4. F.Y.M. at 60 lb./ac. of N+Super and Pot. Sul. to make up P₂O₅ and K₂O as in treatment 3.
5. Castor cake at 60 lb./ac. of N+Super and Pot. Sul. to make up P₂O₅ and K₂O as in treatment 3.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 38' x 27'. (b) 35' x 27'. (v) 1' around. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952-N.A. (b) Yes (except in 1956). (c) N.A. (v) No and (vi) Nil.

5. RESULTS:

(i) 1061 lb./ac.
(ii) 385.1 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1150</td>
</tr>
<tr>
<td>2</td>
<td>1157</td>
</tr>
<tr>
<td>3</td>
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<td>4</td>
<td>1064</td>
</tr>
<tr>
<td>5</td>
<td>924</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=157.2 lb./ac.</td>
</tr>
</tbody>
</table>
Object: To study the effect of direct and indirect manuring of cereals in rotation with *Robi* legume.

**1. BASAL CONDITIONS:**

(i) (a) and (b) *Robi* legumes. (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) N.A.  (iv) (a) to (e) N.A.  (v) N.A.  (vi) N.A.  (vii) N.A.  (viii) N.A.  (ix) N.A.  (x) N.A.

**2. TREATMENTS:**

1. No manure to legume; 40 lb./ac. of N to cereal.
2. A/S at 40 lb./ac. of N+Super at 120 lb./ac. of P<sub>2</sub>O<sub>5</sub> of N to legume.
3. Super at 120 lb./ac. of P<sub>2</sub>O<sub>5</sub> +80 lb./ac. of K<sub>2</sub>O to legume.
4. Super at 120 lb./ac. of P<sub>2</sub>O<sub>5</sub>+Potash [dose N.A.].
5. 80 lb./ac. of K<sub>2</sub>O to legume but no manure to cereal.
6. Manure to cereal.

**3. DESIGN:**

(i) R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 84'×26'.  (v) N.A.  (vi) Yes.

**4. GENERAL:**

(i) N.A.  (ii) N.A.  (iii) Yield of fodder.  (iv) (a) to (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) Nil.

**5. RESULTS:**

(i) 1.65 ton/ac.
(ii) 0.60 ton/ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of fodder in ton/ac. Treatment Av. yield
1. 2.03
2. 1.44
3. 1.67
4. 1.55
5. 1.51
6. 1.69
S.E./mean =0.245 ton/ac.

Crop: Maize (*Kharif*).

**Object:** To study the effect of different combinations of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O on Maize crop.

**1. BASAL CONDITIONS:**

(i) (a) to (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 25.6.1953.  (iv) (a) Floughing with empire plough, 1 with desi plough and 2 harrowings.  (b) to (e) N.A.  (v) N.A.  (vi) Unirrigated.  (vii) 1 lever harrowing, 1 hoeing with desi plough and ridging. (a) 40.44'.  (x) 5. 6.10.1953.

**2. TREATMENTS:**

1. No manure.  6. Super at 40 lb./ac of P<sub>2</sub>O<sub>5</sub>.  7. Treat. 5+6.
2. F.Y.M. at 8000 lb./ac.  8. Treat. 4+5+6.
3. Rape cake at 40 lb./ac. of N.  9. Treat. 4+6.
4. A/S at 20 lb./ac. of N.  10. Treat. 4+5.
5. Pot. Sul. at 25 lb./ac. of K<sub>2</sub>O.  

**3. DESIGN:**

(i) R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 10.  (iv) (a) 44'×24'.  (b) 37.5'×18'.  (v) N.A.  (vi) Yes.

**4. GENERAL:**

(i) N.A.  (ii) Top and stem bores and some cases of mosaic.  (iii) N.A.  (iv) (a) 1932–1956.  (b) and (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) Nil.

**5. RESULTS:**

(i) 365.2 lb./ac.
(ii) 118.6 lb./ac.
(iii) Treatment differences are highly significant.
Crop := Maize (Kharif).  
Ref := I.A.R.I. 51(29).  
Type := 'M'.

Object := To study the effect of manured, unmanured, one, two and three year ley farming on soil fertility as judged by the yields of Maize and Wheat crops.

1. BASAL CONDITIONS:

(i) (a) Wheat—Maize. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5, 6, 7, 1951. (iv) (a) Ploughing with victory plough, desi plough and preparatory tillage before sowing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with horse hoe and weeding. (ix) N.A. (x) 11, 12 and 16.10.1951.

2. TREATMENTS:

Main-plot treatments:
9 treatments (ley farming): T1 = one year ley—full dose, T2 = one year ley—no manure, T3 = two year ley—full dose, T4 = two year ley—manure applied once, T5 = two year ley—no manure, T6 = three year ley—full dose every year, T7 = three year ley—full dose for two consecutive years, T8 = three year ley—full dose once, T9 = three year ley—no manure.

Sub-plot treatments:

3. DESIGN:

(i) Split-plot. (ii) (a) 9 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 acre. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) Yes; 1949—1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Raw data N.A. Information given as available. Clarification is N.A. Description of (1) to (5) in the results for main-plots N.A.

5. RESULTS:

(i) 813 lb./ac.
(ii) (a) N.A.
(b) 130.0 lb./ac.
(iii) Sub-plot treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
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<td>M1</td>
<td>955</td>
<td>852</td>
<td>917</td>
<td>829</td>
<td>792</td>
<td>869</td>
</tr>
<tr>
<td>M2</td>
<td>860</td>
<td>757</td>
<td>978</td>
<td>844</td>
<td>908</td>
<td>869</td>
</tr>
<tr>
<td>M3</td>
<td>810</td>
<td>792</td>
<td>855</td>
<td>815</td>
<td>817</td>
<td>818</td>
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<tr>
<td>M4</td>
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<td>679</td>
<td>702</td>
<td>714</td>
<td>699</td>
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<td>Mean</td>
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<td>770</td>
<td>863</td>
<td>801</td>
<td>804</td>
<td>813</td>
</tr>
</tbody>
</table>

S.E. per treatment mean for sub-plot treatments = 22.98 lb./ac.
Crop: Maize (Kharif).  
Object: To study the effect of manured, unmanured, one, two and three year ley farming on soil fertility as judged by the yields of Maize and Wheat crops.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) Wheat. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 19.7.1952. (iv) (a) Ploughing with victory plough and discing with tractor twice. (b) to (e) N.A. (v) Nil. (vi) Maize yellow No. 2. (vii) Irrigated. (viii) Hoeing with horse hoe, destil hoe, thinning and weeding. (ix) N.A. (x) 23.10.1952.

2. TREATMENTS:
   Main-plot treatments:
   9 treatments (ley farming): T₁=one year ley—full dose, T₂=one year ley—no manure, T₃=two year ley—full dose, T₄=two year ley—manure applied once, T₅=two year ley—no manure, T₆=three year ley—full dose every year, T₇=three year ley—full dose once and T₈=three year ley—no manure.

Sub-plot treatments:

3. DESIGN:
   (i) (a) Split-plot. (ii) (a) 9 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 acre. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Last two replications showed poor growth as crop could not be sown with irrigation. (ii) N.A. (iii) Grain yield. (iv) (a) Yes; 1949—1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS:
   (i) 379 lb./ac.  
   (ii) (a) 255.4 lb./ac.  
   (b) 104.2 lb./ac.  
   (iii) Main-plot treatments and sub-plot treatments do not differ significantly. Interaction is significant.  
   (iv) Av. yield of grain 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>T₈</th>
<th>T₉</th>
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<tr>
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<td>370</td>
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<td>382</td>
<td>385</td>
<td>311</td>
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</tr>
</tbody>
</table>

S.E. of the difference of two
1. main-plot treatment means = 63.8 lb./ac.
2. sub-plot treatment means = 17.4 lb./ac.
3. sub-plot treatment means at the same level of main-plot treatment mean = 73.7 lb./ac.
4. main—plot treatment means at the same level of sub-plot treatment mean = 110.6 lb./ac.

Crop: Maize (Kharif).  
Object: To study the effect of manured, unmanured, one, two and three years ley farming on soil fertility as judged by the yields of Maize and Wheat crops.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18 to 20.6.1953. (iv) (a) 1 ploughing with victory and destil plough and preparing land for sowing. (b) to (e) N.A. (v) Nil. (vi) Maize yellow No. 2. (vii) Irrigated. (viii) Lever harrowing, hoeing with horse hoe, thinning and weeding. (ix) N.A. (x) 28.9.1953 to 5.10.1953.
2. TREATMENTS:

Main-plot treatments:

9 treatments (lye farming): T1 = one year lye—full dose, T2 = one year lye—no manure, T3 = two year lye—full dose, T4 = two year lye—manure applied once, T5 = two year lye—no manure, T6 = three year lye—full dose every year, T7 = three year lye—full dose once and T8 = three year lye—no manure.

Sub-plot treatments:


3. DESIGN:

(i) Split-plot. (ii) 9 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) No. (vi) Yes.

4. GENERAL:

(i) Subnormal growth. (ii) Monkeys damaged the crop. (iii) Grain yield. (iv) (a) Yes; 1949—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 632 lb./ac.
(ii) (a) 311.91 lb./ac. (b) 205.7 lb./ac.
(iii) Main-plot treatments differ significantly, sub-plot treatments differ highly significantly while interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></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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<td>510</td>
<td>980</td>
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<td>1089</td>
</tr>
<tr>
<td>M2</td>
<td>610</td>
<td>620</td>
<td>530</td>
<td>370</td>
<td>490</td>
<td>719</td>
<td>620</td>
<td>590</td>
<td>759</td>
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<td>500</td>
<td>540</td>
<td>780</td>
<td>850</td>
<td>600</td>
<td>1010</td>
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<td>M4</td>
<td>759</td>
<td>400</td>
<td>513</td>
<td>390</td>
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<td>490</td>
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<td>512</td>
<td>757</td>
<td>698</td>
<td>600</td>
<td>844</td>
</tr>
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</table>

S.E. of difference of two
1. main-plot treatment means = 110.3 lb./ac.
2. sub-plot treatment means = 48.6 lb./ac.
3. sub-plot treatment means at the same level of main-plot treatment mean = 145.6 lb./ac.
4. main-plot treatment means at the same level of sub-plot treatment mean = 172.8 lb./ac.

Crop: Maize (Kharif).

Object: To study the best cultural treatment in combination with best method of application of fertilizers to Maize.

1. BASAL CONDITIONS:

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 20.7.1950. (iv) (a) As per treatments. (b) Sown in lines with Oudh plough and kera. (c) N.A. (d) 2' apart. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) As per treatments. (ix) 5'. (x) N.A.

2. TREATMENTS:

Main-plot treatments:

Number of ploughings: C1 = two, C2 = four and C3 = six ploughings.

Sub-plot treatments:

5 cultural operations: H1 = one interculture, H2 = two intercultures, H3 = three intercultures, H4 = four intercultures and H5 = removal of weeds.
3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replications; 5 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A., (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 865.5 lb./ac. (ii) (a) 454.2 lb./ac. (b) 109.8 lb./ac. (c) 285.0 lb./ac. (iii) Main effect of H and interaction C x H are highly significant. All others are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>H1</th>
<th>H2</th>
<th>H3</th>
<th>H4</th>
<th>H5</th>
<th>Mean</th>
<th>M1</th>
<th>M5</th>
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<tbody>
<tr>
<td>C1</td>
<td>738.7</td>
<td>810.0</td>
<td>768.7</td>
<td>1053.7</td>
<td>693.7</td>
<td>813.0</td>
<td>843.0</td>
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<tr>
<td>C2</td>
<td>933.7</td>
<td>948.7</td>
<td>877.5</td>
<td>821.2</td>
<td>825.0</td>
<td>881.2</td>
<td>867.0</td>
</tr>
<tr>
<td>C3</td>
<td>877.5</td>
<td>997.5</td>
<td>956.3</td>
<td>840.1</td>
<td>840.0</td>
<td>902.3</td>
<td>855.0</td>
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<td>905.0</td>
<td>786.2</td>
<td>865.5</td>
<td>855.0</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. C marginal means = 101.6 lb./ac.
2. H marginal means = 31.69 lb./ac.
3. M marginal means = 52.03 lb./ac.
4. H means at the same level of C = 54.89 lb./ac.
5. C means at the same level of H = 112.80 lb./ac.

Object:—To study the best cultural treatment in combination with best method of application of fertilizer to Maize.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 31.7.1951. (v) (a) OAuth ploughing. (b) and (c) N.A. (d) 2f apart. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeings and as per treatments. (ix) N.A. (x) 1, 8.11.1951.

2. TREATMENTS:
Main-plot treatments:
Number of ploughings: C1 = two, C2 = four and C3 = six ploughings.

Sub-plot treatments:
4 cultural operations: H1 = one interculture, H2 = two intercultures, H3 = three intercultures and H4 = removal of weeds.

Sub-sub-plot treatments:
3 methods of application of manures: M1 = in plough sole, M2 = on top of furrow and M3 = broadcast. Interculture done with bullock hoe. 5,000 lb. of manures mixture, in 1 : 2 : 1 ratio, of N, P, K applied as M1, M2 and M3.
3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication, 4 sub-plots/main-plot, 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) N.A. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

5. RESULTS:
(i) 1500 lb./ac.
(ii) (a) 339.0 lb./ac. (b) 209.8 lb./ac.
(iii) C<br><br>RESULTS:
(i) 1500 lb./ac.
(ii) (a) 339.0 lb./ac. (b) 209.8 lb./ac. (c) 351.4 lb./ac.
(iii) Main effect of H is highly significant and main effect of M is significant. Interaction C x H is highly significant while the rest are all not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>C1</th>
<th>H1</th>
<th>H2</th>
<th>H3</th>
<th>H4</th>
<th>Mean</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
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<td></td>
<td>1500</td>
<td>1711</td>
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</table>

S.E. of difference of two
1. C marginal means = 69.2 lb./ac.
2. H marginal means = 49.3 lb./ac.
3. M marginal means = 71.7 lb./ac.
4. H means at the same level of C = 85.7 lb./ac.
5. C means at the same level of H = 101.4 lb./ac.

Crop: Maize (Kharif).

Ref: I.A.R.I. 52(32). Type: 'C'.

Object: To study the best cultural treatment in combination with best method of application of fertilizer to Maize.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28, 30.7.1953. (iv) (a) As per treatments. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 3, 8.10.1953.

2. TREATMENTS:
Main-plot treatments:
Number of ploughings: C1 = two, C2 = four and C3 = six ploughings.

Sub-plot treatments:
4 cultural operations: H1 = one interculture, H2 = two intercultures, H3 = three intercultures and H4 = removal of weeds.

Sub-sub-plot treatments:
3 methods of application of manures: M1 = in plough sole, M2 = on top of furrow and M3 = broadcast. Interculture done with bullock hoe. 5000 lb. of manures mixture, in 1 : 2 : 1 ratio, of N, P, K applied as M1, M2 and M3.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot; 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/72 ac. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data is N.A.

5. RESULTS:
(i) 1178 lb./ac.
(ii) (a) 353.7 lb./ac.
(b) 205.6 lb./ac.
(c) 193.6 lb./ac.
(iii) Main effects of C, H and M are not significant.
(iv) Av. yield of grain in lb./acre.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<td>H&lt;sub&gt;1&lt;/sub&gt;</td>
<td>1133</td>
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<tr>
<td>C&lt;sub&gt;2&lt;/sub&gt;</td>
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<td>H&lt;sub&gt;2&lt;/sub&gt;</td>
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<td>C&lt;sub&gt;3&lt;/sub&gt;</td>
<td>1144</td>
<td>H&lt;sub&gt;3&lt;/sub&gt;</td>
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<td>S.E./mean</td>
<td>62.52 lb./ac.</td>
<td>S.E./mean</td>
</tr>
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Crop: Maize. Ref: I.A.R.I. 52(22). Type: 'C'.

Object: To study the effect of sowing premature and mature seed of Kharif crops on their yield.

1. BASAL CONDITIONS:
(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 29 and 30.7.1952. (iv) (a) Tractor ploughing, tractor discing and desi ploughing cross-wise in 3rd week of July 1953. (b) to (e) N.A. (v) N.A. (vi) Maize yellow No. 2, Maize T-41, Bajra Local, Jowar white Purhi, Jowar local and cow-peas 397. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Oct. and Nov. 1952.

2. TREATMENTS:
1. Sowing fully mature seeds.
2. Sowing 1 week premature seeds.
3. Sowing 2 week premature seeds.

3. DESIGN:
(i) R.B.D. (ii) (a) 3 for each crop. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 30'x27'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Poor in cowpeas and jowar. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1952—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A. Experiment conducted with 3 treatments on 6 crops as given under item (vi) in basal conditions. Results for other crops given under respective crops.

5. RESULTS:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Av. yield</th>
</tr>
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<tbody>
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<tr>
<td>Maize yellow No. 2</td>
<td>4618</td>
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<tr>
<td>Maize T-41</td>
<td>4123</td>
</tr>
<tr>
<td>Maize yellow No. 2</td>
<td>4043</td>
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<tr>
<td>Maize T-41</td>
<td>3915</td>
</tr>
<tr>
<td></td>
<td>S.E./mean =201.2 lb./ac.</td>
</tr>
<tr>
<td></td>
<td>S.E./mean =137.2 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Maize. Ref: I.A.R.I. 53(31) Type: 'C'.

Object: To study the effect of sowing premature and mature seed on their yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Maize and bajra on 25.7.1953 and jowar and cowpeas on 28.7.1953. (iv) (a) 1 Tractor ploughing, 4 deep ploughings and sub. (b) to (c) N.A.

2. TREATMENTS:
   1. Sowing fully mature seeds.
   2. Sowing 1 week pre-mature seeds.
   3. Sowing 2 weeks pre-mature seeds.

3. DESIGN:

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Yield of grain. (iv) (a) 1952 to 1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A. Experiments conducted with 3 treatments on 5 crops as given under item (vi) in basal conditions. Results for other crops are given under respective crops.

5. RESULTS:
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Maize yellow No. 2 Av. yield</th>
<th>Maize T-41 Av. yield</th>
</tr>
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<td>2172</td>
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</tr>
<tr>
<td>3.</td>
<td>1530</td>
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</tr>
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</table>

S.E./mean N.A.

---

Crop: Maize (Kharif). Ref: I.A.R.I. 51 (19) Type: 'CM'.

Object: To study the effect of basal dose, fertilizer placement and spacing with different levels of N and P to maize and to study the residual effect on the following crop.

1. BASAL CONDITIONS:
   (i) (a) Maize-oats (b) N.A. (c) N.A. (ii) (a) & (b) Refer item 11 on page 143. (iii) 11,12,7.51. (iv) (a) Double discing. (b) to (e) N.A. (v) N.A. (vi) Irrigated. (vii) Hoeing, earthing, thinning and weeding. (ix) 2.7'. (x) 21 to 24.10.1951.

2. TREATMENTS:
   Main plot treatments:
   - 2 levels of F.Y.M. as basal dressing: B0 = 0 and B1 = 20 lb./ac. of N as F.Y.M.
   - All combinations of (1) and (2)
     (1) 2 methods of fertilizer application: M1 = Broadcasting and M2 = placement.
     (2) 3 spacings between rows: S1 = 2', S2 = 21' and S3 = 3'.

Sub-sub-plot treatments:
   - All combinations of (1) and (2)
     (1) 3 levels of N as A/S: N1 = 20, N2 = 40 and N3 = 60 lb./ac. of N.
     (2) 2 levels of P2O5 as Super with 20 lb./ac. of K2O as Pot. Suit.: P1 = 40 and P2 = 80 lb./ac. of P2O5.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block, 6 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A.
   (iii) 2. (iv) (a) 48'x24'. (b) S1 = 44'x20'; S2 = 42.5'x20' and S3 = 42'x20'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Phadka bores. (iii) Grain yield. (iv) (a) 1949—1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) & (vii) Nil.
5. RESULTS:

(i) 1315 lb./ac.
(ii) (a) 1151 lb./ac.
(b) 616 lb./ac.
(c) 286 lb./ac.

(iii) N and P effects are highly significant. All other effects are not significant.

(iv) Av. yield of maize in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁M₁</th>
<th>S₂M₂</th>
<th>S₃M₃</th>
<th>S₄M₄</th>
<th>S₅M₅</th>
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E. of difference of two:
1. Main plot treatment means = 192.2 lb./ac.
2. Sub-plot treatment means = 177.8 lb./ac.
3. Sub-sub plot treatment means = 82.5 lb./ac.
4. Sub-plot treatment means at the same level of main-plot treatment = 251.5 lb./ac.
5. Main-plot treatment means at the same level of sub-plot treatment = 299.5 lb./ac.
6. Sub-sub plot treatment means at the same level of main-plot treatment = 116.7 lb./ac.
7. Main-plot treatment means at the same level of sub-sub plot treatment = 220.0 lb./ac.
8. Sub-sub plot treatment means at the same level of sub-plot treatment = 202.2 lb./ac.
9. Sub-plot treatment means at the same level of sub-sub-plot treatment = 256.3 lb./ac.

Crop: Maize (Kharif). Ref: I.A.R.I. 50(19). Type: CM.

Object: To study the depth of cultivation with and without inversion on the yield of Maize.

1. BASAL CONDITIONS:

(i) (a) No. (b) N.A. (c) N.A. (d) and (b) Refer item 11 on page 143. (ii) 13.7.1950. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Nil. (viii) 2 hoeings with horse hoe. (ix) N.A. (e) 26 to 28.10.1950.

2. TREATMENTS:

Main-plot treatments:
4 methods of ploughing: C₁=9" deep tractor ploughing in 1st instance followed by normal cultivation with tractor implement (disc). C₂=Ploughing 5" deep with soil inverting plough by bullock in 1st instance followed by normal cultivation with country plough and C₃=Ploughing with country plough. C₄=Tractor discing.

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-plot. (ii) (a) 4 main-plots/replication and 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 - N.A. (b) N.A. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) 1163 lb./ac.
(ii) (a) 674.7 lb./ac.
(b) 370.3 lb./ac.
(iii) Main effect of N alone is highly significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. C marginal means
2. N marginal means
3. C means at the same level of N
4. N means at the same level of C

Crop: Maize (Kharij).
Ref: I.A.R.I. 51(17).
Type: 'CM'.

Object: To study the effect of depth of cultivation with and without inversion on the yield of Maize.

1. BASAL CONDITIONS:

(i) (a) No. (b) N.A. (c) N.A. (iii) (a) Heavy soil. (b) Refer item 11 on page 143. (iii) 6.8.1951.
(iv) (a) As per treatments. (b) Seed sown with desi plough. (c) N.A. (d) 2' apart in rows. (e) N.A.

2. TREATMENTS:

Main-plot treatments:
4 methods of ploughing: C₁ = Tractor ploughing 9' to 10' deep followed by tractor discing. C₂ = 5' to 6'
depth bullock soil inverting plough followed by country plough. C₃ = ploughing with country plough and C₄ = Tractor discing.

Sub-plot treatments:
4 levels of N as F.Y.M.: N₀ = 0, N₁ = 40, N₂ = 83 and N₃ = 120 lb./ac.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a), (b) 1/40 acre.
(v) Nil (vi) N.A.

4. GENERAL:

(i) Germination satisfactory. Growth of the crop in general poor due to late sowing. (ii) N.A. (iii) Grain yield. (iv) (a) 1950-1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Maize crop failed in 1950 due to heavy rain and water logging. (vii) Nil.

5. RESULTS:

(i) 747 lb./ac.
(ii) (a) 222.4 lb./ac.
(b) 146.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

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Mean 695 696 800 798 747

S.E. of difference of two
1. C marginal means = 90.8 lb./ac.
2. N marginal means = 59.6 lb./ac.
3. N means at the same level of C = 159.2 lb./ac.
4. C means at the same level of N = 123.9 lb./ac.

Crop: Maize (Kharif)  Ref: I.A.R.I. 52(19) Type: ‘CM’.

Object: To study the effect of depth of cultivation with and without inversion on the yield of Maize.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.7.1952. (iv) (a) As per treatments. (b) Sown with monarch drill. (c) N.A. (d) 2’ apart in rows. (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 weeding and 2 hoeings. (ix) N.A. (x) 5.11.1952.

2. TREATMENTS:
   Main-plot treatments:
   - 4 types of ploughing: C₁=Tractor ploughing 9”-10’ deep followed by tractor discing, C₂=Bullock soil inversion plough (victory) 5’ to 6’ deep followed by country plough, C₃=Ploughing with country plough and C₄=Tractor discing.
   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. spread on 3, 4.7.1952.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 40’x26.5’. (b) N.A. (v) N.A. (vi) N.A.

4. GENERAL:
   (i) Germination satisfactory. (ii) N.A. (iii) Yield of grain. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1002 lb./ac.
   (ii) (a) 371.9 lb./ac.
   (b) 342.3 lb./ac.
   (iii) Main-plot treatments differ significantly. Sub-plot treatments differ highly significantly. Interaction is not significant.
   (iv) Av. yield of grain in lb./ac.

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<tr>
<th></th>
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Mean 1152 1055 1062 738 1002
Object: To study the effect of depth of cultivation with and without inversion on the yield of Maize.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   4 types of ploughing: $C_1$ = Tractor ploughing 9'-10' deep followed by tractor discing, $C_2$ = Bullock soil inversion plough (victory) 5' to 6' deep followed by country plough, $C_3$ = Ploughing with country plough and $C_4$ = Tractor discing.
   Sub-plot treatments:
   4 levels of N as F.Y.M.: $N_0$ = 0, $N_1$ = 40, $N_2$ = 80 and $N_3$ = 120 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes. (vii) Nil.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Yield of grain. (iv) (a) 1950-1954. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 826.3 lb./ac.
   (ii) (a) 55.13 lb./ac.
   (b) 27.97 lb./ac.
   (iii) Main-plot treatments and interaction are significant. Sub-plot treatments are highly significant.
   (iv) Av. yield of grain in lb./ac.

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<tr>
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Mean 665 795 862 982 826

S.E. of difference of two
1. Main-plot treatment means = 19.49 lb./ac.
2. Sub-plot treatment means = 9.89 lb./ac.
3. Sub-plot treatment means at the same level of main-plot treatment = 19.78 lb./ac.
4. Main-plot treatment means at the same level of sub-plot treatment = 39.20 lb./ac.


Object: To study the response of Hubam clover for fodder, seed and green manuring and its effect on soil fertility as judged by the yield of following Maize.

1. BASAL CONDITIONS:
   (i) (a) Hubam clover - Maize. (b) Hubam clover. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 18.7.1952. (iv) (a) Ploughing once with victory and twice with desl plough. (b) to (e) N.A. (v) NIL
2. TREATMENTS:

Main-plot treatments:
4 levels of $P_2O_5$: $P_0=0$, $P_1=40$, $P_2=80$ and $P_3=120$ lb./ac.

Sub-plot treatments:
6 uses of clover: $C_1=$ Hubam clover grown for seed, $C_2=$ Hubam clover left for seed after one cutting, $C_3=$ Hubam clover green manured, $C_4=$ Hubam clover left after one cutting, $C_5=$ Hubam clover left after two cuttings and $C_6=$ Hubam clover grown for fodder.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication and 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A.

5. RESULTS:

(i) 758 lb./ac. (ii) (a) N.A. (b) N.A. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

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S.E.'s are not available.


Object: To study the response of Hubam clover to different doses of phosphatic manures grown for fodder, seed and green manuring and its effect on soil fertility as judged by the yield of following Maize crop.

1. BASAL CONDITIONS:

(i) (a) Hubam clover—Maize. (b) Hubam clover. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.7.1953. (iv) (a) Ploughing with desi plough. (b) N.A. (c) 18 seers. (d) and (e) N.A. (v) N.A. (vi) Maize yellow No. 2. (vii) Irrigated. (viii) 2 hoeings, weeding and filling up gaps. (ix) N.A. (x) 25 and 26.10.1953.

2. TREATMENTS:

Main-plot treatments:
4 levels of $P_2O_5$: $P_0=0$, $P_1=40$, $P_2=80$ and $P_3=120$ lb./ac.

Sub-plot treatments:
6 uses of clover: $C_1=$ Hubam clover grown for seed, $C_2=$ Hubam clover left for seed after one cutting, $C_3=$ Hubam clover green manured, $C_4=$ Hubam clover left after one cutting, $C_5=$ Hubam clover left after two cuttings and $C_6=$ Hubam clover grown for fodder.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication and 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) 1045 lb./ac.
(ii) (a) 384.0 lb./ac.
(b) 355.0 lb./ac.
(iii) C effect alone is highly significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. P marginal means = 128.0 lb./ac.
2. C marginal means = 95.9 lb./ac.
3. C means at the same level of P = 191.8 lb./ac.
4. P means at the same level of C = 265.7 lb./ac.

Crop := Maize (Kharif).
Ref := I.A.R.I. 53(34).
Type := ‘CM’.

Objective := To study the effect of different fertilizers and cultural practices on the yield of Maize.

1. BASAL CONDITIONS:
(i) (a) Maize-Oats. (b) Oats. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments.
(iv) (a) Ploughing with victory and desi plough. (b) to (e) N.A. (v) N, P and K at 80, 60 and 20 lb./ac., respectively. (vi) N.A. (vii) Irrigated. (viii) 2 cuttings for each main-plot, hoeing, thinning and weeding. (ix) N.A. (x) D₁ = 22, 23.9.1953, D₂ = 14.10.1953 and D₃ = 1.11.1953/9.11.1953.

2. TREATMENTS:
Main-plot treatments:
Sub-plot treatments:
3 earthings: E₁ = No, E₂ = 1 and E₃ = 2 earthings.
Sub-sub-plot treatments:
3 times of application of fertilizers: T₁ = Full dose at the time of sowing, T₂ = 1/2 dose at sowing and 1/2 at 1st earthing and T₃ = 1/2 dose at sowing, 1/2 at 1st earthing and 1/2 at 2nd earthing.
Fertilizer mixture was applied to give 80 lb. of N, 60 lb. of P₂O₅ and 20 lb. of K₂O.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/repetition ; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 34' x 25'. (b) 30' x 21'. (v) 2' around. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1951–1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1212 lb./ac.
(ii) (a) 515.8 lb./ac.
(b) 203.7 lb./ac.
(c) 201.0 lb./ac.
(iii) Main effects D, T and interaction D x T and D x E are significant. E effect is highly significant. Others are not significant.
Crop :- Maize (Kharif).

Object :- To study the effect of Napier grass on soil fertility and on the yield of subsequent cereal crops.

1. BASAL CONDITIONS:
   (i) (a) No. (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Maize 22.7.1952 and Napier 23, 24.6.1952. (iv)(a) Digging Napier roots of 2 years age, ploughing with victory plough once and twice with desh plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with oudh plough. (ix) N.A. (x) Maize 7.10.1952 and Napier 28.8.1952.

2. TREATMENTS:
   Main-plot treatments :
   4 rotations : R1=Control; Maize-Wheat, R2=Napier (2 yrs)—Maize-Wheat, Ra=Napier (3 yrs)—Maize-Wheat and R3=Napier (4 yrs)—Maize-Wheat.

   Sub-plot treatments :
   2 manures : M0=No manure and M1=40 lb./ac. of N as A/S.

3. DESIGN :
   (i) Split-plot. (ii) (a) 4 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) N.A. (iii) Yield of maize grain and napier fodder. (iv) (a) 1949—N.A. (b) Yes. (c) N.A.
   (v) (a) and (b) No. (vi) Crop failed due to early closure of monsoon and irrigations were also given late. (vii) Raw data N.A. Therefore results could not be presented in the proper form.

5. RESULTS :
   (i) to (iv) Av. yield of Maize in lb./ac. Av. yield of Napier grass in lb./ac.

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</tbody>
</table>

<table>
<thead>
<tr>
<th>R1</th>
<th>R2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>381.0</td>
<td>427.9</td>
<td>404.4</td>
</tr>
<tr>
<td>468.2</td>
<td>515.1</td>
<td>491.6</td>
</tr>
</tbody>
</table>

Mean 424.6 471.5 448.0
Crop :- Maize (Kharif).
Ref :- I.A.R.I. 53(3)
Type :- 'CM'.

Object :- To study the effect of Napier grass on soil fertility and on the yield of subsequent cereal crops.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Maize on 10.6.1953, Napier on 8, 9.7.1953. (iv) (a) Digging roots of Napier grass of 3 years age, ploughing with victory and desi plough. (b) to (e) N.A. (v) Nil. (vi) Maize yellow No. 2. (vii) Irrigated. (viii) Ploughing with desi plough and weeding. (ix) N.A. (a) Cowpeas : 9, 10.7.1953, Napier 20.8.1953. and Maize 3 to 6,9.1953.

2. TREATMENTS :
   Main-plot treatments :
   4 rotations: R1=Control : Maize-wheat, R2=Napier (2 years) — maize-wheat, R3=Napier (3 years) — maize-wheat and R4=Napier (4 years) — maize-wheat.
   Sub-plot treatments :
   2 manures: M0 = No manure and M1 = 40 lb./ac. of N as A/S.

3. DESIGN :
   (i) Split-plot. (ii) (a) 4 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 acre. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) N.A. (iii) Fodder yield. (iv) (a) 1950–1953. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Only 3 main-plots are taken for analysis.

5. RESULTS :
   (i) 3.52 ton/ac.
   (ii) (a) 0.79 ton/ac.
   (b) 0.53 ton/ac.
   (iii) Only M effect is significant.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M0</td>
<td>3.10</td>
<td>3.30</td>
<td>2.86</td>
<td>3.09</td>
</tr>
<tr>
<td>M1</td>
<td>4.25</td>
<td>4.00</td>
<td>3.59</td>
<td>3.95</td>
</tr>
<tr>
<td>Mean</td>
<td>3.68</td>
<td>3.65</td>
<td>3.22</td>
<td>3.52</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. R. marginal means =0.323 ton/ac.
2. M marginal means =0.177 ton/ac.
3. M means at the same level of R =0.307 ton/ac.
4. R means at the same level of M =0.388 ton/ac.

Crop :- maize.
Ref :- I.A.R.I. 53(127).
Type :- 'CM'.

Object :- To study the effect of different manures on seed yield with different rotations.

1. BASAL CONDITIONS :
   (i) (a) First year : Maize+oats, second year : Maize+peas, third year : Maize+wheat, fourth year : Maize+gram. (4 year rotation to be conducted 8 course for rotation). (b) Oats. (c) As per treatments. (ii) (a) Light loam. (b) N.A. (iii) 25.6.1953. (iv) (a) 4 to 6 desi ploughings. (b) and (c) N.A. (d) Between rows=2", within row=1". Rows to run east to west. (e) Thinned to one strong seedling per hole. (v) Nil. (vi) Pusa yellow (medium). (vii) Unirrigated. (viii) Intercultivation and weeding. (ix) 42.39°. (x) 5.10.1953.
2. TREATMENTS:
1. Control.
2. F.Y.M. at 8000 lb./ac.
3. Rape cake at 40 lb./ac. of N.
4. A/S at 40 lb./ac. of N
5. Pot. Sul. at 50 lb./ac. of K<sub>2</sub>O.
6. Super at 80 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
7. Tr. 4+Tr. 5.
8. Tr. 4+Tr. 6.
9. Tr. 5+Tr. 6.
10. Tr. 4+Tr. 5+Tr. 6.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 44' x 24'. (b) 37.5' x 18'. (v) Yes. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Nil. (iii) Weight of cob and grain. (iv) (a) 1953—1961 (8th year of the Expt.). (b) Yes. (c) Nil. (v) (a) No. (b) Nil. (vi) Nil. (vii) Experiment conducted at Botanical Sub-station, Pusa (Bihar).

5. RESULTS:
(i) 377 lb./ac.
(ii) 57.43 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>1.</td>
<td>276</td>
</tr>
<tr>
<td>2.</td>
<td>467</td>
</tr>
<tr>
<td>3.</td>
<td>572</td>
</tr>
<tr>
<td>4.</td>
<td>386</td>
</tr>
<tr>
<td>5.</td>
<td>250</td>
</tr>
</tbody>
</table>

S.E./mean = 28.71 lb./ac.

Crop : Maize.
Ref : I.A.R.I. 51(41)
Type : ‘D’.

Object : To study the effect of soaking seeds of Maize in dilute solutions of fertilizers on the yield.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) and (b) Refer item 11 on page 143. (iii) Maize 6.7.1951 and Oats N.A. (iv) (a) Maize : Tractor ploughing and discing 1st week July 1951. Oats : Desi plough twice after Palewa on 1.12.1951. (b) to (e) N.A. (v) C/N top dressed in Oats on 17.1.1952 along with irrigation. (vi) N.A. (vii) Irrigated. (viii) Hoeing in maize twice on August 1951 and hoeing in oats 1st week of Feb. 1952. (ix) N.A. (x) Maize Oct. 1951 and oats May 1952.

2. TREATMENTS:
Soaking of seeds.
1. No soaking.
2. Soaking in 5% solution of A/S.
3. Soaking in 5% solution of Super.
4. Soaking in 5% solution of Amm. Phos.
5. Soaking in water.

3. DESIGN:
(i) R.B.D. (ii) (a) 5 each for maize and oats. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 38' x 23'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Maize poor and oats normal. (ii) Nil. (iii) Yield of grain for maize and oat crops. (iv) (a) 1951—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Results of experiment conducted for oats crop may be seen under relevant crop.

5. RESULTS:
(i) 717 lb./ac.
(ii) 233.7 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of maize in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>890</td>
</tr>
<tr>
<td>2.</td>
<td>704</td>
</tr>
<tr>
<td>3.</td>
<td>296</td>
</tr>
<tr>
<td>4.</td>
<td>696</td>
</tr>
<tr>
<td>5.</td>
<td>996</td>
</tr>
</tbody>
</table>

S.E./mean = 95.45 lb./ac.

Crop :- Jowar.  Ref :- I.A.R.I. 53(31 a)  Type :- 'C'.

Object :- To study the effect of premature and mature seed on the yield of Jowar.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 53(31) under MAIZE.

5. RESULTS:

(i) 116.8 lb./ac.
(ii) N.A.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>138.2</td>
</tr>
<tr>
<td>2.</td>
<td>115.2</td>
</tr>
<tr>
<td>3.</td>
<td>97.1</td>
</tr>
</tbody>
</table>

Crop :- Barley (Rabi).  Ref :- I.A.R.I. 51(55).  Type :- 'MV'.

Object :- To study the response of varieties of Barley to the application of N and P.

1. BASAL CONDITIONS:

(i) (a) Barley-Maize. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.12.1951. (iv) Double discing and three ploughings. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 7.4.1952.

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 levels of P_2O_5 as Super : P_0 =0, P_1 =30 and P_2 =60 lb./ac.

(3) 2 varieties : V_1=Pusa-13 and V_2=6-521.

3. DESIGN:

(i) 3x3x2 Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 38'x25'. (b) 33'x20'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Medium to heavy lodging in plots manured with N. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 - N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Hailstorm on 1.3.1952. (vii) Nil.

5. RESULTS:

(i) 1122 lb./ac.
(ii) 257.6 lb./ac.

(iii) Main effects of N and V are significant. Others are not significant.
(iv) Average yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
<th>V1</th>
<th>V2</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>888</td>
<td>1119</td>
<td>1132</td>
<td>1046</td>
<td>1230</td>
</tr>
<tr>
<td>P1</td>
<td>970</td>
<td>1175</td>
<td>1284</td>
<td>1143</td>
<td>1340</td>
</tr>
<tr>
<td>P2</td>
<td>928</td>
<td>1155</td>
<td>1449</td>
<td>1177</td>
<td>1320</td>
</tr>
<tr>
<td>Mean</td>
<td>929</td>
<td>1150</td>
<td>1220</td>
<td>1122</td>
<td>1297</td>
</tr>
<tr>
<td>V1</td>
<td>1096</td>
<td>1296</td>
<td>1498</td>
<td>1340</td>
<td>1340</td>
</tr>
<tr>
<td>V2</td>
<td>761</td>
<td>1003</td>
<td>1078</td>
<td>946</td>
<td>946</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N or P = 52.6 lb./ac.
S.E. of marginal mean of V = 45.2 lb./ac.
S.E. of body of N x P table = 91.1 lb./ac.
S.E. of body of P x V or N x V table = 73.6 lb./ac.

Crop: Barley (Rabi).
Ref: I.A.R.I. 52(77)
Type: 'MV'.

Object:—To study the response of varieties of Barley to the application of N and P.

1. BASAL CONDITIONS:
   (i) (a) Barley-Maize. (b) Maize. (c) N.A. (iii) (a) and (b) Refer item 11 on page 143. (iii) 30.10.1952.
   (iv) (a) Dest ploughing and tractor disking. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated.
   (viii) to (x) N.A.

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. of N.
   (2) 3 levels of P2O5:  P0=0, P1=30 and P2=60 lb./ac. of P2O5.
   (3) 2 varieties of barley:  V1=Pusa 13 and V2=Kanpur 251.

   Fertilizers applied on 29.10.1952.

3. DESIGN:
   (i) 3 x 3 x 2 Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 38' x 25'. (b) 36' x 23'. (v) 1' around. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) Yes. (vi) No. (vii) Nil.

5. RESULTS:
   (i) 2072  lb./ac.
   (ii) 302.2 lb./ac.
   (iii) Main effect of N is highly significant, main effect of P and interactions N x P and V x P are significant.
   while others are not significant.
   (iv) Average yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
<th>V1</th>
<th>V2</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>1762</td>
<td>1935</td>
<td>2127</td>
<td>1942</td>
<td>2007</td>
</tr>
<tr>
<td>P1</td>
<td>1650</td>
<td>2048</td>
<td>2498</td>
<td>2069</td>
<td>2167</td>
</tr>
<tr>
<td>P2</td>
<td>1713</td>
<td>2209</td>
<td>2696</td>
<td>2206</td>
<td>2185</td>
</tr>
<tr>
<td>Mean</td>
<td>1712</td>
<td>2064</td>
<td>2440</td>
<td>2072</td>
<td>2120</td>
</tr>
<tr>
<td>V1</td>
<td>1782</td>
<td>2082</td>
<td>2496</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>1641</td>
<td>2047</td>
<td>2384</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Barley (Rabi).

Ref: I.A.R.I. 53 (73). Type: 'MV'.

Object: To study the response of varieties of Barley to the application of N and P.

1. BASAL CONDITIONS:
   (i) (a) Barley—Maize. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.10.1953 and 31.10.1953. (iv) (a) One victory and 2 desi ploughings and preparation of land with desi plough. (b) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding and taking out smutted plants. (ix) N.A. (x) 22 to 24.3.1954.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N_0 = 0, N_1 = 20, and N_2 = 40 lb./ac.
   (2) 3 levels of P_2O_5: P_0 = 0, P_1 = 30, and P_2 = 60 lb./ac.
   (3) 2 varieties: V_1 = N.P. 13 and V_2 = Kanpur 251.

3. DESIGN:
   (i) 3 x 3 x 2 Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 38' x 25'. (b) 36' x 23'. (v) 1' around. (vi) Yes. (vii) Nil.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2087 lb./ac.
   (ii) 725.4 lb./ac.
   (iii) None of the effects 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>V_1</th>
<th>V_2</th>
</tr>
</thead>
</table>
   P_0 | 2052 | 1910 | 2098 | 2020 | 2113 | 1927 |
   P_1 | 2048 | 2229 | 2016 | 2098 | 2157 | 2038 |
   P_2 | 2311 | 2081 | 2042 | 2145 | 2227 | 2063 |
   Mean | 2137 | 2073 | 2052 | 2087 | 2166 | 2009 |

   S.E. of marginal mean of N or P = 61.69 lb./ac.
   S.E. of marginal mean of V = 50.36 lb./ac.
   S.E. of body of N x P table = 106.80 lb./ac.
   S.E. of body of N x V or P x V table = 87.22 lb./ac.

Object:—To study the effect of sowing premature and mature seeds on Barley yield.

1. BASAL CONDITIONS to 4. GENERAL.
   Please refer to No. I.A.R.I. 53(32) on WHEAT.

5. RESULTS:
   (i) 2510 lb./ac.
   (ii) 218.9 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.

   Treatment          Av. yield
   1.                2834
   2.                2487
   3.                2210
   S.E./mean        =?7.35 lb./ac.


Object:—To study the effect of sowing premature and mature seed on Barley yield.

1. BASAL CONDITIONS to 4. GENERAL:
   Please refer to No. I.A.R.I. 52(27) on WHEAT.

5. RESULTS:
   (i) 4040 lb./ac.
   (ii) 311.8 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

   Treatment          Av. yield
   1.                3530
   2.                3305
   3.                5284
   S.E./mean        = 110.26 lb./ac.


Object:—To study the effect of organic and inorganic manuring on the yield of crops in rotations.

1. BASAL CONDITIONS:
   (i) (a) As per treatments. (b) and (e) N.A. — (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 28.7.1952
   (iv) (a) 1 ploughing and 2 discings with tractor and 1 beaming. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 weeding and 1 hoeing. (ix) 12.89°. (x) 11 to 24.10.1952; 21.10.1952 to 8.11.1952.

2. TREATMENTS:
   Main-plot treatments:
   3 crop rotations: R<sub>1</sub>=Bajra-Wheat, R<sub>2</sub>=Fallow-Wheat and R<sub>3</sub>=Bajra-Fallow.

   Sub-plot treatments:
   5 levels of F.Y.M.: F<sub>0</sub>=0, F<sub>1</sub>=2.5, F<sub>2</sub>=5, F<sub>3</sub>=10 and F<sub>4</sub>=20 ton/ac.

   Sub-sub-plot treatments:
   3 levels of N as Sod. Nit.: N<sub>0</sub>=0, N<sub>1</sub>=20 and N<sub>2</sub>=40 lb./ac.

   Manures applied to Bajra in R<sub>1</sub> and R<sub>2</sub> and to Wheat in R<sub>3</sub>. F.Y.M. applied on 8.7.1952 and Sod. Nit. on 2.9.1952.

3. DESIGN:
   (f) Split-plot. (ii) (a) 3 main-plots/replication; 5 sub-plots/main-plot; 3 sub-sub-plots/sub-plot. (b) N.A.
   (iii) 3. (iv) (a) N.A.; (b) 58’x121’. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Fairly good on the whole. (ii) Green ear disease (sclerospora-graminicola) 4% attack on harvest.
Pyrrilla-incidence severe as the nearby Sugarcane was affected badly. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) For wheat the number of replications is 5 and for Bajra 6.

5. RESULTS:
(i) 999.0 lb./ac.
(ii) (a) 200.4 lb./ac.
(b) 152.4 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of bajra 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>958</td>
<td>1008</td>
<td>973</td>
<td>947</td>
</tr>
<tr>
<td>F₁</td>
<td>945</td>
<td>1008</td>
<td>1007</td>
<td>987</td>
</tr>
<tr>
<td>F₂</td>
<td>985</td>
<td>921</td>
<td>967</td>
<td>958</td>
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<tr>
<td>F₃</td>
<td>922</td>
<td>1017</td>
<td>1047</td>
<td>995</td>
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<td>F₄</td>
<td>1074</td>
<td>1124</td>
<td>1130</td>
<td>1109</td>
</tr>
<tr>
<td>Mean</td>
<td>977</td>
<td>996</td>
<td>1025</td>
<td>999</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. F marginal means = 66.8 lb./ac.
2. N marginal means = 39.4 lb./ac.
3. N means at the same level of F = 88.2 lb./ac.
4. F means at the same level of N = 98.1 lb./ac.

Crop : Bajra (Kharif)

Object : To study the effect of organic and inorganic manuring on the yield of crops in rotations.

1. BASAL CONDITIONS:
(i) (a) to (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1, 2.7.1953. (iv) (a) 5 ploughings and 2 beamings. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Nil. (viii) Weeding and hoing with horse hoe. (ix) 15.7.1. (x) I picking 15 to 23.9.1953 II picking on 7 to 13.10.1953.

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 ton/ac.

Sub-sub-plot treatments:
3 levels of N as Sod. Nit.: N₀=0, N₁=20 and N₂=40 lb./ac.

Manures applied to Bajra in R₁ and R₃ and to Wheat in R₃. F.Y.M. applied during 7 to 12,6.1953 and Sod. Nit. on 1, 2.7.1953.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication, 5 sub-plots/main-plot, 3 sub-sub-plots/sub-plot. (b) N.A.
(iii) 3. (iv) (a) N.A. (b) 58'x131'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair to good. Better in R₃ rotation. (ii) Green ear disease in about 8% of ears. Smut attack in about 28% of ears. (iii) Grain yield. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Only 2 replications are taken for analysis of Bajra.
5. RESULTS:

(i) 1456 lb./ac.
(ii)
(a) 314.3 lb./ac.
(b) 566.1 lb./ac.
(c) 218.1 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>Mean</th>
<th>N₀</th>
<th>N₁</th>
<th>N₃</th>
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<td>1802</td>
<td>1605</td>
<td>1786</td>
<td>2016</td>
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</table>

Mean: 1234 - 1679 = 1456

S.E. of difference of two
1. R marginal means = 81.15 lb./ac.
2. F marginal means = 188.70 lb./ac.
3. N marginal means = 56.31 lb./ac.
4. N means at the same level of R = 97.53 lb./ac.
5. R means at the same level of F = 113.70 lb./ac.
6. N means at the same level of F = 125.92 lb./ac.
7. F means at the same level of N = 214.90 lb./ac.
8. F means at the same level of R = 326.85 lb./ac.
9. R means at the same level of F = 303.39 lb./ac.

Crop: Bajra (Kharif).
Ref: I.A.R.I. SSR(61). Type: 'M'.

Object: To determine the optimum level of N for top dressing and its time of application in relation to different spacings between rows of Bajra crop.

1. BASAL CONDITIONS:
   (i) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 1st Rep. 28.7.1953; 2nd Rep. 18.9.1953. (iv) (a) Tractor discing, desi ploughing and working with cultivator. (b) N.A. (c) 6 hrs./ac. (d) As per treatments. (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Removal of Baru grass and weeding. (ix) N.A. (x) 15, 16, 10, 1953.

2. TREATMENTS:
   All combinations of (1), (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=half at sowing and half at tillering and T₃=half at sowing+½ at tillering+½ at earing.
   3. 3 spacings: S₁=9", S₂=12" (Control) and S₃=15".

3. DESIGN:
   (i) 3 factorial. (ii) (a) 3 blocks of 9 plots each. (b) N.A. (iii) 2. (iv) (a) 14"x62.2". (b) 12"x60". (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1953-N.A. (b) Yes. (c) N.A. (e) N.A. (f) No. (vi) There was heavy rains after sowing of the crop. Delayed sowing in second replication, due to heavy rains on 29.7.1953. (vii) Nil.

271
5. RESULTS:

(i) 916 lb./ac.
(ii) 188.46 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>Mean</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
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<td>950</td>
<td>897</td>
<td>940</td>
<td>910</td>
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<td>923</td>
<td>916</td>
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S.E. of any marginal mean = 44.43 lb./ac.
S.E. of body of table = 76.95 lb./ac.

Crop: Bajra.
Ref: I.A.R.I. 53(31b). Type: 'C'.

Object: To study the effect of premature and mature seed on the yield of Cowpeas.

1. BASAL CONDITIONS to 4. GENERAL.
   Please refer to No. I.A.R.I. 53 (31) under MAIZE.

5. RESULTS:

(i) 203.5 lb./ac.
(ii) N.A.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>207.4</td>
</tr>
<tr>
<td>3.</td>
<td>167.0</td>
</tr>
</tbody>
</table>

S.E./mean = 64.0 lb./ac.

Crop: Bajra.
Ref: I.A.R.I. 52(28b). Type: 'C'.

Object: To study the effect of sowing premature and mature seed on Bajra yield.

1. BASAL CONDITIONS to 4. GENERAL.
   Please refer to No. I.A.R.I. 52 (28) under MAIZE.

5. RESULTS:

(i) 3347 lb./ac.
(ii) 156.8 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3445</td>
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<tr>
<td>2.</td>
<td>3393</td>
</tr>
<tr>
<td>3.</td>
<td>3203</td>
</tr>
</tbody>
</table>

S.E./mean = 64.0 lb./ac.

Object : To determine the nutritional requirements of Indian soils.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Ref item 11 on page 143. (iii) Oats on 4.11.1950, Tobacco on 17.1.1951 and Rape on 29.12.1950. (iv) (a) Tractor discing twice. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Bakl娘ing to rape and oats on 29.12.1950. Hand hoeing to tobacco on 8.2.1951. Topping and suckerling of tobacco on 16.4.1951 and 17.4.1951. (ix) N.A. (x) Rape on 5.4.1951. Oats on 8, 9.4.1951 while tobacco N.A.

2. TREATMENTS:
   1. Control.
   2. N at 40 lb./ac.+P₂O₅ at 60 lb./ac.+K₂O at 30 lb./ac.
   3. Treatment 2+Mag. sul. at 10 lb./ac.
   4. Treatment 2+Mag. sul. at 5 lb./ac.
   5. Treatment 2+Zinc sul. at 5 lb./ac.
   6. Treatment 2+Borax at 5 lb./ac.
   7. Treatment 2+Fe. sul. at 5 lb./ac.
   8. Treatment 2+Treatments 3, 4, 5, 6 and 7.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8 for each crop. (b) N.A. (iii) 4, (iv) (a) N.A. (b) 35°×18'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) 20% locust attack on rape on 29.1.1951. (iii) Rape and oats seed yield. (iv) (a) 1950—N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) N.A. (vii) No observations were taken on the field of tobacco. Results of experiments on rape may please be seen under the relevant crop.

5. RESULTS:
   (i) 941 lb./ac.
   (ii) 513.5 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>1932</td>
<td>6.</td>
<td>2497</td>
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<td>2.</td>
<td>2385</td>
<td>7.</td>
<td>2480</td>
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<td>3.</td>
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<td>2618</td>
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<td>4.</td>
<td>2593</td>
<td>8.</td>
<td>2411</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>256.7 lb./ac.</td>
<td></td>
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</table>


Object : To determine the nutritional requirement of Indian soils.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) As per treatments. (ii) (a) and (b) Ref item 11 on page 143. (iii) Oats : 29.11.1951, Rape : 29.9.1951, 24.10.1951 (Resowing) and Tobacco (Transplanting) on 23, 24, 25.1.1952. (iv) (a) Oats ploughing with victory plough on 26.10.1951 with de1i plough on 24.11.1951 and 29.11.1951. (b) to (e) N.A. (v) N.I. (vi) N.A. (vii) Irrigated. (viii) Tobacco—hand hoeing from 8.2.1952 to 11.2.1952 and from 10.3.1952 to 14.3.1952, oats—micro nutrients sprayed on 14, 15.2.1952 and rape micro nutrients sprayed on 14.2.1952. (ix) N.A. (x) Oats : 27 to 31.3.1952 and Rape 14 to 18.3.1952.

2. TREATMENTS:
   1. Control.
   2. N at 40 lb./ac.+P₂O₅ at 60 lb./ac.+K₂O at 30 lb./ac.
   3. Treatment 2+Mag. sul. at 10 lb./ac.
   4. Treatment 2+Mag. sul. at 5 lb./ac.
   5. Treatment 2+Zinc sul. at 5 lb./ac.
   6. Treatment 2+Borax at 3 lb./ac.
   7. Treatment 2+Fe. sul. at 5 lb./ac.
   8. Treatment 2+Treatments 3, 4, 5, 6 and 7.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8 for oats, rape and tobacco. (b) N.A. (iii) 4, (iv) (a) N.A. (b) 35°×18'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. little lodging by hail storm. (ii) N.A. (iii) Yield of grain and tobacco leaf. (iv) (a) 1950 to 1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) N.A. (vii) Results of experiments on rape and tobacco may be seen under the relevant crops.
RESULTS:

(i) 2116 lb./ac.
(ii) 91.34 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1161</td>
<td>5.</td>
<td>2287</td>
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<tr>
<td>2.</td>
<td>2252</td>
<td>6.</td>
<td>2270</td>
</tr>
<tr>
<td>3.</td>
<td>2252</td>
<td>7.</td>
<td>2311</td>
</tr>
<tr>
<td>4.</td>
<td>2158</td>
<td>8.</td>
<td>2406</td>
</tr>
</tbody>
</table>

S.E./mean = 45.67 lb./ac.

Crop := Oats.
Ref := I.A.R.I. 50(15).
Type := 'M'.

Object := To study the relative utility of mixed cropping kharif cereals and cowpeas in different proportions over individual cropping and to study their residual effect on the succeeding Oats crop.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.11.1950. (iv) (a) Tractor grubbing on 17.11.1950. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Lever harrowing in December, 1950. (ix) N.A. (x) April, 1951.

2. TREATMENTS:
1. Maize alone for seed.
7. Cowpeas alone for fodder.
8. Cowpeas alone for seed.
9. Maize+Cowpeas 1:1 for grain.
10. Maize+Cowpeas 1:1 for fodder.
11. Maize+Cowpeas 1:1 for grain.
18. Fallow during kharif.

3. DESIGN:
(i) R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 52'x20'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Insects in previous cowpeas crop. (iii) Grain yield. (iv) (a) 1949—N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 962 lb./ac.
(ii) 808.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
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<tr>
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<td>994</td>
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<td>3.</td>
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<td>12.</td>
<td>1015</td>
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<tr>
<td>4.</td>
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<td>13.</td>
<td>964</td>
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<td>14.</td>
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<td>911</td>
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<tr>
<td>9.</td>
<td>1120</td>
<td>18.</td>
<td>764</td>
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</table>

S.E./mean = 404.0 lb./ac.
Crop: Oats (Rabi)
Ref: I.A.R.I. 51(3)
Type: 'M'

Object: To study the effect of placement of fertilizers on yield of maize and their residual effect on Oats.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) N.A.
   (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 28.11.1950. (iv) (a) and (b) 2 discings, grubbing twice and beaming. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil.
   (ix) N.A. (x) 25.4.1951.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 methods of application of fertilizers: M1=Broadcast, M2=Fertilizers placed 21/2' deep in seed line and M3=Fertilizers placed 41/2' deep in seed line.
   (2) 3 levels of P2O5 as super: P1=40, P2=60 and P3=120 lb./ac.
   (3) 3 levels of N as A/S: N1=20, N2=30 and N3=60 lb./ac.
   Treatments applied to kharif Maize in 1950.

3. DESIGN:
   (i) 3a confounded. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 128' x121'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Patchy growth. (ii) Nil. (iii) Grain yield. (iv) (a) 1949-1950. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 812.2 lb./ac.
   (ii) 172.9 lb./ac.
   (iii) Interaction P X M alone is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
<th>M1</th>
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<tr>
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<td>830.4</td>
<td>694.2</td>
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<td>825.8</td>
<td>748.7</td>
<td>798.6</td>
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<td>884.8</td>
<td>803.1</td>
<td>821.3</td>
<td>836.4</td>
<td>848.5</td>
<td>807.7</td>
<td>853.0</td>
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<td>785.0</td>
<td>912.0</td>
<td>809.2</td>
<td>939.3</td>
<td>665.2</td>
<td>803.1</td>
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<tr>
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<td>815.2</td>
<td>760.8</td>
<td>860.6</td>
<td>812.2</td>
<td>871.2</td>
<td>747.2</td>
<td>818.2</td>
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</table>

S.E. of any marginal mean = 40.8 lb./ac.
S.E. of body of any table = 70.6 lb./ac.

Crop: Oats (Rabi)
Ref: I.A.R.I. 51(3)
Type: 'M'

Object: To study the effect of placement of fertilizers on yield of maize and the residual effect on Oats.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 16.11.1951. (iv) (a) Discing twice with tractor, grubbing twice and beaming. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Harrowing on 18.11.1951. (ix) N.A. (x) 10.4.1952.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 methods of application of fertilizers: M1=Broadcast, M2=Fertilizers placed 21/2' deep in seed line and M3=Fertilizers placed 41/2' deep in seed line.
   (2) 3 levels of P2O5 as super: P1=40, P2=60 and P3=120 lb./ac.
   (3) 3 levels of N as A/S: N1=20, N2=30 and N3=60 lb./ac.
   Treatments applied to kharif Maize in 1951.
3. DESIGN:
(i) 3² confounded. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 109'x10'. (b) 107'x9'. (v) 1' on each side of length and 1' on each side of width. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1949—1951. (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1031 lb./ac.
(ii) 267.3 lb./ac.
(iii) Main effect of N alone is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
<th>M₁</th>
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<td>1031</td>
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<tr>
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<td>1395</td>
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</tbody>
</table>

S.E. of any marginal mean = 63.0 lb./ac.
S.E. of body of any table = 109.1 lb./ac.

Crop = Oats.  
Ref = I.A.R.I. 51(41 a).  
Type = 'M'.

Object:—To study the effect of soaking seeds of Oats in dilute solutions of fertilizers on the yield.

1. BASAL CONDITIONS to 4. GENERAL:
Please refer to No. I.A.R.I. 51(41) under MAIZE.

5. RESULTS:
(i) 1573 lb./ac.
(ii) 842.6 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

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<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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<td>3.</td>
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<td>4.</td>
<td>1604</td>
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<td>5.</td>
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S.E./mean = 144.0 lb./ac.

Crop = Oats (Rabi).  
Ref = I.A.R.I. 52(64).  
Type = 'M'.

Object:—To study the effect of soaking seed in solutions of fertilizers.

1. BASAL CONDITIONS:
(i) (a) Oats-Maize. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 6.11.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Nil. (viii) Hoeing with suit plough. (ix) N.A. (x) April 1953.
2. TREATMENTS:
1. No soaking.
2. Soaking in 5% A/S solution.
3. Soaking in 5% Super (neutralised with lime).
5. Soaking in water.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 40' x 15'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1953. (b) Yes. (c) N.A. (v) (a) and (b) No.
(vi) and (vii) Nil.

5. RESULTS:
(i) 1299 lb./ac.
(ii) 439.2 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

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S.E./mean = 179.3 lb./ac.

Crop :- Oats (Rabi). Ref :- I.A.R.I. 53(59). Type 'M'.

Object :- To study the effect of soaking seeds in solution of fertilizers.
Crop: Oats (Rahi)

Object: To study the residual effect of different cultural practices and manures, applied to maize, on the succeeding Oat crop.

1. BASAL CONDITIONS:
   (i) (a) Maize—Oats. (b) Maize. (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) As per treatments. (iv) (a) Tractor ploughing and preparing land with desi plough. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) One hoeing, thinning and weeding. After every earthing bunds are prepared with hand. (x) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 dates of sowing: D1=18.6.1952, D2=7.7.1952 and D3=27.7.1952. 
   Sub-plot treatments:
   3 earthings: E0=No, E1=1 and E2=2 earthings.
   Sub-sub-plot treatments:
   3 times of application of fertilizers: T1=Full dose at sowing, T2= at sowing+ four weeks after sowing and T3= at sowing+ four weeks after sowing+ six weeks after sowing.
   Fertilizers applied as a mixture of N, P and K at 80, 60 and 20 lb. respectively.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 3 main-plots/block, 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A.  (iii) 4. (iv) (a) 34’x25’. (b) 30’x21’. (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Fair.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1951—1953.  (b) Yes. (c) N.A.  (d) (a) and (b) No. (vi) and (vii) Nil!

5. RESULTS:
   (i) 1413 lb./ac.
   (ii) (a) 691.1 lb./ac.
   (b) 375.2 lb./ac.
   (c) 340.6 lb./ac.
   (iii) Main effects of D, E and T are significant. Others are not significant.
   (iv) Av. yield of grain in lb./ac.

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S.E. of difference of two
1. D marginal means =162.8 lb./ac.
2. E marginal means = 88.4 lb./ac.
3. T marginal means = 80.3 lb./ac.
4. E means at the same level of D =176.7 lb./ac.
5. D mean at the same level of E =205.3 lb./ac.
Crop: Oats (Rabi).

Ref: I.A.R.I. 53(33).

Type: ‘CM’.

Object: To study the residual effect of different cultural practices and manures, applied to maize, on the succeeding Oats crop.

1. BASAL CONDITIONS:
   (i) (a) Maize—Oats. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Ploughing with victory plough on 6.10.1953. (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 16, 17 and 18.4.1952.

2. TREATMENTS:
   Main-plot treatments:
   - 3 earthings: E_0=No, E_1=1 and E_2=2 earthings.
   Sub-sub-plot treatments:
   - 3 times of application of fertilizers: T_1=Full dose at sowing, T_2=1/2 at sowing+1/2 four weeks after sowing and T_3=1/2 at sowing+1/2 four weeks after sowing+1/2 six weeks after sowing.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 34’x25’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1116 lb./ac.
   (ii) (a) 373 6 lb./ac.
   (b) 247 7 lb./ac.
   (c) 199 1 lb./ac.
   (iii) None of the effects or interactions are significant.
   (iv) Av. yield of grain in lb./ac.

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</table>

S.E. of difference of two
1. D marginal means = 88 1 lb./ac. 6. T means at the same level of D = 81 3 lb./ac.
2. E marginal means = 58 4 lb./ac. 7. D means at the same level of T = 110 3 lb./ac.
3. T marginal means = 46 9 lb./ac. 8. T means at the same level of E = 81 3 lb./ac.
4. E means at the same level of D = 101 1 lb./ac. 9. E means at the same level of T = 88 4 lb./ac.
5. D means at the same level of E = 120 7 lb./ac.
Crop: Oats (Redi).

Object: To study the effect of spacing, fertilizers and their method of application on maize crop and the residual effect on Oats.

1. BASAL CONDITIONS:
   (i) (a) Oats-Maize. (b) and (c) N.A.
   (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 8.12.1950.
   (iv) (a) Double discing was done along with double beaming with bullocks. (b) to (e) N.A.
   (v) N.A.
   (vi) N.A.
   (vii) Irrigated.
   (viii) N.A.
   (ix) N.A.
   (x) 22.4.1951.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of basal manure: B₀ = Nil and B₁ = F.Y.M. at 20 lb./ac. of N.
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 2 methods of application of fertilizers: M₁ = Broadcast and M₂ = Placement.
   (2) 3 sparcings between rows: S₁ = 2', S₂ = 2½' and S₃ = 3'.
   Sub-sub-plot 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) 2 levels of P₂O₅ + K₂O: P₁ = Super at 40 lb./ac. of P₂O₅ + Pot. Sul. at 20 lb./ac. of K₂O and P₂ = Super at 80 lb./ac. of P₂O₅ + Pot. Sul. at 20 lb./ac. of K₂O.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plot/replication; 6 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A.
   (iii) 2. (iv) (a) 48' x 24'. (b) 2½' x 20'. (v) 2' on each side. (vi) Yes.
   (vii) Nil.
   (viii) N.A.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Grain yield. (iv) (a) 1949—1951. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1651 lb./ac.
   (ii) 186.2 lb./ac.
   (b) 286.8 lb./ac.
   (c) 241.7 lb./ac.
   (iii) Only sub-sub-plot treatments differ highly significantly.
   (iv) Av yield of grain in lb./ac.
   
<table>
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S.E. of difference of two
1. Main-plot marginal means = 31.0 lb./ac.
2. Sub-plot marginal means = 83.8 lb./ac.
3. Sub-sub-plot marginal means = 69.8 lb./ac.
4. Sub-plot means at the same level of main-plot treatment = 95.3 lb./ac.
5. Main-plot means at the same levels of sub-plot treatment = 98.7 lb./ac.
6. Sub-sub-plot means at the same level of main-plot treatment = 111.3 lb./ac.
7. Main-plot means at the same level of sub-sub-plot treatment = 117.1 lb./ac.
8. Sub-sub-plot means at the same level of sub-plot treatment = 170.9 lb./ac.
9. Sub-plot means at the same level of sub-sub-plot treatment = 176.8 lb./ac.
Crop :- Oats (Rabi).
Ref :- L.A.R.I. 51(20)
Type :- ’CM’.

Object :- To study the effect of spacing, fertilizers and their method of application on maize crop and the residual effect on Oats.

1. BASAL CONDITIONS:
   (i) (a) Maize-Oats. (b) and (c) N.A. (iii) (a) and (b) Refer item 11 on page 143. (iii) 4.12.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) Last week of April 1952.

2. TREATMENTS:
   Main-plot treatments:
   - 2 levels of basal manure: B₀ = Nil and B₁ = F.Y.M. at 20 lb/ac. of N.
   Sub-plot treatments:
   - All combinations of (1) and (2)
     (1) 2 methods of applications of fertilizers : M₁ = Broadcast and M₂ = Placement.
   - 3 spacings between rows : S₁ = 2', S₂ = 2½' and S₃ = 3'.
   Sub-sub-plot 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) 2 levels of P₀₂₀ + K₂₀ : P₁ = Super at 40 lb/ac. of P₀₂₀ and P₂ = Super at 80 lb/ac. of P₀₂₀ + Pot. Sul.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication ; 6 sub-plots/main-plot and 6 sub-sub-plots/sub-plot. (b) N.A.
   (iii) 2. (iv) (a) 48'x42'. (b) 44'x20'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 19-9-1951. (b) Yes. (c) N.A. (v) (a) and (b). No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 764 lb/ac.
   (ii) (a) 1368 lb/ac.
   (b) 225.6 lb/ac.
   (c) 216.7 lb/ac.
   (iii) Only sub-sub-plots treatments differ significantly.
   (iv) Av. yield of grain in lb/ac.

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S.E. of difference of two
1. Main-plot marginal means = 228.1 lb/ac.
2. Sub-plot marginal means = 65.1 lb/ac.
3. Main-plot marginal means = 62.6 lb/ac.
4. Sub-plot means at the same level of main-plot = 241.9 lb/ac.
5. Main-plot means at the same level of sub-plot = 88.5 lb/ac.
6. Sub-sub-plot means at the same level of main-plot = 243.1 lb/ac.
7. Main-plot means at the same level of sub-sub-plot = 92.1 lb/ac.
8. Sub-sub-plot means at the same level of sub-plot = 153.2 lb/ac.
9. Sub-plot means at the same level of sub-sub-plot = 154.3 lb/ac.
Crop: Potato (Rabi).  
Ref: I.A.R.I. 51(57).  
Type: 'M'.

Object: To find out the optimum dose and the best method of application of the fertilizers.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.10.1951. (iv) (a) One ploughing with desi plough and laying out by victory plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) One weeding and two earthings. (ix) N.A. (x) 2-4.1952 and 3-4.1952.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of \( N: N_1 = 40, N_2 = 80 \) and \( N_3 = 120 \) lb/ac. of N.
   (2) 3 levels of \( P_2: P_1 = 30, P_2 = 60 \) and \( P_3 = 90 \) lb/ac. of \( P_2 \)
   (3) 3 depths of placement: \( D_0 = \text{Broadcast}, D_1 = \text{In row 1'} \text{ under the water and } D_2 = \text{In 2 row, 2'} \text{ to the side and 1'} \text{ under the other.}

Fertilizers applied on 25.10.1952.

3. DESIGN:
   (i) \( 3^3 \) Fact. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) 24'\times23'. (b) 24'\times16'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil.  (iii) Yield of potato.  (iv) (a) 1951—N.A. (b) and (c) N.A.  (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1.01 ton/ac.
   (ii) 0.139 ton/ac.
   (iii) Effect of N is highly significant. Interaction N×P and N×D are significant. Others are not significant.
   (iv) Av. yield of Potato in ton/ac.

<table>
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<tr>
<th></th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
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S.E. of any marginal mean =0.033 ton/ac.
S.E. of body of any table =0.057 ton/ac.

Crop: Potato (Rabi).  
Ref: I.A.R.I. 52(79).  
Type: 'M'.

Object: To study the effect of depth of ploughing and placement of fertilizers on the yield of Potato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17 and 18.10.1952. (iv) (a) One ploughing with tractor, one with victory plough, 13 with desi plough, discing and grubbing once. (b) to (e) N.A. (v) F.Y.M. at 120 mds broadcast as basal dose. (vi) D.A.R. (vii) Irrigated. (viii) 2 earthings and hoeing by wallace horse hoe and \( \text{khurpi} \). (ix) N.A. (x) 2 to 9.3.1953.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2)

(1) 3 ploughings: C_1=9' deep tractor ploughing followed by tractor cultivator, C_2=5' deep ploughing by country plough and C_3=5' deep ploughing by country plough.

(2) 2 placement of fertilizers: P_1=Placement with plough sole and P_2=Top dressed.

Sub-plot treatments:
4 levels of fertilizers:
F_1=120 lb./ac. of N, F_2=80 lb./ac. of N+60 lb./ac. of P_20_5+40 lb./ac. of K_2O, F_3=120 lb./ac. of N+60 lb./ac. of P_20_5+40 lb./ac. of K_2O and F_4=160 lb./ac. of N+80 lb./ac. of P_20_5+40 lb./ac. of K_2O.

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'x9.0'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Attack of late blight. (iii) Yield of potato. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 6.77 ton/ac.
(ii) (a) 0.99 ton/ac.
(b) 1.14 ton/ac.

(iii) Main effect of F is highly significant. Other effects and interactions are not significant.

(iv) Av. yield of potato in ton/ac.

<table>
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<tr>
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S.E. of difference of two
1. C marginal means =0.17 ton/ac. 5. C means at the same level of F=0.38 ton/ac.
2. P marginal means =0.14 ton/ac. 6. F means at the same level of P=0.51 ton/ac.
3. F marginal means =0.33 ton/ac. 7. P means at the same level of F=0.44 ton/ac.
4. F means at the same level of C =0.40 ton/ac. 8. means of body of C×P table =0.35 ton/ac.

Crop :- Potato (Rahi). Ref :- I.A.R.I. 53(78). Type :- 'CM'.

Object :- To study the effect of depth of ploughing and placement of fertilizers on the yield of Potato.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) N.A. (c) N.A. (d) (a) and (b) Refer item 11 on page 143. (iii) 18, 19.10.1953. (iv) (a) One ploughing by victory and seven by desi plough and 3 grubbings. (b) to (e) N.A. (v) N.A. (vi) D.R.R. (vii) Irrigated. (viii) 2 earthings. (ix) N.A. (x) 24 to 27.2.1954.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2)
(1) 4 ploughings: C1=10" deep ploughing by tractor+tractor operation, C2=6" deep ploughing by victory plough and C3=4'5" deep ploughing by country plough.
(2) 2 placement of fertilizers: P1=placement and P2=top dressing.

Sub-plot treatments:
4 levels of fertilizers:
Ft=120 lb./ac. of N, F2=80 lb./ac. of P2O5+80 lb./ac. of K2O, F3=120 lb./ac. of N+80 lb./ac. of P2O5+40 lb./ac. of K2O and F4=160 lb./ac. of N+80 lb./ac. of P2O5+40 lb./ac. of K2O.

Fertilizers applied just before planting.

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'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Very good but affected by frost in the latter stage. (ii) After frost, late attack of blight on the un-effected portion of leaves. (iii) Yield of potato. (iv) (a) 1952-N.A. (b) Yes. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 10.39 ton/ac.
(ii) (a) 0.176 ton/ac. (b) 0.243 ton/ac.
(iii) Main effect of C, P and F are highly significant. Interactions are not significant.
(iv) Av. yield of potato in ton/ac.

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<th>C3</th>
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S.E. of difference of two
1. C marginal means = .051 ton/ac.
2. P marginal means = .057 ton/ac.
3. F marginal means = .070 ton/ac.
4. F means at the same level of C = .121 ton/ac.
5. C means at the same level of F = .111 ton/ac.
6. F means at the same level of P = .069 ton/ac.
7. P means at the same level of F = .091 ton/ac.
8. mean of body of CxP table = .062 ton/ac.


Object: To study the effect of date of sowing, time of application of fertilizers and spacing between rows on Potato yield.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Preparing seed beds by deep plough after irrigating the land. (b) to (e) N.A. (v) A/S at 120 lb./ac. of N, Super at 60 lb./ac. of P2O5 and Pot. Sul: at 40 lb./ac. of K2O. (vi) N.A. (vii) Irrigated. (viii) 1st and 2nd earthing twice in each main-plot. (ix) N.A. (x) 25-3-1952 to 2-4-1952.
2. TREATMENTS:

Main-plot treatments:
3 dates of sowing: \( D_1 = 25.9.1951, D_2 = 15.10.1951 \) and \( D_3 = 5.11.1951 \).

Sub-plot treatments:
3 spacings between rows: \( S_1 = 1\', S_2 = 2\', S_3 = 3\' \).

Sub-sub-plot treatments:
3 times of application of fertilizers:
- \( T_1 \) = Full dose at sowing, \( T_2 \) = at sowing + 1 at first earthing and
- \( T_3 \) = at sowing + 1 at first earthing + 1 at second earthing.

Fertilizers given as under basal manuring.

3. DESIGN:
(i) Split-plot. (ii) 3 main-plots replication; 3 sub-plots/main-plot; 3 sub-sub-plots/sub-plot. (b) N.A.

4. RESULTS:
(i) 5.51 ton/ac.
(ii) (a) 0.98 ton/ac.
(b) 0.44 ton/ac.
(c) 0.48 ton/ac.

(iii) S and T effects are highly significant. All interactions are significant while D effect is not significant.

(iv) Av. yield of potato in ton/ac.

<table>
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<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
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<th>( T_2 )</th>
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<td>5.51</td>
<td>6.44</td>
<td>5.77</td>
<td>4.33</td>
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</table>

S.E. of difference of two
1. D marginal means = 0.23 ton/ac.
2. S marginal means = 0.10 ton/ac.
3. T marginal means = 0.11 ton/ac.
4. T means at the same level of \( D = 0.19 \) ton/ac.
5. D means at the same level of \( T = 0.03 \) ton/ac.
6. T means at the same level of \( S = 0.19 \) ton/ac.
7. S means at the same level of \( T = 0.22 \) ton/ac.
8. S means at the same level of \( D = 0.17 \) ton/ac.
9. D means at the same level of \( S = 0.27 \) ton/ac.

Crop: Potato (Rabi). Ref: I.A.R.I. 52(40). Type: 'CM'.

Object: To study the effect of date of sowing, time of application of fertilizers and spacing between rows on Potato yield.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Preparing seed beds by deep plough after irrigating the land. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1st and 2nd earthing thrice in each main-plot. (ix) N.A. (a) 7, 8, 10 to 12.4.1953.
2. TREATMENTS:

Main-plot treatments:
3 dates of sowing:
- \( D_1 = 24.9.1952 \)
- \( D_2 = 14.10.1952 \)
- \( D_3 = 4.11.1952 \)

Sub-plot treatments:
3 spacings between the rows:
- \( S_1 = 1' \)
- \( S_2 = 2' \)
- \( S_3 = 2' \)

Sub-sub-plot treatments:
3 time of application of fertilizers:
- \( T_1 = \) Full dose at sowing
- \( T_2 = \) at sowing + \( 1/2 \) at 1st earthing and
- \( T_3 = \) at sowing + \( 1/2 \) at 1st earthing + \( 1/2 \) at 2nd earthing.

3. DESIGN:
(i) Split-plot.
(ii) 3 main-plots/replication; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot.
(iii) 40'x15'.
(iv) 26'x13'.
(v) N.A.
(vi) Yes.

4. GENERAL:
(i) Fair. No lodging.
(ii) Heavy attack of mosaic, and cut-worm.
(iii) Yield of potato.
(iv) (a) 1951—N.A.
(b) Yes.
(c) N.A.
(v) (a) and (b) No.
(vi) and (vii) Nil.

5. RESULTS:
(i) 13.26 ton/ac.
(ii) (a) 1.76 ton/ac.
(b) 0.71 ton/ac.
(c) 0.67 ton/ac.
(iii) D effect is significant, T and S effects are highly significant and interactions are significant.
(iv) Av. yield of potato in ton/ac.

<table>
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<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>Mean</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
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S.E. of difference of two
1. D marginal means =0.41 ton/ac.
2. S marginal means =0.17 ton/ac.
3. T marginal means =0.16 ton/ac.
4. T means at a level of D =0.28 ton/ac.
5. D means at the same level of T =0.47 ton/ac.
6. T means at the same level of S =0.27 ton/ac.
7. S means at the same level of T =0.28 ton/ac.
8. S means at the same level of D =0.29 ton/ac.
9. D means at the same level of S =0.23 ton/ac.

Crop: Potato (Rabi).
Ref: I.A.R.I. 53(45). Type: 'CM'.

Object: To study the effect of sowing, time of application of fertilizers and spacing between the rows of Potato.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Ploughed twice with desi plough. The bunds and channels were prepared with victory plough. (b) to (e) N.A. (v) A/S at 6.19 lb., Super at 1.50 lb. and Pot. Sul. at 0.83 lb. for each sub-plot. (vi) N.A. (vii) Irrigated. (viii) Weeding and twice earthing. (ix) N.A. (x) 31.3.1954; 1 to 3.4.1954.
2. TREATMENTS:

Main-plot treatments:
3 dates of sowing: D₁, D₂ and D₃=N.A.

Sub-plot treatments:
3 spacings between rows: S₁=1’, S₂=2’ and S₃=2’.

Sub-sub-plot treatments:
3 times of application of fertilizer: T₁=Whole at the time of sowing, T₂=½ at sowing+½ at the first earthing and T₃=½ at sowing+½ at first earthing+½ at 2nd earthing.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication; 3 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30’X15’. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Yield of potato. (iv) (a) 1951—N.A. (b) and (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1.79 ton/ac.
(ii) (a) 0.75 ton/ac.
(b) 0.53 ton/ac.
(c) 0.39 ton/ac.

(iii) Effects of D and T are highly significant. S effect is significant. Others are not significant.

(iv) Av. yield of potato ton/ac.

<table>
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S.E. of difference of two

1. D marginal means =0.177 ton/ac. 5. D means at the same level of T =0.219 ton/ac.
2. S marginal means =0.125 ton/ac. 6. S means at the same level of T =0.180 ton/ac.
3. T marginal means =0.092 ton/ac. 7. S means at the same level of D =0.216 ton/ac.
4. T means at the same level of D or S=0.159 ton/ac. 8. D means at the same level of S =0.250 ton/ac.

Crop: Potato (Rabi).  Ref: I.A.R.I. 51(34). Type: 'IM'.

Object: To study the effect of manuring and irrigation along with different depth of furrows on the yield of Potato.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.10.1951. (iv) (a) One ploughing and one cross ploughing. (b) to (c) N.A. (v) 100 md. of F.Y.M./ac. (vi) N.A. (vii) Irrigated. (viii) Weeding after every irrigation. (ix) 2.83’. (x) 5, 6.4.1952.
2. TREATMENTS:
All combinations of (1), (2) and (3)
1. No. of irrigations: \( I_1 = 5, I_2 = 7 \) and \( I_3 = 9 \) irrigations.
2. Depth of furrows: \( F_1 = 4\text{'}, F_2 = 6\text{'}, F_3 = 9\text{'} \) deep.
3. 3 levels of N: \( N_1 = 40, N_2 = 80 \) and \( N_3 = 120 \) lb./ac.

3. DESIGN:
(i) 3^3 factorial. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 24\text{'x}15\text{'}.
(v) N.A. (vi) Yes.

4. GENERAL:
(i) Fairly good. (ii) Negligible attack of mosaic. (iii) Yield of potato. (iv) (a) No. (b) No. (c) N.A. (v) (a), (b) No. (vi) Crop damaged by hail storm. (vii) Nil.

5. RESULTS:
(i) 5.05 ton/ac. (ii) 0.47 ton/ac.
(iii) N and V effects are highly significant. Interaction \( F \times I \) and \( F \times N \) are significant. Others are not significant.
(iv) Av. yield of potato in ton/ac.

<table>
<thead>
<tr>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
<th>Mean</th>
<th>( F_1 )</th>
<th>( F_2 )</th>
<th>( F_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( I_1 )</td>
<td>4.25</td>
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</tr>
<tr>
<td>( I_2 )</td>
<td>5.05</td>
<td>5.68</td>
<td>5.31</td>
<td>5.35</td>
<td>4.93</td>
<td>6.12</td>
</tr>
<tr>
<td>( I_3 )</td>
<td>4.99</td>
<td>5.83</td>
<td>5.35</td>
<td>5.39</td>
<td>4.62</td>
<td>6.26</td>
</tr>
<tr>
<td>Mean</td>
<td>4.76</td>
<td>5.37</td>
<td>5.03</td>
<td>5.05</td>
<td>4.42</td>
<td>5.66</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.11 ton/ac.
S.E. of body of any table = 0.19 ton/ac.

Crop :- Potato. Ref :- I.A.R.I. 53(68). Type :- 'IM'.

Object :- To study the effect of depth of furrows, N and irrigation on the yield of Potato.

1. BASAL CONDITIONS:
(i) (a) No. (b) N.A. (c) N.A. (d) N.A. (e) and \( \& \) (b) Refer item 11 on page 143. (iii) 24.10.1953. (iv) (a) 4 cross ploughing by desi plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 2 earthings. (ix) N.A. (x) 1st week of March 1954.

2. TREATMENTS:
All combinations of (1), (2) and (3)
1. No. of irrigations: \( I_1 = 5, I_2 = 7 \) and \( I_3 = 9 \) irrigations.
2. Depth of furrows: \( F_1 = 4\text{'}, F_2 = 6\text{'}, F_3 = 9\text{'} \) deep.
3. 3 levels of N: \( N_1 = 40, N_2 = 80 \) and \( N_3 = 120 \) lb./ac.

3. DESIGN:
(i) 3^3 confounded factorial. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) 1/121 ac. (b) 1/200 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Below normal. (ii) Nil. (iii) Yield of potato. (iv) (a) 1951—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Raw data N.A.
5. RESULTS:

(i) 4.07 ton/ac.
(ii) 0.85 ton/ac.
(iii) None of effects is significant.
(iv) Av. yield of potato in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
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<td>F1</td>
<td>3.92</td>
<td>N1</td>
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<tr>
<td>I2</td>
<td>4.37</td>
<td>F2</td>
<td>4.12</td>
<td>N2</td>
<td>4.16</td>
</tr>
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<td>I3</td>
<td>4.01</td>
<td>F3</td>
<td>4.18</td>
<td>N3</td>
<td>4.12</td>
</tr>
</tbody>
</table>

S/E/mean = 0.20 ton/ac.

Crop: Carrot (Rahi). Ref: I.A.R.I. 52(63). Type: "CM".

Object: To study the effect of different methods of cultivation and fertilizer application on the yield of Carrots.

1. BASAL CONDITIONS:

(i) (a) No. (b) and (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3, 14. 10. 1952. (iv) (a) to (e) As under treatments. (v) B.D. of F.Y.M. at 120 md/ac. (vi) N.A. (vii) Irrigated.
(viii) weeding and thinning (ix) N.A. (x) 7, 9 to 22, 24.3.1953.

2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2)
(1) 3 ploughings: C1=9" to 10" deep ploughing by tractor, C2=5" deep by mould board plough and C3=5" deep by country plough.
(2) 2 methods of applying fertilizers: M1=Placement with plough sole and M2=Broadcast.
Sub-plot treatments:
(3) 3 fertilizer mixtures: 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.

Source of fertilizers N.A.

3. DESIGN:

(i) Split-plot. (ii) (a) 6 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 1/69 ac. (b) 1/79 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of carrot. (iv) (a) 1952-N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 21.88 ton/ac.
(ii) (a) 5.37 ton/ac.
(b) 4.70 ton/ac.
(iii) M effect alone is significant.
(iv) Av. yield of carrot in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th></th>
<th></th>
<th></th>
<th>Mean</th>
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<td>20.40</td>
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<td>21.18</td>
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<tr>
<td>M2</td>
<td>20.83</td>
<td>22.83</td>
<td>24.09</td>
<td></td>
<td></td>
<td></td>
<td>22.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
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<td>21.61</td>
<td>22.55</td>
<td></td>
<td></td>
<td></td>
<td>21.88</td>
<td></td>
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</tr>
<tr>
<td>N1</td>
<td>22.15</td>
<td>22.59</td>
<td>22.27</td>
<td></td>
<td></td>
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<tr>
<td>N2</td>
<td>23.92</td>
<td>21.43</td>
<td>22.80</td>
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<td>22.85</td>
<td>24.64</td>
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<tr>
<td>N3</td>
<td>18.35</td>
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<td>22.59</td>
<td></td>
<td></td>
<td></td>
<td>22.72</td>
<td>20.59</td>
<td></td>
</tr>
</tbody>
</table>
S.E. of difference of two
1. C marginal means  = 1.55 ton/ac.
2. M marginal means  = 1.27 ton/ac.
3. N marginal means  = 1.36 ton/ac.
4. N means at the same level of C  = 2.35 ton/ac.
5. C means at the same level of N  = 2.46 ton/ac.
6. N means at the same level of M  = 1.92 ton/ac.
7. M means at the same level of N  = 2.83 ton/ac.
S.E. of body of C×M table  = 1.55 ton/ac.

Crop: Carrot (Rabi). Ref: I.A.R.I. 53(60). Type: 'CM'.

Object —To study the effect of different methods of cultivation and fertilizer application on the yield of Carrots.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 15 and 16.10.1953. (iv) and (v) As per treatments. (vi) N.A. (vii) Irrigated. (viii) Gap-filling, thinning and weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   **Main-plot treatments:**
   All combinations of (1) and (2)
   (1) 3 ploughings: C \(_1\)=9' to 10'' deep ploughing by tractor, C \(_2\)=5' deep by mould board plough and C \(_3\)=5' deep by country plough.
   (2) 2 methods of applying fertilizers: M \(_1\)=Placement with plough sole and M \(_2\)=Broadcast.
   **Sub-plot treatments:**
   (3) 3 fertilizer mixtures: N \(_1\)=80 lb./ac. of N+80 lb./ac. of P\(_2\)O\(_5\)+40 lb./ac. of K\(_2\)O, N \(_2\)=120 lb./ac. of N+80 lb./ac. of P\(_2\)O\(_5\)+40 lb./ac. of K\(_2\)O and N \(_3\)=120 lb./ac. of N.

Source of fertilizers N.A.

3. DESIGN:
   (i) Split-plot. (ii) 6 main-plots/block and 3 sub-plots/main-plot. (iii) 4. (iv) 1/60 ac. (b) 1/70 ac. (v) Yes. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Yield of carrot. (iv) (a) N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 8.11 ton/ac.
   (ii) (a) 42.38 ton/ac.
   (b) 26.26 ton/ac.
   (iii) Interaction main-plot×sub-plot is highly significant.
   (iv) Av. yield of carrot in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>C(_1)</th>
<th>C(_2)</th>
<th>C(_3)</th>
<th>Mean</th>
<th>N(_1)</th>
<th>N(_2)</th>
<th>N(_3)</th>
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<td>7.00</td>
<td>5.69</td>
<td>7.11</td>
<td>6.60</td>
<td>6.84</td>
<td>6.69</td>
<td>6.27</td>
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<tr>
<td>M(_2)</td>
<td>11.31</td>
<td>9.31</td>
<td>8.29</td>
<td>9.64</td>
<td>10.55</td>
<td>9.26</td>
<td>9.10</td>
</tr>
<tr>
<td>Mean</td>
<td>9.16</td>
<td>7.50</td>
<td>7.70</td>
<td>8.12</td>
<td>8.69</td>
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<td>8.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N(_2)</td>
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<td>7.11</td>
<td>7.68</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>N(_3)</td>
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<td>7.09</td>
<td>7.38</td>
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</tbody>
</table>
Crop :- Sweet Potato (Kharij).  

Object :- To study the effect of different cultural practices on different varieties of Sweet Potato.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 4 to 7.7.1952.  (iv) (a) Ploughing with tractor and desi plough twice and making ridges.  (b) Ridge planting.  (c) to (e) N.A.  
   (v) F.Y.M. at 5 ton/ac.  (vi) As per treatments.  (vii) Irrigated.  (viii) Weeding and thinning.  (ix) 13.44".  
   (x) February, 1953.

2. TREATMENTS:
   Main-plot treatments :  
   2 methods of ploughing : \( P_1 \)= On flat and \( P_2 \)=On ridges.  
   Sub-plot treatments :  
   2 varieties : \( V_1 \)=T.S.T. white and \( V_2 \)=F.A. 17.  
   Sub-sub-plot treatments :  
   3 spacings between lines : \( S_1 =6 \), \( S_2 =9 \) and \( S_3 =12 \) inches.

3. DESIGN :
   (i) Split-plot.  (ii) (a) 2 main-plots/block ; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot.  (b) N.A.  
   (iii) 4.  (iv) (a) 28'X28'.  (b) 26'X26'.  (v) 1' on each side.  (vi) Yes.

4. GENERAL:
   (b) Yes.  (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1.05 ton/ac.  
   (ii) (a) 0.41 ton/ac.  
   (b) 0.76 ton/ac.  
   (c) 0.36 ton/ac.  
   (iii) V effect alone is highly significant.  
   (iv) A : yield potato in ton/ac.

<table>
<thead>
<tr>
<th>( P_1 )</th>
<th>( P_2 )</th>
<th>Mean</th>
<th>( V_1 )</th>
<th>( V_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>0.95</td>
<td>1.13</td>
<td>1.04</td>
<td>0.61</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>1.11</td>
<td>1.05</td>
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</tr>
<tr>
<td>( S_3 )</td>
<td>0.92</td>
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<td>1.03</td>
<td>0.52</td>
</tr>
<tr>
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<td>0.99</td>
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</tr>
<tr>
<td>( V_1 )</td>
<td>0.59</td>
<td>0.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( V_2 )</td>
<td>1.39</td>
<td>1.56</td>
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</tbody>
</table>
S.E. of difference of two
1. P marginal means = 0.12 ton/ac.
2. V marginal means = 0.22 ton/ac.
3. S marginal means = 0.13 ton/ac.
4. S means at the same level of P = 0.18 ton/ac.
5. P means at the same level of S = 0.19 ton/ac.
6. S means at the same level of V = 0.18 ton/ac.
7. V means at the same level of S = 0.26 ton/ac.
8. V means at the same level of P = 0.30 ton/ac.
9. P means at the same level of V = 0.16 ton/ac.

Crop: Sweet Potato (Kharif). Ref: I.A.R.I. 53(56), Type: ‘CV’:
Object: To study the effect of different cultural practices on different varieties of Sweet Potato.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.6.1953 to 22.6.1953. (iv) (a) Ploughing with victory plough, desi plough, tractor and levelling. (b) to (e) N.A. (v) F.Y.M. at 10 ton/ac and A/S at 20 lb./ac. of N. (vi) N.A. (vii) Irrigated. (viii) Weeding and hoeing. (x) 25.35°. (x) 17.12.1953 to 9.1.1954.

2. TREATMENTS:
   Main-plot treatments:
   - 2 methods of ploughing: P1 = On flat and P2 = On ridges.
   Sub-plot treatments:
   Sub-sub-plot treatments:
   - 3 spacings between lines: S1 = 6, S2 = 9 and S3 = 12 inches.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 2 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 30'x24'. (b) 28'x21'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Stem weevil-spraying of D.D.T. (iii) Yield of sweet potato. (iv) (a) 1952-1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2.14 ton/ac.
   (ii) (a) 0.67 ton/ac.
   (b) 1.19 ton/ac.
   (c) 0.81 ton/ac.
   (iii) V effect alone is highly significant.
   (iv) Av. yield of sweet potato in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>P1</th>
<th>P2</th>
<th>Mean</th>
<th>V1</th>
<th>V2</th>
</tr>
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<tbody>
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<td>1.80</td>
<td>2.31</td>
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<td>2.86</td>
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<td>2.28</td>
<td>2.15</td>
<td>2.22</td>
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<tr>
<td>S3</td>
<td>1.94</td>
<td>2.34</td>
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<td>1.33</td>
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<tr>
<td>V2</td>
<td>2.80</td>
<td>3.20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. P marginal means = 0.19 ton/ac.
2. V marginal means = 0.34 ton/ac.
3. S marginal means = 0.23 ton/ac.
4. S means at the same level of P = 0.33 ton/ac.
5. P means at the same level of S = 0.39 ton/ac.
6. S means at the same level of V = 0.33 ton/ac.
7. V means at the same level of S = 0.36 ton/ac.
8. V means at the same level of P = 0.48 ton/ac.
9. P means at the same level of V = 0.39 ton/ac.
1. **BASAL CONDITIONS** to 4. **GENERAL**.

Please refer to I.A.R.I. 52(27) on WHEAT.

5. **RESULTS**:

(i) 1576 lb./ac.
(ii) 297.9 lb./ac.
(iii) Treatments do not differ significantly.

(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1986</td>
</tr>
<tr>
<td>2.</td>
<td>1484</td>
</tr>
<tr>
<td>3.</td>
<td>1259</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>105.3 lb./ac.</td>
</tr>
</tbody>
</table>

---

**Crop**: Gram.  **Ref**: I.A.R.I. 53(32c).  **Type**: 'C'.

Object:—To study the effect of sowing premature and mature seeds on Gram yield.

1. **BASAL CONDITIONS** to 4. **GENERAL**.

Please refer to I.A.R.I. 53(32) on WHEAT.

5. **RESULTS**:

(i) 94 lb./ac.
(ii) 207.4 lb./ac.

(iii) Treatments differ highly significantly.

(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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</tr>
<tr>
<td>2.</td>
<td>941</td>
</tr>
<tr>
<td>3.</td>
<td>695</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>73.23 lb./ac.</td>
</tr>
</tbody>
</table>

---

**Crop**: Peas.  **Ref**: I.A.R.I. 53(16).  **Type**: 'M'.

Object:—To study the effect of inorganic and organic manures on the yield of crops in the rotation of cereals.

1. **BASAL CONDITIONS**:

(i) (a) Maize-Wheat-Maize-Peas. (b) Main. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.10.1953. (iv) (a) Dry victory plough and desi plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) N.A. (viii) Bakharbig on 27.11.1953, weeding on 5.1.1954 and weeding on 17.2.1954 to 18.2.1954. (ix) N.A. (x) 23.3.1954.

2. **TREATMENTS**:

1. Control.
2. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅.
3. A/S at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+K at 100 lb./ac. of K₂O.
4. F.Y.M. at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+K at 100 lb./ac. of K₂O.
5. Castor cake at 60 lb./ac. of N+Super at 100 lb./ac. of P₂O₅+100 lb./ac. of K₂O.

Organic manures (F.Y.M. and Castor cake) to be applied to maize in full dose and artificial manures half to maize and half to peas.

3. **DESIGN**:

(i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 36°×29°. (b) 36°×27°. (v) 1' around. (vi) Yes.
4. GENERAL:

(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1952—1955.  (b) Yes.  (c) N.A.  (v) (a), (b) No.  (iv) Nil.  (vii) Nil.

5. RESULTS:

(i) 1013 lb./ac.
(ii) 314.3 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>874</td>
</tr>
<tr>
<td>2.</td>
<td>1045</td>
</tr>
<tr>
<td>3.</td>
<td>1170</td>
</tr>
<tr>
<td>4.</td>
<td>946</td>
</tr>
<tr>
<td>5.</td>
<td>1029</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>±128.4 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Peas (Rabi).  Ref: I.A.R.I. 51(58).  Type: 'MV'.

Object:—To study the effect of placement of Super at different depths and at different levels on Pea varieties.

1. BASAL CONDITIONS:

(i) (a) N.A.  (b) N.A.  (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 17.10.1951.  (iv) (a) Palewa followed by desi plough twice.  (b) to (e) N.A.  (v) N.A.  (vi) As per treatments.  (vii) Irrigated.  (viii) Gap-filling was done on 1st week of Dec. 1951.  (ix) N.A.  (x) 1st and 2nd week of April, 1952.

2. TREATMENTS:

All combinations of (1), (2) and (3)

(I) 3 varieties: \( V_1 = N \) P. 29, \( V_2 = 
Phillipare \) smooth and \( V_3 = 
Delroyche \) comments.
(II) 3 levels of \( P_2O_5 \) as Super: \( P_0 = 0 \), \( P_1 = 40 \) and \( P_2 = 80 \) lb./ac.
(III) 3 depth or placement of Super: \( D_1 = 
Broadcast \), \( D_2 = 
Placed 2\text{"} below seed \) and \( D_3 = 
Placed 4\text{"} below seed. \\
Super placement was done along with sowing in \( P_0 \), \( P_1 \), \( P_2 \).

3. DESIGN:

(i) 3\(^3\) confounded factorial.  (ii) (a) 9 plots/block and 3 blocks/replication.  (b) N.A.  (iii) 2.  (iv) (a) 52'x14'’.  (b) 52'x10'.  (v) N.A.  (vi) Yes.

4. GENERAL:

(i) The crop was very heterogeneous.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1951—N.A.  (b) No.  (c) N.A.  (v) (a), (b) No.  (vi) Yes.  (vii) Nil.  (viii) Hail storm on 1st march 1953 damaged the crop considerably.  (vii) Raw data N.A.  Hence the two way tables could not be presented.

5. RESULTS:

(i) 498.4 lb./ac.
(ii) N.A.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>565.3</td>
</tr>
<tr>
<td>( V_2 )</td>
<td>469.0</td>
</tr>
<tr>
<td>( V_3 )</td>
<td>460.8</td>
</tr>
<tr>
<td>( D_1 )</td>
<td>548.0</td>
</tr>
<tr>
<td>( D_2 )</td>
<td>464.9</td>
</tr>
<tr>
<td>( D_3 )</td>
<td>482.2</td>
</tr>
<tr>
<td>( P_0 )</td>
<td>478.1</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>478.9</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>538.1</td>
</tr>
</tbody>
</table>
Crop :- Peas (Rabi).

Object:—To study the effect of different manures on crop yield with different rotations.

1. BASAL CONDITIONS:
   (i) (a) First year: Maize-Oats, Second year: Maize-Pea, Third year: Maize-Wheat and Fourth year Maize- Gram (8 course rotation). (b) Maize. (c) As per treatments. (ii) (a) Light loam. (b) N.A. (iii) 30.10.1953. (iv) (a) 4 desi ploughings. (b) Sown behind the plough. (c) 24 seers/ac. (d) Row to Row-1' apart. (e) Nil. (vi) N.P. 29 (medium). (vii) Unirrigated. (viii) Weeding. (ix) 2.17" (x) 23.2.1954.

2. TREATMENTS:
   1. Control.
   2. F.Y.M. at 8000 lb./ac.
   3. Rape cake at 40 lb./ac. of N.
   4. A/S at 40 lb./ac. of N.
   5. Pot. Sul. at 50 lb./ac. of K₂O.
   6. Super at 80 lb./ac. of P₂O₅.
   7. Treatment 4+Treatment 5.
   8. Treatment 4+Treatment 6.
   10. Treatment 4+Treatment 5+Treatment 6.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 10. (iv) (a) 4'x24'. (b) 42'x22'. (v) 1' around the plot. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1933-1961 (8th year of the expt.). (b) Yes. (c) Nil. (vi) (a) No. (b) Nil. (vii) The experiment was conducted at the Botanical Sub-station, Pusa (Bihar).

5. RESULTS:
   (i) 927.4 lb./ac.
   (ii) 85.49 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>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>699</td>
<td>6.</td>
<td>900</td>
</tr>
<tr>
<td>2.</td>
<td>1406</td>
<td>7.</td>
<td>727</td>
</tr>
<tr>
<td>3.</td>
<td>1083</td>
<td>8.</td>
<td>1011</td>
</tr>
<tr>
<td>4.</td>
<td>713</td>
<td>9.</td>
<td>882</td>
</tr>
<tr>
<td>5.</td>
<td>748</td>
<td>10-</td>
<td>995</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td>-27.04 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Peas (Rabi).

Object:—To study the effect of manures on the yield of Pea crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) As per treatments. (ii) (a) and (b) N.A. (iii) 21, 30.11.1953. (iv) (a) 1 ploughing with empire plough and one with desi plough. (b) Sown behind the plough. (c) 24 seers/ac. (d) N.A. (vii) The experiment was conducted at the Botanical Sub-station, Pusa (Bihar).

2. TREATMENTS:
   1. No manure.
   2. F.Y.M. 8000 lb./ac.
   3. Rape cake 40 lb./ac. of N.
   4. A/S 20 lb./ac. of N.
   5. Pot. Sul. 25 lb./ac. of K₂O.
   6. Super at 40 lb./ac. of P₂O₅.
   7. Treatment 4+Treatment 5.
   8. Treatment 4+Treatment 6.
   10. Treatment 4+Treatment 5+Treatment 6.

Application of F.Y.M. on 9th June, Rape cake on 9th June, fertilizers on 16th and again Rape cake on 23rd July 1953.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 10. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Satisfactory. (ii) Wilt in the plots where F.Y.M. was applied. (iii) Grain yield. (iv) (a) 1932-1953. (b) and (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) The experiment was conducted at the Botanical Sub-station, Pusa (Bihar).

5. RESULTS:
(i) 802 lb./ac.
(ii) 297.0 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>604</td>
<td>6.</td>
<td>857</td>
</tr>
<tr>
<td>2.</td>
<td>1217</td>
<td>7.</td>
<td>629</td>
</tr>
<tr>
<td>3.</td>
<td>937</td>
<td>8.</td>
<td>874</td>
</tr>
<tr>
<td>4.</td>
<td>634</td>
<td>9.</td>
<td>763</td>
</tr>
<tr>
<td>5.</td>
<td>647</td>
<td>10.</td>
<td>1046</td>
</tr>
</tbody>
</table>

S.E./mean = 60.9 lb./ac.

Crop: Peas (Rabi). Ref: I.A.R.I. 52 (27 a) Type: 'C'.

Object:—To study the effect of sowing premature and mature seeds on Peas yield.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 52 (27) on WHEAT.

5. RESULTS:
(i) 2142 lb./ac.
(ii) 309.5 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2681</td>
</tr>
<tr>
<td>2.</td>
<td>2456</td>
</tr>
<tr>
<td>3.</td>
<td>1289</td>
</tr>
</tbody>
</table>

S.E./mean = 109.4 lb./ac.

Crop: Peas Ref: I.A.R.I. 53(32a) Type: 'C'.

Object:—To study the effect of sowing premature and mature seeds on Peas yield.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 53(32) on WHEAT.

5. RESULTS:
(i) 948 lb./ac.
(ii) 216.4 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1165</td>
</tr>
<tr>
<td>2.</td>
<td>972</td>
</tr>
<tr>
<td>3.</td>
<td>706</td>
</tr>
</tbody>
</table>

S.E./mean = 76.5 lb./ac.
Crop: Cowpeas (Kharif), Ref: I.A.R.I. 56(63). Type: 'M'.

Object: To study the effect of phosphatic manuring of berseem and its residual effect on Cowpeas.

1. BASAL CONDITIONS:
   (i) (a) Berseem—Cowpeas—Berseem—Wheat after 3 years. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 23.7.1950. (iv) (a) 1 ploughing with victory plough and 2 ploughings with desi plough. (b) to (e) N.A. (v) N.A. (vi) and (vii) N.A. (viii) 3 hoeings with desi plough. (ix) N.A. (x) 4 to 9.10.1950.

2. TREATMENTS:
   1. F.Y.M. at 16 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   2. F.Y.M. at 32 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   3. F.Y.M. at 64 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   4. Super at 16 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   5. Super at 32 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   6. Super at 64 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   7. Super at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + F.Y.M. at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   8. Super at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + F.Y.M. at 24 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   9. Super at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + F.Y.M. at 56 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   10. F.Y.M. at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + Super at 24 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   11. F.Y.M. at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + Super at 56 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   12. F.Y.M. at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + Super at 16 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   13. F.Y.M. at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + Super at 56 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   14. No manure.
   15. Fallow in berseem season.

Treatments applied to previous crop berseem.

3. DESIGN:

4. GENERAL:
   (i) and (ii) N.A. (iii) Fodder yield. (iv) (a) 1948—1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) N.A. (vii) Replications 1 and II were comparatively more broadly than other replications.

5. RESULTS:
   (i) 4.30 ton/ac.
   (ii) 0.95 ton/ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3.99</td>
</tr>
<tr>
<td>2</td>
<td>4.67</td>
</tr>
<tr>
<td>3</td>
<td>4.59</td>
</tr>
<tr>
<td>4</td>
<td>4.07</td>
</tr>
<tr>
<td>5</td>
<td>4.09</td>
</tr>
<tr>
<td>6</td>
<td>4.96</td>
</tr>
<tr>
<td>7</td>
<td>3.59</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>0.39</td>
</tr>
</tbody>
</table>

Crop: Cowpeas (Kharif), Ref: I.A.R.I. 51(61). Type: 'M'.

Object: To study the effect of P on the yield of berseem and the residual effect on the yield of Cowpeas.

1. BASAL CONDITIONS:
   (i) (a) Berseem—Cowpeas—Berseem—Wheat after 3 years. (b) Berseem. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 6.7.1951, resowing on 31.7.1951. (iv) (a) 2 ploughings. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 21.10.1951, 28.10.1951 and 29.10.1951.

2. TREATMENTS:
   1. F.Y.M. at 16 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   2. F.Y.M. at 32 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   3. F.Y.M. at 64 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   4. Super at 16 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   5. Super at 32 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   6. Super at 64 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   7. Super at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + F.Y.M. at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   8. Super at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + F.Y.M. at 24 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   9. Super at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + F.Y.M. at 56 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   10. F.Y.M. at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + Super at 24 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   11. F.Y.M. at 8 lb./ac. of P<sub>2</sub>O<sub>5</sub> + Super at 56 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   12. No manure.
   13. Fallow in berseem season.

Treatments applied to previous crop berseem.

3. DESIGN:
   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 63' X 15'. (v) N.A. (vi) Yes.
4 GENERAL:
(i) Poor. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1948-1954. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) No rains, scarcity of water, dry and hot weather. (vii) Nil.

5. RESULTS:
(i) 1.62 ton/ac.
(ii) 0.97 ton/ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.33</td>
<td>8.</td>
<td>1.17</td>
</tr>
<tr>
<td>2.</td>
<td>1.80</td>
<td>9.</td>
<td>1.82</td>
</tr>
<tr>
<td>3.</td>
<td>1.42</td>
<td>10.</td>
<td>1.38</td>
</tr>
<tr>
<td>4.</td>
<td>1.22</td>
<td>11.</td>
<td>1.76</td>
</tr>
<tr>
<td>5.</td>
<td>2.46</td>
<td>12.</td>
<td>1.31</td>
</tr>
<tr>
<td>6.</td>
<td>1.53</td>
<td>13.</td>
<td>2.08</td>
</tr>
<tr>
<td>7.</td>
<td>1.62</td>
<td>S.E./mean</td>
<td>0.40 ton/ac.</td>
</tr>
</tbody>
</table>


Object: To study the effect of the yield of P on berseem and residual effect on Cowpeas yield.

1. BASAL CONDITIONS:
(i) (a) Berseem—Cowpeas (Wheat after 3 years). (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18.6.1952. (iv) (a) Preparing land with desi plough. After harvesting wheat, land ploughed twice and sowing done with third ploughing. (b) N.A. (c) 46 yrs/ac. (d) and (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) 29,30,8.1952.

2. TREATMENTS:
1. F.Y.M. at 16 lb/ac. of P2O5
2. F.Y.M. at 32 lb/ac. of P2O5
3. F.Y.M. at 64 lb/ac. of P2O5
4. Super at 16 lb/ac. of P2O5
5. Super at 32 lb/ac. of P2O5
6. Super at 64 lb/ac. of P2O5
7. Super at 8 lb/ac. of P2O5 + F.Y.M. at 8 lb/ac. of P2O5
8. Super at 8 lb/ac. of P2O5 + F.Y.M. at 24 lb/ac. of P2O5
9. Super at 8 lb/ac. of P2O5 + F.Y.M. at 56 lb/ac. of P2O5
10. P.Y.M at 8 lb/ac. of P2O5 + Super at 24 lb/ac. of P2O5
11. F.Y.M at 8 lb/ac. of P2O5 + Super at 56 lb/ac. of P2O5
12. No manure.
13. Fallow in berseem season.

Treatments applied to berseem.

3. DESIGN:
(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 63' x 15'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1948-54. (b) Yes. (c) N.A. (a) and (b) No (vi) and (vii) Nil.

5. RESULTS:
(i) 2.41 ton/ac.
(ii) 0.85 ton/ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2.21</td>
<td>8.</td>
<td>3.05</td>
</tr>
<tr>
<td>2.</td>
<td>1.80</td>
<td>9.</td>
<td>2.01</td>
</tr>
<tr>
<td>3.</td>
<td>2.29</td>
<td>10.</td>
<td>2.52</td>
</tr>
<tr>
<td>4.</td>
<td>2.30</td>
<td>11.</td>
<td>2.71</td>
</tr>
<tr>
<td>5.</td>
<td>2.58</td>
<td>12.</td>
<td>2.57</td>
</tr>
<tr>
<td>6.</td>
<td>2.88</td>
<td>13.</td>
<td>2.06</td>
</tr>
<tr>
<td>7.</td>
<td>2.06</td>
<td>S.E./mean</td>
<td>0.35 ton/ac.</td>
</tr>
</tbody>
</table>
Crop := Cowpeas (*Kharif*).  
Ref := I.A.R.I. 53(73).  
Type := 'M'.

Object := To study the effect of P$_2$O$_5$ on the yield of berseem and its residual effect on Cowpeas yield.

1. BASAL CONDITIONS:
   (i) (a) Berseem-Cowpeas-Berseem (Wheat after 3 years).  
   (b) Wheat.  
   (c) N.A.  
   (ii) (a) and (b) Refer item 11 on page 143.  
   (iii) 20 to 22.6.1953.  
   (iv) (a) 4 dry ploughing with victory plough and preparation of land.  
   (b) to (e) N.A.  
   (v) F.Y.M. at 4 dry.  
   (vi) N.A.  
   (vii) Irrigated.  
   (viii) 1 hoeing and 1 weeding.  
   (ix) N.A.  
   (x) 1.9.1953 to 3.9.1953.

2. TREATMENTS:
   1. F.Y.M. at 16 lb./ac. of P$_2$O$_5$.  
   2. F.Y.M. at 32 lb./ac. of P$_2$O$_5$.  
   3. F.Y.M. at 64 lb./ac. of P$_2$O$_5$.  
   4. Super at 16 lb./ac. of P$_2$O$_5$.  
   5. Super at 32 lb./ac. of P$_2$O$_5$.  
   6. Super at 64 lb./ac. of P$_2$O$_5$.  
   7. Super at 8 lb./ac. of P$_2$O$_5$.  
   8. Super at 8 lb./ac. of P$_2$O$_5$.  
   9. Super at 8 lb./ac. of P$_2$O$_5$.  
   10. F.Y.M. at 8 lb./ac. of P$_2$O$_5$.  
   11. F.Y.M. at 8 lb./ac. of P$_2$O$_5$.  
   12. No manure.  
   13. Fallow in berseem season.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 13.  
   (b) N.A.  
   (iii) 6.  
   (iv) (a) N.A.  
   (v) N.A.  
   (vi) Yes.

4. GENERAL:
   (i) N.A.  
   (ii) N.A.  
   (iii) Yield of green fodder.  
   (iv) (a) 1948—1954.  
   (b) Yes.  
   (c) N.A.  
   (v) (a) and (b) No.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 3.41 ton/ac.  
   (ii) 0.80 ton/ac.  
   (iii) Treatments do not differ significantly.  
   (iv) Av. yield of fodder in ton/ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2.85</td>
<td>8.</td>
<td>3.13</td>
</tr>
<tr>
<td>2.</td>
<td>3.83</td>
<td>9.</td>
<td>2.89</td>
</tr>
<tr>
<td>3.</td>
<td>3.21</td>
<td>10.</td>
<td>3.14</td>
</tr>
<tr>
<td>4.</td>
<td>4.31</td>
<td>11.</td>
<td>3.40</td>
</tr>
<tr>
<td>5.</td>
<td>3.17</td>
<td>12.</td>
<td>3.14</td>
</tr>
<tr>
<td>6.</td>
<td>3.69</td>
<td>13.</td>
<td>3.74</td>
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<tr>
<td>7.</td>
<td>3.88</td>
<td>S.E./mean</td>
<td>=0.33 ton/ac.</td>
</tr>
</tbody>
</table>

Crop := Cowpeas.  
Ref := I.A.R.I. 52(28 c).  
Type := 'C'.

Object := To study the effect of sowing premature and mature seed on Cowpeas yield.

1. BASAL CONDITIONS to 4. GENERAL:
   Please refer to No. I.A.R.I. 52(28) under MAIZE.

5. RESULTS:
   (i) 2009 lb./ac.  
   (ii) 20.16 lb./ac.  
   (iii) Treatments differ highly significantly.  
   (iv) Av. yield in lb./ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3165</td>
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<tr>
<td>2.</td>
<td>2955</td>
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<tr>
<td>3.</td>
<td>2706</td>
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<tr>
<td>S.E./mean</td>
<td>=8.23 lb./ac.</td>
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</table>
Crop: Cowpeas.  
Ref: I.A.R.I. 53(31) c.  
Type = ‘C’.  

Object: To study the effect of premature and mature seed on the yield of Cowpeas.

1. **BASAL CONDITIONS** to 4. **GENERAL**:

   Please refer to No. I.A.R.I. 53(31) under MAIZE.

5. **RESULTS**:

   (i) 422.1 lb./ac.  
   (ii) N.A.  
   (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>
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<tbody>
<tr>
<td>1.</td>
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</tr>
<tr>
<td>2.</td>
<td>464.9</td>
</tr>
<tr>
<td>3.</td>
<td>238.6</td>
</tr>
</tbody>
</table>

Crop: Sugarcane.  
Ref: I.A.R.I. 50(1).  
Type = ‘MV’.  

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

1. **BASAL CONDITIONS**:

   (i) (a) Nil. (b) and (c) N.A.  
   (ii) (a) and (b) Refer item 11 on page 143. (iii) 2nd week of March 1950.  
   (iv) (a) Tractor ploughing and tractor discing. (b) to (e) N.A.  
   (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Horse hoeing and weeding.  
   (ix) N.A. (x) End of April 1951.

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) 6 main-plots/block; 4 sub-plots/main-plot. (b) N.A.  
   (iii) 75’×18’. (b) 75’×12’. (v) N.A. (vi) Yes.

4. **GENERAL**:

   (i) Normal.  
   (ii) Top borers.  
   (iii) Yield of sugarcane.  
   (iv) 1950—N.A.  
   (v) N.A.  
   (vi) and (b) No.  
   (vii) Nil.

5. **RESULTS**:

   (i) 23.73 ton/ac.  
   (ii) (a) 7.27 ton/ac.  
   (b) 2.31 ton/ac.  
   (iii) V and N effects are highly significant while interaction is not significant.  
   (iv) Av. yield of sugarcane in ton/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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<td>25.81</td>
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<td>20.87</td>
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<td>21.15</td>
<td>25.87</td>
<td>25.06</td>
<td>21.52</td>
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<tr>
<td>N3</td>
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<td>27.08</td>
<td>24.69</td>
<td>22.82</td>
<td>26.77</td>
<td>26.09</td>
<td>25.09</td>
</tr>
</tbody>
</table>

Mean 20.95 25.32 23.75 22.13 24.85 25.16 23.73

S.E. of difference of two

2. N marginal means = 0.77 ton/ac.  
3. N means at the same level of V = 1.89 ton/ac.  
4. V means at the same level of N = 3.39 ton/ac.
Crop: Sugarcane.  
Ref: I.A.R.I. 58(1).  
Type: 'MV'.

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A.  (ii) (a) and (b) Refer item 11, on page 143. (iii) 10 to 12.3.1951. (iv) (a) Tractor ploughing, disc hoeing and grubbing. (b) to (e) N.A.  (v) (vi) As per treatments.  (vii) N.A.  (viii) Horrond on March 31.3.1951. (ix) N.A. (x) N.A.

2. TREATMENTS & 3. DESIGN:
   Please refer to No. I.A.R.I. 50(1) on page 300.

4. GENERAL:
   (i) Suffered from draught. Heterogenous growth.  (ii) N.A.  (iii) Yield of sugarcane.  (iv) (a) 1950 to N.A. (b) No. (c) N.A.  (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 9.34 ton/ac.
   (ii) (a) 2.08 ton/ac.  
   (b) 1.95 ton/ac.  
   (iii) Only V effect is highly significant.  
   (iv) Av. yield of cane in ton/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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<td>10.33</td>
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<td>8.01</td>
<td>10.21</td>
<td>6.23</td>
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<tr>
<td>N1</td>
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<td>9.89</td>
<td>9.10</td>
<td>10.10</td>
<td>8.92</td>
<td>4.83</td>
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<tr>
<td>N2</td>
<td>10.42</td>
<td>13.26</td>
<td>8.77</td>
<td>9.08</td>
<td>9.13</td>
<td>7.02</td>
</tr>
<tr>
<td>Mean</td>
<td>9.47</td>
<td>11.82</td>
<td>10.28</td>
<td>9.47</td>
<td>9.22</td>
<td>5.80</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 0.85 ton/ac.
2. N marginal means = 0.65 ton/ac.
3. N means at the same level of V = 1.59 ton/ac.
4. V means at the same level of N = 1.62 ton/ac.

Crop: Sugarcane.  
Ref: I.A.R.I. 52(2).  
Type: 'MV'.

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

1. BASAL CONDITIONS:
   (i) (a) No.  (b) N.A.  (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143. (iii) 16 to 18.3.1952. (iv) (a) Ploughing with desi plough and adjura.  (b) to (ec) N.A.  (v) Nil. (vi) As per treatments. (vii) N.A. (viii) Earthing up in July 1952. (ix) N.A. (x) N.A.

2. TREATMENTS & 3. DESIGN:
   Please refer to No. I.A.R.I. 50(1) on page 300.

4. GENERAL:
   (i) N.A. (ii) Pyrilla and top-borer.  (iii) Yield of sugarcane.  (iv) (a) 1950 to N.A. (b) Yes. (c) N.A.  (v) (a) and (b) No. (vi) & (vii) Nil.

5. RESULTS:
   (i) 13.10 ton/ac.  
   (ii) (a) 1.37 ton/ac.  
   (b) 3.87 ton/ac.  
   (iii) Only V effect is highly significant.
Crop: - Sugarcane.  Ref: - I.A.R.I. 53(2).  Type: - 'MV'.

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

1. BASAL CONDITIONS:
   (i) (a) No.  (b) N.A.  (c) N.A.  (ii) (a), (b) Refer item 31 on page 143.  (iii) 12, 13.2.1953.  (iv) (a) Tractor ploughing and discing.  (b) to (e) N.A.  (v) N.A.  (vi) As per treatments.  (vii) Irrigated.  (viii) Hoeing after 1st irrigation.  (ix) N.A.  (x) N.A.

2. TREATMENTS and 3. DESIGN:
   Please refer to No. I.A.R.I. 50(1) on page 300.

4. GENERAL:
   (i) N.A.  (ii) N.A.  (iii) Yield of sugarcane.  (iv) (a) 1950 to N.A.  (b) Yes.  (c) N.A.  (v) (a), (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 18.98 ton/ac.
   (ii) (a) 3.14 ton/ac.
   (b) 1.78 ton/ac.
   (iii) Only N effect is highly significant.
   (iv) Av. yield of sugarcane in ton/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>N1</td>
<td>18.92</td>
<td>21.57</td>
<td>17.19</td>
<td>20.54</td>
<td>18.96</td>
<td>22.17</td>
<td>19.89</td>
</tr>
<tr>
<td>N3</td>
<td>16.54</td>
<td>19.20</td>
<td>16.73</td>
<td>16.50</td>
<td>15.45</td>
<td>23.60</td>
<td>18.00</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = -1.28 ton/ac.
2. N marginal means = -0.59 ton/ac.
3. N means at the same level of V = 1.45 ton/ac.
4. V means at the same level of N = 1.79 ton/ac.

Object: To study the effect of different depths of cultivation and different doses of N and P on two varieties of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) No.  (b) N.A.  (c) N.A.  (ii) (a), (b) Refer item 11 on page 143.  (iii) 14 to 19.3.1950.  (iv) (a) As per treatments.  (b) to (e) N.A.  (v) 10 ton/ac. of P.Y.M.  (vi) As per treatments.  (vii) Horse hoeing & 10.5.1950 and weeding in May and June.  (ix) N.A.  (x) Last week of April, 1951.

2. TREATMENTS:
   Main-plot treatments:
   3 ploughings: C1= Drill ploughing 3'-4' deep, C2= Tractor ploughing 6' deep+discing+grubbing and C3= Tractor ploughing 10' deep+discing+grubbing.

   Sub-plot treatments:
   2 varieties: V1= CO. 312 and V2= CO. 453.

   Sub-sub-plot treatments:
   All combinations of (1 and 2)
   (1) 3 levels of N as A/S: N0 = 0, N1 = 40 and N2 = 80 lb./ac.
   (2) 2 levels of P2O5 as super: P0 = 0 and P1 = 80 lb./ac.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 3 main-plots/block; 2 sub-plots/main-plot and 6 sub-sub-plots/main-plot.  (b) N.A.
   (iii) 3.  (iv) (a) N.A.  (b) 62'X21'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Slightly heterogenous.  (ii) Top borer.  (iii) Yield of sugarcane.  (iv) (a) 1950 to N.A.  (b) Yes.  (c) N.A.  (v) N.A.  (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 22.78 ton/ac.
   (ii) (a) 8.57 ton/ac.
   (b) 8.84 ton/ac.
   (c) 3.78 ton/ac.
   (iii) N effect is highly significant.  P effect and interactions NPxC and NPxV are significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N0P0</th>
<th>N0P1</th>
<th>N1P0</th>
<th>N1P1</th>
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<th>Mean</th>
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<th>V2</th>
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<tbody>
<tr>
<td>C3</td>
<td>18.92</td>
<td>18.84</td>
<td>25.84</td>
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<td>V2</td>
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<td>23.60</td>
<td>26.16</td>
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<td></td>
</tr>
</tbody>
</table>

6.E. difference of two
1. C marginal means = 2.02 ton/ac.  6. NP means at the same level of C = 2.18 ton/ac.
2. V marginal means = 1.70 ton/ac.  7. C means at the same level of NP = 2.84 ton/ac.
3. NP marginal means = 1.26 ton/ac.  8. NP means at the same level of V = 1.78 ton/ac.
4. V means at the same level of C = 2.95 ton/ac.  9. V means at the same level of NP = 2.35 ton/ac.
5. C means at the same level of V = 2.90 ton/ac.
Crop : Sugarcane.  
Ref : I.A.R.I. 51(36).  
Type : 'CMV'.

Object : To study the effect of different depths of cultivation and different doses of N and P on two varieties of Sugarcane.

1. BASAL CONDITIONS :

(i) (a) Nil.  (b) N.A.  (c) N.A.  (ii) (a), (b) Refer item 11 on page 143.  (iii) 14 to 18.3.1951.  (iv) (a) As per treatments.  (b) to (e) N.A.  (v) 10 ton/ac. of F.Y.M.  (vi) As per treatments.  (vii) Irrigated.  (viii) Lever harrowing on 21.3.1951, hand hoeing on 19 to 23.5.1951, horse hoeing in June 1951 and earthing up from 3 to 6.7.1951.  (ix) N.A.  (x) June 1952.

2. TREATMENTS :

Main plot treatments:

3 ploughings: C₁ = Desi ploughing 3'-4' deep, C₂ = Tractor ploughing 6' deep + discing + grubbing and C₃ = Tractor ploughing 10' deep + discing + grubbing.

Sub-plot treatments:

2 varieties: V₁ = CO.312 and V₂ = CO.435.

Sub-sub-plot treatments:

All combinations of (1) and (2)

(1) 3 levels of N as A/S : N₀ = 0, N₁ = 80 and N₂ = 160 lb/ac.
(2) 2 levels of P₂'O as Super : P₀ = 0 and P₁ = 80 lb/ac.

3. DESIGN :

(i) Split-plot.  (ii) (a) 3 main-plots/block ; 2 sub-plots/main-plot and 6 sub-sub-plots/sub-plot.  (b) N.A.
(iii) 3 x 3.  (iv) (a) 51' x 27'.  (b) 45' x 21'.  (v) 3' on each side.  (vi) Yes.

4. GENERAL :

(i) Below normal.  (ii) Pyrilla. Top borer.  (iii) Yield of sugarcane.  (iv) (a) 1950 to N.A.  (b) Yes.
(c) N.A.  (v) (a', b') No.  (vi) and (vii) Nil.

3. RESULTS :

(i) 18.5 ton/ac.
(ii) (a) 4.67 ton/ac.
(b) 2.04 ton/ac.
(c) 2.32 ton/ac.

(iii) Levels of V and N differ highly significantly. Interaction V x C is significant. Levels of C not significant. Interaction V x NP is significant while C x NP is not significant.

(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀P₀</th>
<th>N₀P₁</th>
<th>N₁P₀</th>
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<td>18.89</td>
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</tbody>
</table>

S.E. of difference of two

1. C marginal means = 1.10 ton/ac.  6. NP means at the same level of C = 1.34 ton/ac.
2. V marginal means = 0.39 ton/ac.  7. C means at the same level of NP = 1.65 ton/ac.
3. NP marginal means = 0.77 ton/ac.  8. NP means at the same level of V = 1.09 ton/ac.
4. V means at the same level of C = 0.68 ton/ac.  9. V means at the same level of NP = 1.07 ton/ac.
5. C means at the same level of V = 1.20 ton/ac.
Crop: Sugarcane.  
Ref: I.A.R.I. 52(58)  
Type: "CMV".

Object: To study the effect of different depths of cultivation and different doses of N and P on two varieties of sugarcane.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A.  
   (ii) (a) and (b) Refer item 11 on page 143.  
   (iii) 11 to 15.3. 1952.  
   (iv) (a) As per treatments.  
   (b) to (e) N.A.  
   (v) Nil.  
   (vi) As per treatments.  
   (vii) N.A.  
   (viii) Horse hoeing in April and May, weeding and earthing up in July, 1952.  
   (ix) N.A.  
   (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   - 3 ploughings:
     C1 = Desi ploughing 3"-4" depth,  
     C2 = Tractor ploughing 6"+discing+grubbing  
     C3 = Tractor ploughing 10"+discing+grubbing.
   Sub-plot treatments:
   - 2 varieties: V1 = CO 312 and V2 = CO 453.
   Sub-sub-plot treatments:
   - All combinations of (1) and (2).
   - (1) 3 levels of N as A/S: N0 = 0, N1 = 40 and N2 = 80 lb/ac.
   - (2) 2 levels of P2O5 as Super: P0 = 0 and P1 = 80 lb/ac.

3. DESIGN:
   (i) Split plot.  
   (ii) 3 main-plots/block, 2 sub-plots/main-plot and 6 sub-sub-plots/sub-plot.  
   (b) N.A.  
   (iii) 3.  
   (iv) (a) N.A.  
   (b) 1/50.  
   (c) N.A.  
   (v) N.A.  
   (vi) Yes.

4. GENERAL:
   (i) Suffered from draught.  
   (ii) Pyrilla effect.  
   (iii) Yield of sugarcane.  
   (iv) (a) 1950 to N.A.  
   (b) Yes.  
   (c) N.A.  
   (v) (a) and (b) No.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 22.96 ton/ac.
   (ii) (a) 1.18 ton/ac.
   (b) 1.57 ton/ac.
   (c) 2.14 ton/ac.
   (iii) Effects due to C, NP and interaction V×C are significant, V effect is highly significant while other effects are not significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N0P0</th>
<th>N0P1</th>
<th>N1P0</th>
<th>N1P1</th>
<th>N2P0</th>
<th>N2P1</th>
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<th>V2</th>
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<td>19.00</td>
<td>18.65</td>
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<tr>
<td>C3</td>
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<td>22.74</td>
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<tr>
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<td>20.79</td>
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<td>23.72</td>
<td>23.78</td>
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<td>24.47</td>
<td>22.96</td>
<td>27.74</td>
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<tr>
<td>V1</td>
<td>24.46</td>
<td>26.71</td>
<td>28.86</td>
<td>28.80</td>
<td>27.71</td>
<td>29.91</td>
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<td></td>
<td></td>
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<tr>
<td>V2</td>
<td>17.11</td>
<td>16.28</td>
<td>18.59</td>
<td>18.76</td>
<td>19.28</td>
<td>19.03</td>
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<td></td>
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</table>

S.E. of difference of two

1. C marginal means = 0.28 ton/ac.  
2. V marginal means = 0.50 ton/ac.  
3. NP marginal means = 0.71 ton/ac.  
4. V means at the same level of C = 0.52 ton/ac.  
5. C means at the same level of V = 0.46 ton/ac.  
6. NP means at the same level of C = 1.24 ton/ac.  
7. C means at the same level of NP = 1.16 ton/ac.  
8. NP means at the same level of V = 1.09 ton/ac.  
9. V means at the same level of NP = 0.95 ton/ac.
Crop :- Sugarcane.  Ref :- I.A.R.I. 52(31).  Type :- 'DM'.

Object :- To study the relative efficiency of some weedicides along with nitrogenous fertilizers on the weed control and correlated yield on sugarcane.

1. BASAL CONDITIONS :
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 15, 16, 17 February, 1953. (iv) (a) Victory ploughing, desi ploughing and deshi ploughing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 25 to 29 April, 1953.

2. TREATMENTS :
   All combinations of (1), (2) and (3).
   (1) 3 sources of N : S₁ = A/S, S₂ = C/N and S₃ = Cal. Nitrate.
   (2) 3 levels of N : N₁ = 40, N₂ = 80 and N₃ = 120 Ib/ac.
   (3) 3 weedicides : W₀ = 0, W₁ = Distox at 0.5 lb/ac. and W₂ = Cobalt Sulphate at 15 lb/ac.

3. DESIGN:
   (i) 3³ Fact. confounded. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 50' x 17.5'. (b) 50' x 12.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Slightly poor in southern field. (ii) Top borer infected the crop. (iii) Sugarcane yield. (iv) (a) 1952 to 1954. (b) Yes. (c) N.A. (v) No. (vi) Nil. (vii) Raw data N.A.

5. RESULTS:
   (i) 17.60 ton/ac.
   (ii) 3.85 ton/ac.
   (iii) Only N effect is highly significant.

Crop :- Sugarcane.  Ref :- I.A.R.I. 53(37).  Type :- 'DM'.

Object :- To study the relative efficiency of some weedicides along with nitrogenous fertilizers on the weed control and correlated yield on Sugarcane.

1. BASAL CONDITIONS :
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3rd week of February, 1953. (iv) (a) Victory ploughing, desi ploughing and deshi ploughing. (b) to (e) N.A. (v) Nil. (vi) CO. 312. (vii) N.A. (viii) One earthing up. (ix) and (x) N.A.

2. TREATMENTS :
   All combinations of (1), (2) and (3).
   (1) 3 sources of N : S₁ = A/S, S₂ = C/N and S₃ = Cal. Nitrate.
   (2) 3 levels of N : N₁ = 40, N₂ = 80 and N₃ = 120 lb/ac.
   (3) 3 weedicides : W₀ = 0, W₁ = Distox at 0.5 lb/ac. and W₂ = Cobalt Sulphate at 15 lb/ac.

3. DESIGN:
   (i) 3³ Fact. confounded. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 60' x 17.5'. (b) 60' x 12.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Slightly poor in southern field. (ii) Top borer infected the crop. (iii) Sugarcane yield. (iv) (a) 1952 to 1954. (b) Yes. (c) N.A. (v) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 17.51 ton/ac.
   (ii) 3.85 ton/ac.
   (iii) Only N effect is highly significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
<th>W₀</th>
<th>W₁</th>
<th>W₂</th>
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<td>20.43</td>
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<td>17.31</td>
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<td>16.10</td>
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<td>17.70</td>
<td>16.74</td>
<td>19.20</td>
<td>17.15</td>
</tr>
<tr>
<td>Mean</td>
<td>16.03</td>
<td>15.86</td>
<td>20.64</td>
<td>17.51</td>
<td>17.26</td>
<td>18.21</td>
<td>17.07</td>
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</tbody>
</table>

S.E. of any marginal mean = 0.91 ton/ac.
S.E. of body of any table = 1.57 ton/ac.

---

Crop :- Cotton.  
Ref :- I.A.R.I. 50(7).  
Type :- 'M'.

Object :- To find out the residual effect of combinations of N, P and K, applied to berseem on succeeding Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) Berseem—Maize—Berseem—Cotton—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.6.1950. (iv) (a) One ploughing with victory plough and two ploughings with desi plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 4 horse hoeings, 1 thinning and 1 weeding. (ix) N.A. (x) 1st picking on 12, 19.10.1950 and 2nd picking on 20, 23.11.1950.

2. TREATMENTS:
   1. Control (no manure).  
   2. P₂O₅ at 120 lb./ac.  
   3. P₂O₅ at 120 lb./ac. + K₄O at 120 lb./ac.  
   4. N at 100 lb./ac. + P₂O₅ at 120 lb./ac.  
   5. N at 25 lb./ac. + P₂O₅ at 120 lb./ac.  
   6. N at 50 lb./ac. + P₂O₅ at 120 lb./ac.  
   7. N at 100 lb./ac. + P₂O₅ at 120 lb./ac. + K₄O at 120 lb./ac.  
   8. Fallow.

Manures applied to previous berseem crop.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×18'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Kapas yield. (iv) (a) 1948—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1295 lb./ac.  
   (ii) 48.55 lb./ac.  
   (iii) Treatments do not differ significantly.  
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>1242</td>
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<td>3.</td>
<td>1236</td>
</tr>
<tr>
<td>4.</td>
<td>1391</td>
</tr>
</tbody>
</table>

S.E./mean = 19.82 lb./ac.
Crop : Cotton.  
Ref : I.A.R.I. 52(6).  
Type : 'M'.

Object :—To study the residual effect of combinations of N, P and K, applied to berseem crop, on succeeding Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Berseem-Cotton.  (b) Berseem.  (c) As per treatments.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 7.5.1953.  (iv) (a) 1 ploughing with victory plough and 1 with desi plough.  (b) to (e) N.A.  (v) Nil.  (vi) N.A.  (vii) Irrigated.  (viii) 2 bullock hoeings and 2 thinnings.  (ix) N.A.  (a) 1st picking 14 to 20.10.1952.  2nd picking 9 to 16.11.1952.

2. TREATMENTS:
   1. Control (no manure).
   2. P<sub>2</sub>O<sub>5</sub> at 120 lb./ac.
   3. P<sub>2</sub>O<sub>5</sub> at 120 lb./ac. + K<sub>2</sub>O at 120 lb./ac.
   4. N at 100 lb./ac. + P<sub>2</sub>O<sub>5</sub> at 120 lb./ac.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 8.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 36' x 18'.  (v) N.A.  (vi) F-216.  (vii) N.A.  (viii) N.A.  (ix) N.A.

4. GENERAL:
   (i) N.A.  (ii) Mild attack of jassid and white fly on 26.7.1953.  (iii) Yield of kapas.  (iv) (a) 1948-1953 N.A.  (b) Yes.  (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) NIL.

RESULTS:
   (i) 1571 lb./ac.
   (ii) 118.5 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1319</td>
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<tr>
<td>2.</td>
<td>1579</td>
</tr>
<tr>
<td>3.</td>
<td>1601</td>
</tr>
<tr>
<td>4.</td>
<td>1099</td>
</tr>
</tbody>
</table>

S.E./mean = 48.4 lb./ac.

Crop : Cotton.  
Type : 'M'.

Object :—To study the residual effect of combinations of N, P and K, applied to berseem crop, on succeeding Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) Cotton-Berseem-Maize.  (b) Berseem.  (c) As per treatments.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) N.A.  (iv) (a) to (e) N.A.  (v) N.A.  (vi) F-216.  (vii) N.A.  (viii) N.A.  (ix) N.A.  (x) N.A.

2. TREATMENTS:
   1. Control (no manure).
   2. P<sub>2</sub>O<sub>5</sub> at 120 lb./ac.
   3. P<sub>2</sub>O<sub>5</sub> at 120 lb./ac. + K<sub>2</sub>O at 120 lb./ac.
   4. N at 100 lb./ac. + P<sub>2</sub>O<sub>5</sub> at 120 lb./ac.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 8.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 36' x 18'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) N.A.  (ii) N.A.  (iii) Yield of kapas.  (iv) (a) 1948-1953.  (b) Yes.  (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) NIL.
5. RESULTS:

(i) 1288 lb/ac.
(ii) 89.69 lb/ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of "kapas" in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
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<tbody>
<tr>
<td>1.</td>
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<tr>
<td>2.</td>
<td>1345</td>
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<tr>
<td>3.</td>
<td>1383</td>
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<tr>
<td>4.</td>
<td>1317</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=36.62 lb/ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton.
Ref :- I.A.R.I. 52(39).
Type :- 'MV'.

Object :- To study the performance of different varieties of Cotton under local conditions and their response to nitrogenous manuring.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3 May, 1952. (iv) (a) Three ploughings. (b) to (c) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 4 weedings, 1 thinning and 1 gap filling. (ix) N.A. (x) 2nd week of November, 1952 and last week of December, 1952.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   2 doses of N: N0 = No manure and N1 = 20 lb/ac. of N as C/N and 20 lb/ac. of N as A/S.
   Manures applied on 11.7.1952 and 3.9.1952.

3. DESIGN:
   (i) Split-plot. (ii) (a) 8 main-plots/replication and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 33'x25'. (b) 31'x23'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Red leaf disease more in N0 plots than in N1 plots. Pink boll worm affected all the plots uniformly. (iii) "Kapas" yield. (iv) (a) 1952—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1578 lb/ac.
   (ii) (a) 109.4 lb/ac.
   (b) 79.5 lb/ac.
   (iii) Main effects of V and N are highly significant while their interaction is significant.
   (iv) Av. yield of "kapas" 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>V7</th>
<th>V8</th>
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<td>1511</td>
<td>1599</td>
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</tbody>
</table>

S.E. of difference of two
1. V marginal means = 54.7 lb/ac.
2. N marginal means = 19.9 lb/ac.
3. N means at the same level of V = 56.2 lb/ac.
4. V means at the same level of N = 67.6 lb/ac.
Crop => Cotton.  Ref => I.A.R.I. 51(10).  Type => 'CV'.

Object => To find out the effect of different spacings and dates of sowing on different varieties of Cotton.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Berseem. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) As per treatments. (iv) (a) Twice grubbed and once disced. (b) to (e) N.A. (v) G.N.C. A/S. Linseed cake, Castor cake and chillies cake: dose N.A. Berseem buried in March, 1951. (vi) American cotton. (vii) Irrigated. (viii) 2 intercultures, 2 weedings, 2 hoeings and 1 thinning. (ix) 9.5'. (x) Picking on 12, 18-10.1951 to 23.11.1951 and 28.11.1951 to 13.12.1951.

2. TREATMENTS:
   Main-plot treatments:
   4 dates of sowing: D1 = 24.4.1951, D2 = 14.5.1951, D3 = 25.5.1951 and D4 = 10.6.1951.
   Sub-plot treatments:
   4 varieties: V1 = M-4, V2 = F-216, V3 = F-320 and V4 = L. SS.
   Sub-sub-plot treatments:
   3 spacings: S1 = 3', S2 = 2.5' and S3 = 2'.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/blocks, 4 sub-plots/main-plot and 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 23.5' x 37.5'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Sowing was affected due to locust. Red leaf blight severe in V1 and V3. (iii) Kapas yield. (iv) (a) 1950-1953. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1258 lb./ac.
   (ii) (a) 320.0 lb./ac.
   (b) 249.0 lb./ac.
   (c) 166.9 lb./ac.
   (iii) Main effect of D is highly significant. V and D x V are significant. Others are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Mean</th>
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<th>S2</th>
<th>S3</th>
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</table>

S.E. of difference of two
1. D marginal means = 65.3 lb./ac.  6. S means at the same level of D => 59.0 lb./ac.
2. V marginal means = 50.8 lb./ac.  7. D means at the same level of S => 81.2 lb./ac.
3. S marginal means = 29.5 lb./ac.  8. S means at the same level of V => 59.0 lb./ac.
4. V means at the same level of D => 101.7 lb./ac.  9. V means at the same level of S => 70.0 lb./ac.
5. D means at the same level of V => 109.6 lb./ac.
Crop: Cotton.  
Ref: L.A.R.I. 52(17).  
Type: 'CV'.

Object: To find out a suitable variety for Delhi tract with optimum time of sowing and spacing in between lines.

1. BASAL CONDITIONS:
(i) (a) No.  (b) and (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 25th April, 10th May, 25th May and 10th June.  (iv) (a) 1 ploughing by victory plough, double discing by tractor, grubbing and levelling by karha.  (b) to (e) N.A.  (v) Berseem ploughed in as G.M.  (vi) American Cotton.  (vii) Irrigated.  (viii) 7 hoeing and 3 weedings.  (ix) 24.24'.  (x) Picking from middle of Oct. to first week of January.

2. TREATMENTS:
Main-plot treatments:  
4 dates of sowing :  
D1 = 25.4.1952, D2 = 10.5.1952, D3 = 25.5.1952 and D4 = 10.6.1952.

Sub-plot treatments:
4 varieties:  
V1 = M-4, V2 = F-216, V3 = F-320 and V4 = LSS.

Sub-sub-plot treatments:
3 spacings line to line:  
S1 = 3', S2 = 2.5' and S3 = 2'.

3. DESIGN:
(i) Split-plot.  (ii) (a) 4 main-plots/block ; 4 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot.  (b) N.A.  (iii) 4.  (iv) (a) 23.5' x 37.5' (b) 1/60. ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Normal. No lodging.  (ii) No.  (iii) Yield of kapas.  (iv) (a) 1950—N.A.  (b) No.  (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1062 lb./ac.
(ii) (a) 366.7 lb./ac.  
(b) 251.4 lb./ac.
(c) 109.3 lb./ac.

(iii) Main effects of D, V and S are highly significant.  Others are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>D3</th>
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S.E. of difference of two
1. D marginal means = 75.3 lb./ac.  
2. V marginal means = 51.3 lb./ac.  
3. S marginal means = 19.3 lb./ac.  
4. V means at the same level of D = 102.7 lb./ac.  
5. D means at the same level of V = 116.5 lb./ac.  
6. S means at the same level of D = 38.6 lb./ac.  
7. D means at the same level of S = 81.6 lb./ac.  
8. S means at the same level of V = 38.6 lb./ac.  
9. V means at the same level of S = 60.3 lb./ac.
Crop : Cotton.  
Type : 'CV'.

Object:—To find out a suitable variety for Delhi tract with optimum time of sowing and spacing in between lines.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.4.1953, 18.5.1953 and 10.6.1953. (iv) (a) Ploughing twice with desi plough preparing land with desi plough after soaking twice and beaming. (b) to (e) N.A. (v) G.N.C. at 213 lb./ac. applied on 30/31. 7.1953. (vi) American cotton. (vii) Irrigated. (viii) 3 weedings, 3 thinnings and 3 hoeings. (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3).
   (1) 3 dates of sowing: D1 = 25.4.1953, D2 = 18.5.1953 and D3 = 10.6.1953.
   (2) 3 varieties: V1 = F-216, V2 = F-320 and V3 = M-4.
   (3) 3 spacings: S1 = 1', S2 = 2' and S3 = 2'.

3. DESIGN:
   (i) 3 x 3 Fact. in R.B.D. (ii) 27 (b) N.A. (iii) 4. (iv) (a) N.A. (b) 30’ x 24’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Yield of kapas. (iv) (a) 1950—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1629 lb./ac.
   (ii) 617.1 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
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<th>D1</th>
<th>D2</th>
<th>D3</th>
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<th>V2</th>
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</tbody>
</table>

S.E. of any marginal means = 102.8 lb./ac.
S.E. of body of any table = 178.1 lb./ac.

---

Crop : Cotton. 
Ref : I.A.R.I. 52 (49).  
Type : 'CM'.

Object :—To study the effect of depths of ploughing and method of application of fertilizers.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A., (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 18, 19.5.1952. (iv) (a) As per treatments. (b) to (e) N.A. (v) N.A. (vi) F-216. (vii) Irrigated. (viii) 1 weeding by kharg, 2 hoeings with bullock hoe and 1 thinning. (ix) N.A. (x) 3 pickings from 22.9.1952 to 4.12.1952.
2. TREATMENTS:

Main-plot treatments:
- 3 depths of ploughing: A1 = 9" to 10" deep ploughing by tractor followed by grubbing, A2 = 5" to 6" deep ploughing by bullock, A3 = 4" to 5" deep ploughing by country plough.

Sub-plot treatments:
- 2 methods of application: B1 = Broadcast and B2 = Placement.

Sub-sub-plot treatments:
- 4 manures: M1 = A/S at 40 lb/ac of N, M2 = G.N.C. at 40 lb/ac of N, M3 = A/S at 40 lb/ac of N + Selecto Phos. at 80 lb/ac of P2O5, and M4 = G.N.C. at 40 lb/ac + Agro. Phos. at 80 lb/ac of P2O5.

Manures applied on 18, 19.5.1952.

3. DESIGN:

(i) Split-plot. (ii) 3 main-plots/block; 2 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 30' x 21' (b) 17' x 18'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Very minor attack of jassids and pink ball worm. (iii) Yield of klapas, (iv) (a) 1952-1954. (b) No. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 1555 lb/ac. (ii) (a) 297.0 lb/ac. (b) 197.5 lb/ac. (c) 142.4 lb/ac. (iii) Main effects of A and M are highly significant and main effect of B is significant. Others are not significant. (iv) Av. yield of klapas in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
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<th>B2</th>
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<td>1677</td>
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<td></td>
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</table>

S.E. of difference of two
1. A marginal means = 66.3 lb/ac. 6. M means at the same level of A = 63.7 lb/ac.
2. B marginal means = 35.5 lb/ac. 7. A means at the same level of M = 80.4 lb/ac.
3. M marginal means = 36.8 lb/ac. 8. M means at the same level of B = 52.0 lb/ac.
4. B means at the same level of A = 62.7 lb/ac. 9. B means at the same level of M = 57.9 lb/ac.
5. A means at the same level of B = 82.7 lb/ac.

Crop: Cotton. Ref: I.A.R.I. SS(50). Type: 'CM'.

Object: To study the effect of depth of ploughing and method of application of fertilizers.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 14 to 17.5.1953. (iv) (a) As per treatments. (b) 1 to (e) N.A. (v) N.A. (vi) F-216. (vii) Irrigated. (viii) 3 hoeings and 3 weedings with kharpi. (ix) N.A. (x) Picking from 28.9.1953 to 4.10.1953.
2. TREATMENTS:

Main-plot treatments:
3 depths of ploughing: $A_1 =$ Tractor ploughing 9"–10" deep followed by grubbing. $A_2 =$ Bullock victory plough 5"–6" deep followed by country plough and $A_3 =$ 4"–5" deep country plough.

Sub-plot treatments:
2 methods of application of manure: $B_1 =$ Broadcast and $B_2 =$ Placement.

Sub-sub-plot treatments:
4 measures: $M_1 =$ A/S at 40 lb./ac. of N, $M_2 =$ G.N.C. at 40 lb./ac. of N, $M_3 =$ A/S 40 lb./ac. of N+Super at 80 lb./ac. of $P_2O_5$, and $M_4 =$ G.N.C. at 40 lb./ac. of N+Super at 80 lb./ac. of $P_2O_5$.

Manures applied at the time of sowing.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication, 2 sub-plots/main-plot and 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 5. (iv) (a) 30'x21'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Yield of kapas. (iv) (a) 1952–1954. (b) No. (c) N.A. (v) (a), (b) No. (vi) Nil. (vii) Nil.

5. RESULTS:
(i) 1384 lb./ac.
(ii) (a) 378.5 lb./ac.
(b) 180.0 lb./ac.
(c) 99.6 lb./ac.

(iii) Main effect of B alone is highly significant.

(iv) Av. yield of kapas in lb./ac.

<table>
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<th></th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
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</table>

S.E. of difference of two
1. A marginal means $= 84.7$ lb./ac. 6. M means at the same level of A $= 44.5$ lb./ac.
2. B marginal means $= 33.9$ lb./ac. 7. A means at the same level of M $= 93.0$ lb./ac.
3. M marginal means $= 25.7$ lb./ac. 8. M means at the same level of B $= 56.4$ lb./ac.
4. B means at the same level of A $= 58.9$ lb./ac. 9. B means at the same level of M $= 46.3$ lb./ac.
5. A means at the same level of B $= 94.3$ lb./ac.

Crop :- Tobacco.  
Ref :- I.A.R.I. 53(44).  
Type :- 'M'.

Object :- To study the effect of different levels of N, P and K on Tobacco.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 12, 13, 2.1953. (iv) (a) 1 ploughing with victory plough and 2 with desi plough. (b) and (c) N.A. (d) 2' between rows and 2' between plants (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 4.6.1953 to 7.6.1953.
2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of \(N\): \(N_0=0\), \(N_1=40\) and \(N_2=80\) lb./ac.
(2) 3 levels of \(P_2O_5\): \(P_0=0\), \(P_1=40\) and \(P_2=80\) lb./ac.
(3) 3 levels of \(K_2O\): \(K_0=0\), \(K_1=40\) and \(K_2=80\) lb./ac.

3. DESIGN:
(i) 3\(^2\) Factorial confounded. (ii) (a) 9. (b) N.A. (iii) 2. (iv) (a) \(46^\prime \times 17\prime\); (b) \(42^\prime \times 12\prime\). (v) N.A. (vi) Yes.

4. GENERAL:
(i) The growth was normal. (ii) 1 to 2% plants affected by stem-rot. (iii) Yield of tobacco leaf. (iv) (a) 1952—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1216 lb./ac.
(ii) 156.5 lb./ac.
(iii) Levels of \(N\) alone differ significantly.
(iv) Av. yield of tobacco leaf in lb./ac.

<table>
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<th>(N_0)</th>
<th>(N_1)</th>
<th>(N_2)</th>
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S.E. of any marginal mean =45.2 lb./ac.
S.E. of body of any table =78.3 lb./ac.

Crop: Tobacco. Ref: I.A.R.I. 51(8b). Type: 'M'.

Object: To determine the nutritional requirements of Indian soils.

1. BASAL CONDITIONS to 4. GENERAL.
   Please refer to No. I.A.R.I. 51(8) under OATS.

5. RESULTS:
(i) 556.2 lb./ac.
(ii) 66.65 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of tobacco leaf in lb./ac.

<table>
<thead>
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<th>Treatment</th>
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<tr>
<td>3.</td>
<td>1192</td>
<td>7.</td>
<td>1067</td>
</tr>
<tr>
<td>4.</td>
<td>1115</td>
<td>8.</td>
<td>1097</td>
</tr>
</tbody>
</table>
S.E./mean =33.33 lb./ac.
Crop: Jute (Kharif).  
Ref: I.A.R.I. 52(68).  
Type: 'CV'.

Object: To find out the higher yielding variety when sown at different times.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) As per treatments.  (iv) (a) Victory plough once and desi plough thrice.  (b) to (e) N.A.  (v) Nil.  (vi) As per treatments.  (vii) Irrigated.  (viii) Weeding.  (ix) N.A.  (x) 14.8.1952, 2.9.1952, 19.9.1952 and 6.10.1952.

2. TREATMENTS:
   Main-plot treatments:
   4 dates of sowing: \( D_1 = 25.3.1952, D_2 = 15.4.1952, D_3 = 5.5.1952 \) and \( D_4 = 20.5.1952 \).

   Sub-plot treatments:
   2 varieties: \( V_1 = D-154 \) and \( V_2 = O-40 \).

3. DESIGN:
   (i) Split-plot.  (ii) (a) 4 main-plots/repetition and 2 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 16'x16'.  (b) 15'x15'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A.  (iii) Yield of fibre and seed.  (iv) (a) 1951—1953.  (b) No.  (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1742 lb./ac.
   (ii) (a) 364.8 lb./ac.
   (b) 519.3 lb./ac.
   (iii) Only \( V \) effect is highly significant.
   (iv) Av. yield of jute fibre in lb./ac.

   \[
   \begin{array}{cccc|c}
   \text{D_1} & \text{D_2} & \text{D_3} & \text{D_4} & \text{Mean} \\
   \hline
   V_1 & 1036 & 989 & 1642 & 1425 & 1278 \\
   V_2 & 2178 & 2129 & 2313 & 2204 & 2206 \\
   \hline
   \text{Mean} & 1617 & 1559 & 1977 & 1814 & 1742
   \end{array}
   \]

   S.E. of difference of two
   1. D marginal means = 182.4 lb./ac.
   2. V marginal means = 196.2 lb./ac.
   3. V means at the same level of D = 388.4 lb./ac.
   4. D means at the same level of V = 329.7 lb./ac.

Crop: Jute (Kharif).  
Ref: I.A.R.I. 58(55).  
Type: 'CV'.

Object: To find out the higher yielding variety when sown at different times.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) As per treatments.  (iv) (a) Victory plough once and desi plough thrice.  (b) to (e) N.A.  (v) Nil.  (vi) N.A.  (vii) Irrigated.  (viii) Weeding.  (ix) N.A.  (x) 11.8.1953, 28.8.1953, 18.9.1953 and 8.10.1953.

2. TREATMENTS:
   Main-plot treatments:
   4 dates of sowing: \( D_1 = 25.3.1953, D_2 = 15.4.1953, D_3 = 5.5.1953 \) and \( D_4 = 20.5.1953 \).

   Sub-plot treatments:
   2 varieties: \( V_1 = D-154 \) and \( V_2 = O-40 \).

3. DESIGN:
   (i) Split-plot.  (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 16'x16'.  (b) 15'x15'.  (v) N.A.  (vi) Yes.
4. GENERAL:
(i) and (ii) N.A. (ii) Yield of jute fibre. (iv) (a) 1958 to 1953. (b) No. (c) N.A. (v) (a) and (b) No. (v) and (vi) Nil.

5. RESULTS:
(i) 769 lb./ac.
(ii) (a) 335.7 lb./ac.
(b) 204.1 lb./ac.
(iii) Main effects of D and V are significant. Interaction is not significant.
(iv) Av. yield of jute fibre in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>757</td>
<td>699</td>
<td>658</td>
<td>362</td>
<td>619</td>
</tr>
<tr>
<td>V2</td>
<td>1029</td>
<td>1259</td>
<td>675</td>
<td>716</td>
<td>920</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 167.9 lb./ac.
2. V marginal means = 72.2 lb./ac.
3. V means at the same level of D = 144.3 lb./ac.
4. D means at the same level of V = 196.3 lb./ac.

Crop :- Rape.  
Ref :- I.A.R.I. 50(9a).  
Type :- 'M'.

Object :- To determine the nutritional requirements of Indian soils.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to I.A.R.I. 50(9) under OATS.

5. RESULTS:
(i) 458.3 lb./ac.
(ii) 102.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>257.6</td>
<td>5.</td>
<td>391.3</td>
</tr>
<tr>
<td>2.</td>
<td>389.2</td>
<td>6.</td>
<td>384.3</td>
</tr>
<tr>
<td>3.</td>
<td>389.2</td>
<td>7.</td>
<td>395.0</td>
</tr>
<tr>
<td>4.</td>
<td>434.5</td>
<td>8.</td>
<td>398.2</td>
</tr>
</tbody>
</table>

S.E./mean = 51.02 lb./ac.

Crop :- Rape.  
Ref :- I.A.R.I. 51(8a).  
Type :- 'M'.

Object :- To determine the nutritional requirements of Indian soils.

1. BASAL CONDITIONS to 4. GENERAL.

Please refer to No. I.A.R.I. 51(8) under OATS.

5. RESULTS:
(i) 1302 lb./ac.
(ii) 117.7 lb./ac.
(iii) Treatments do not differ significantly.
Crop : Sesamum (*Kharif*). Ref. I.A.R.I. 52(61). Type : 'M'.

Object : To study the effect of different forms of organic and inorganic manures in combination with *P* on the yield of Sesamum.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 4.7.1952. (iv) (a) 1 ploughing with victory plough. 2 with *desi* and one with tractor. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 6 to 13, 16.10.1952, and 21 to 26.10.52.

2. TREATMENTS:
   Main-plot treatments:
   - 3 sources of *N*: *S* 1 = A/S, *S* 2 = F.Y.M. and *S* 3 = G.N.C.
   Sub-plot treatments:
   - All combinations of (1) and (2)
     (1) 3 levels of *N*: *N* 0 = 0, *N* 1 = 30 and *N* 2 = 60 lb./ac.
     (2) 2 levels of *P* 205: *P* 0 = 0 and *P* 1 = 8(1) lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication and 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 33’x22’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Poor germination (ii) Nil. (iii) Yield of sesameum. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 441 lb./ac.
   (ii) (a) 176.1 lb./ac.
   (b) 238.6 lb./ac.
   (iii) None of the effects is significant.
   (iv) *Av* yield of sesameum in lb./ac.

<table>
<thead>
<tr>
<th><em>N</em> 0</th>
<th><em>N</em> 1</th>
<th><em>N</em> 2</th>
<th><em>N</em> 3</th>
<th><em>N</em> 4</th>
<th><em>N</em> 5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>361</td>
<td>407</td>
<td>387</td>
<td>408</td>
<td>444</td>
<td>508</td>
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<td>406</td>
<td>518</td>
<td>471</td>
<td>468</td>
<td>534</td>
<td>501</td>
<td>444</td>
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<td>468</td>
<td>652</td>
<td>294</td>
<td>490</td>
<td>357</td>
<td>429</td>
<td>405</td>
</tr>
</tbody>
</table>

Mean

| 385  | 492  | 465  | 489  | 389  | 425  | 441  |      |

S.E. of difference of two
1. *S* marginal means  = 51.0 lb./ac.
2. *NP* marginal means = 97.4 lb./ac.
3. *NP* means at the same level of *S* = 168.7 lb./ac.
4. *S* means at the same level of *NP* = 162.2 lb./ac.
Crop:-Sesamum *(Khari)*. Ref:-I.A.R.I. S3(62). Type:-'M'.

Object :-To study the effect of different forms of 'N' organic and inorganic in contrast with P manures.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 21.6.1953. (iv) (a) 3 ploughings with desi plough and one with victory plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with oudh and horse plough, *kera* and weeding. (ix) N.A. (x) 6.10.1953.

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): S1=0, N1=30 and N2=60 lb/ac.

3. DESIGN:
   (i) Split-plot. (ii) 3 main-plots/block and 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination good. (ii) Virus disease. (iii) Yield of sesamum. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (x) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 223.8 lb/ac.
   (ii) (a) 186.2 lb/ac. (b) 133.3 lb/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of sesamum in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>Np0</th>
<th>Np1</th>
<th>Np2</th>
<th>Np3</th>
<th>Np4</th>
<th>Np5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>275.6</td>
<td>199.1</td>
<td>288.8</td>
<td>166.2</td>
<td>215.6</td>
<td>267.4</td>
<td>249.3</td>
</tr>
<tr>
<td>S2</td>
<td>177.7</td>
<td>244.4</td>
<td>200.8</td>
<td>219.7</td>
<td>144.8</td>
<td>182.7</td>
<td>195.0</td>
</tr>
<tr>
<td>S3</td>
<td>222.2</td>
<td>138.2</td>
<td>292.9</td>
<td>232.9</td>
<td>232.9</td>
<td>244.4</td>
<td>227.1</td>
</tr>
<tr>
<td>Mean</td>
<td>225.5</td>
<td>194.2</td>
<td>260.8</td>
<td>206.5</td>
<td>224.6</td>
<td>231.2</td>
<td>223.8</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. S marginal means =31.3 lb/ac.
2. NP marginal means =54.4 lb/ac.
3. NP means at the same level of S =76.8 lb/ac.
4. S means at the same level of NP =91.6 lb/ac.

Crop :- Linseed *(Rabi)*. Ref :- I.A.R.I. 50 (22). Type:-'MV'.

Object :-To see the effect of nitrogenous manures on Linseed varieties.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 7.11.1950. (iv) (a) 2 ploughings, 2 beamings, 2 harrowings with spring tooth harrow and levelling with *kera*. (b) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 11 to 14.4.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   1. 4 varieties : V1=N P-21, V2=B-5128, V3=Dakota flax and V4=Shaycone flax.
   2. 2 levels of N : N0=0 and N1=20 lb/ac of N.
3. DESIGN:
(i) 4x2 Fact. in R.B.D.  (ii) (a) B. (b) N.A.  (iii) 4.  (iv) (a) 19'x25'. (b) 17'x23'. (v) 1' on each side.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Yield of linseed.  (iv) (a) No. (b) No. (c) N.A.  (v) (a), (b) No.  (vi) Nil.  (vii) Nil.

5. RESULTS:
(i) 457.4 lb./ac.
(ii) 93.01 lb./ac.
(iii) V and N effects are highly significant while interaction is not significant.
(iv) Avg. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>455.5</td>
<td>392.7</td>
<td>396.3</td>
<td>324.9</td>
<td>399.8</td>
</tr>
<tr>
<td>N₁</td>
<td>621.2</td>
<td>524.8</td>
<td>556.9</td>
<td>357.0</td>
<td>515.0</td>
</tr>
<tr>
<td>Mean</td>
<td>555.3</td>
<td>458.7</td>
<td>476.6</td>
<td>340.9</td>
<td>457.4</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of V = 32.88 lb./ac.
S.E. of marginal mean of N = 23.25 lb./ac.
S.E. of body of table = 46.50 lb./ac.

Crop :- Linseed (Rabi).  Ref :- I.A.R.I. 51(28).  Type :- 'MV'.

Objective:- To study the relative performance of some improved American variety in relation with doses of N.

1. BASAL CONDITIONS:
(i) (a) No. (b) N.A. (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 18.10.1951.  (iv) (a) 1 pateva and 1 desi ploughing.  (b) to (e) N.A.  (v) Nil. (vi) to (ix) N.A.  (x) April, May, 1952.

2. TREATMENTS:
All combinations of (1) and (2)
1. 4 varieties: V₁ = N.P. 21, V₂ = B. 5128, V₃ = Dakota flax and V₄ = Sheycone flax.
2. 3 levels of N as C/N: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.

3. DESIGN:
(i) 3x4 fact. in R.B.D.  (ii) 12. (b) N.A.  (iii) 4. (iv) (a) 4'x16'. (b) N.A.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Below normal.  (ii) N.A.  (iii) Yield of linseed.  (iv) (a) 1949—N.A. (b) N.A. (c) N.A.  (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 407 lb./ac.
(ii) 80.64 lb./ac.
(iii) V effect alone is highly significant.
(iv) Avg. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
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<td>541</td>
<td>341</td>
<td>203</td>
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<tr>
<td>N₁</td>
<td>434</td>
<td>546</td>
<td>375</td>
<td>314</td>
<td>417</td>
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<tr>
<td>N₂</td>
<td>443</td>
<td>589</td>
<td>353</td>
<td>311</td>
<td>424</td>
</tr>
</tbody>
</table>

Mean 434 559 356 277 407

S.E. of marginal means of V = 23.28 lb./ac.
S.E. of marginal means of N = 20.16 lb./ac.
S.E. of body of table = 40.32 lb./ac.
Crop: Linseed (Rabi)  
R.245-Sub.R.I. 52(50).  
Type: ‘MV’.  

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

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30 and 31.10.1952 and 4, 5.11.1952. (iv) (a) 3 ploughings with first plough, 2 tractor discings and 1 tractor grubbing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 hooeing and 2 weeding. (ix) N.A. (x) 31.3.1953 to 9.4.1953.

2. TREATMENTS:
   **Main-plot treatments:**

   **Sub-plot treatments:**
   - All combinations of (1) and (2)
     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=60 lb./ac.

   **Sub-sub-plot treatments:**
   - 2 methods of application: M₁=Broadcast and M₂=3½' deep placement.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block, 6 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 27’×23’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of linseed. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 884.0 lb./ac.
   (ii) 241.1 lb./ac.
   (b) 288.8 lb./ac.
   (c) 148.6 lb./ac.
   (iii) NP effect is highly significant, V×M and V×NP effects and interactions are significant while others are not significant.
   (iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
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<th>M₁</th>
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</tr>
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<tbody>
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<td>878</td>
</tr>
<tr>
<td>N₁P₀</td>
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<td>753</td>
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<tr>
<td>N₂P₀</td>
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<td>967</td>
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<td>949</td>
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<tr>
<td>N₁P₁</td>
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<td>753</td>
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<td>M₁</td>
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<td>M₂</td>
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<td>897</td>
<td>901</td>
<td>1039</td>
<td>785</td>
<td>768</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. V marginal means = 40.2 lb./ac.  2. NP marginal means = 53.4 lb./ac.  3. M marginal means = 34.8 lb./ac.
4. NP means at the same level of V = 144.4 lb./ac.  5. V means at the same level of NP = 140.6 lb./ac.
Crop: Linseed (Rabi).  
Ref: I.A.R.I. 53(65).  
Type: ‘MV’.

Object: -To study the effect of placement of fertilizers on different varieties of Linseed.

1. BASAL CONDITIONS:
   (i) (a) No, (b) and (c) N.A.  
   (ii) (a) and (b) Refer item 11 on page 143.  
   (iii) 14/15.10.1953.  
   (iv) (a) Tractor grubbing, 2 ploughings with dest plough and 2 tractor ploughings.  
   (b) to (e) N.A.  
   (v) Nil.  
   (vi) N.A.  
   (vii) Irrigated.  
   (viii) 3 weedings.  
   (ix) N.A.  
   (x) 3, 7, 19, 20 and 23.4.1954.

2. TREATMENTS:
   Main-plot treatments:

   Sub-plot treatments:
   - All combinations of (1) and (2)
     - (1) 3 levels of N: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
     - (2) 2 levels of P₀: P₀ = 0 and P₁ = 0.60 lb./ac.

   Sub-sub-plot treatments:
   - 2 methods of application: M₁ = Broadcast and M₂ = 3½” deep 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) N.A.  
   (b) 27’X23’.  
   (v) N.A.  
   (vi) Yes.

4. GENERAL:
   (i) Normal.  
   (ii) N.A.  
   (iii) Yield of linseed.  
   (iv) (a) 1951—1956.  
   (b) Yes.  
   (c) N.A.  
   (v) (a) and (b) N.A.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 758.5 lb./ac.
   (ii) (a) 188.7 lb./ac.
   (b) 148.0 lb./ac.
   (c) 145.6 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀P₀</th>
<th>N₀P₁</th>
<th>N₁P₀</th>
<th>N₁P₁</th>
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<td>649.2</td>
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<td>V₂</td>
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<td>766.5</td>
<td>708.3</td>
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<td>721.4</td>
<td>775.5</td>
<td>746.3</td>
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<td>V₃</td>
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<td>762.0</td>
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<td>833.1</td>
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<td>763.5</td>
<td>768.1</td>
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<tr>
<td>M₂</td>
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<td>760.9</td>
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<td>808.5</td>
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S.E. of difference of two:
1. V marginal means = 38.5 lb./ac.  
2. NP marginal means = 42.7 lb./ac.  
3. D marginal means = 24.3 lb./ac.  
4. NP means at the same level of V = 74.0 lb./ac.  
5. V means at the same level of NP = 77.8 lb./ac.
Crop: Jowar (Kharif).

Object: - To study the effect of manuring on the yield of berseem and the residual effect on the following maize, wheat and Jowar crops.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Berseem. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 25.6.50. (iv) (a) Ploughing with tractor, grubbing and beamung and harrowing twice after sowing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) 24.99". (x) 29.950.

2. TREATMENTS:
   Main-plot treatments:
   7 levels of N and P fertilizers: M_0 = 0, M_1 = Ammo. Phos. at 80 lb./ac. of P_2O_5, M_2 = Super at 80 lb./ac. of P_2O_5 + A/S at 80 lb./ac of N, M_3 = Super at 80 lb./ac. of P_2O_5 + A/S at 160 lb./ac. of N, M_4 = Super at 80 lb./ac. of P_2O_5 and M_6 = Super at 160 lb./ac. of P_2O_5.

   Sub-plot treatments:
   3 levels of K_2O as Pot. Sulf.: K_0 = 0, K_1 = 40 lb./ac. and K_2 = 80 lb./ac. of K_2O.

3. DESIGN:
   (i) Split-plot. (ii) 7 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 43'x25'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Growth was poor on the whole. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1946—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Growth affected adversely due to water logging caused by rains in July and August. (vii) Nil.

5. RESULTS:
   (i) 2.98 ton/ac.
   (ii) 1.09 ton/ac.
   (b) 0.59 ton/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of fodder in ton/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>M_5</th>
<th>M_6</th>
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<td>3.48</td>
<td>3.29</td>
<td>3.20</td>
<td>3.14</td>
<td>3.00</td>
<td>3.10</td>
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<td>K_1</td>
<td>1.98</td>
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<td>3.50</td>
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<td>K_2</td>
<td>2.34</td>
<td>2.51</td>
<td>2.81</td>
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<td>3.50</td>
<td>2.44</td>
<td>3.69</td>
<td>2.86</td>
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<tr>
<td>Mean</td>
<td>2.23</td>
<td>3.13</td>
<td>3.17</td>
<td>3.14</td>
<td>3.11</td>
<td>2.71</td>
<td>3.40</td>
<td>2.98</td>
</tr>
</tbody>
</table>

   S.E. of difference of two
   1. main-plot treatment means = 0.45 ton/ac.
   2. sub-plot treatment means = 0.16 ton/ac.
   3. sub-plot treatment means at the same level of main-plot treatment = 0.43 ton/ac.
   4. main-plot treatment means at the same level of sub-plot treatment = 1.33 ton/ac.

---

Crop: Jowar.

Ref: I.A.R.I. 52(28a).

Object: - To study the effect of sowing premature and mature seed on Jowar yield.

1. BASAL CONDITIONS
   Please refer to No. I.A.R.I. 52(28) under MAIZE.

5. RESULTS:
   Jowar: - White Purhi
   (i) 3579 lb./ac.
   (ii) 112.0 lb./ac.
   (iii) Treatments differ highly significantly.

   Jowar: - local
   (i) 5983 lb./ac.
   (ii) 112.0 lb./ac.
   (iii) Treatments differ highly significantly.
Crop: Guar (Khari).

Object: To find the response of Guar to P and application of micro-nutrients and their effect on Wheat.

1. BASAL CONDITIONS:

(i) (a) Guar-Wheat-Guar. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 3.7.1951.
(iv) (a) Ploughing twice. (b) Seed sown in furrows behind plough with \\textit{kuru}. (c) to (e) N.A. (v) N.A.

2. TREATMENTS:

1. Guar without P\textsubscript{2}O\textsubscript{5} removed.
2. Guar without P\textsubscript{2}O\textsubscript{5} buried.
3. Guar with 60 lb./ac. of P\textsubscript{2}O\textsubscript{5} removed.
4. Guar with 60 lb./ac. of P\textsubscript{2}O\textsubscript{5} buried.
5. Guar with 60 lb./ac. of P\textsubscript{2}O\textsubscript{5}+Borax 5 lb./ac.+Molybdenum 1 lb./ac. removed.
6. Guar with 60 lb./ac. of P\textsubscript{2}O\textsubscript{5}+Borax 5 lb./ac.+Molybdenum 1 lb./ac. buried.
7. Guar from treatment 1 buried.
8. Guar from treatment 3 buried.
9. Guar from treatment 5 buried.
10. Fallow.

3. DESIGN:

(i) R.B.D. (ii) (a) 10, (b) N.A. (iii) 6. (iv) (a) 45'x15'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. No lodging. (ii) Nil. (iii) Fodder yield. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a),
(b) No. (vi) Nil. (vii) Raw data is N.A.

5. RESULTS:

(i) 0.56 ton./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of fodder in ton./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.51</td>
</tr>
<tr>
<td>2</td>
<td>0.60</td>
</tr>
<tr>
<td>3</td>
<td>0.54</td>
</tr>
<tr>
<td>4</td>
<td>0.59</td>
</tr>
<tr>
<td>5</td>
<td>0.58</td>
</tr>
<tr>
<td>6</td>
<td>0.57</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Crop: Guar (Khari).

Object: To find the response of Guar to P and application of micro-nutrients and their effect on Wheat.

1. BASAL CONDITIONS:

(i) (a) Guar-Wheat-Guar. (b) Wheat. (c) N.A. (d) (a) and (b) Refer item 11 on page 143. (iii) N/A.
(iv) (a) to (e) N.A. (v) to (x) N.A.
2. TREATMENTS:

1. *G. dumosa* without phosphorus removed.
2. *G. dumosa* without phosphorus buried.
3. *G. dumosa* with 60 lb./ac. of phosphorus removed.
4. *G. dumosa* with 60 lb./ac. of phosphorus buried.
5. *G. dumosa* with 60 lb./ac. of phosphorus + molybdenum 1 lb./ac. removed.
6. *G. dumosa* with 60 lb./ac. of phosphorus + molybdenum 1 lb./ac. buried.
7. *G. dumosa* from treatment 1 buried.
8. *G. dumosa* from treatment 2 buried.
9. *G. dumosa* from treatment 3 buried.
10. Fallow.

3. DESIGN:

(i) R.B.D. (ii) (a) 10, (b) N.A. (iii) 6. (iv) (a) N.A. (b) 45' × 15'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A (iii) Yield of *G. dumosa* fodder. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) (a), (b) No, (vi) and (vii) Nil.

5. RESULTS:

(i) 7.04 ton/ac.
(ii) 0.84 ton/ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>5.23</td>
</tr>
<tr>
<td>2.</td>
<td>6.78</td>
</tr>
<tr>
<td>3.</td>
<td>6.92</td>
</tr>
<tr>
<td>4.</td>
<td>7.58</td>
</tr>
<tr>
<td>5.</td>
<td>7.85</td>
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<tr>
<td>6.</td>
<td>7.92</td>
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</tbody>
</table>

S.E./mean = 0.34 ton/ac.

---

Crop: *Hubam Clover (Rabi)*. Ref: I.A.R.I. 51(22). Type: 'CM'.

Object: To study the response of *Hubam Clover* grown for fodder, seed and green manuring and its effect on soil fertility as judged by the yield of following maize crop.

1. BASAL CONDITIONS:

(i) (a) Hubam Clover—Maize. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 21.11.1951. (iv) (a) 1 ploughing with victory plough, 2 discing with tractor and 2 grubbing. (b) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 3 weeding. (ix) N.A. (a) 22.3.1952, 2.5.1952 and 9.6.1952.

2. TREATMENTS:

Main-plot treatments:

4 levels of P₂O₅: P₀=0, P₁=40, P₂=60 and P₃=120 lb./ac.

Sub-plot treatments:

6 cultural practices: C₁=Hubam Clover grown for seed, C₂=Hubam Clover left for seed after one cutting, C₃=Hubam Clover grown for green manuring, C₄=Hubam Clover grown after one cutting, C₅=Hubam Clover grown after two cuttings and C₆=Hubam Clover grown for fodder.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication and 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of fodder. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No, (vi) Raw data N.A. (vii) Nil.

5. RESULTS:

(i) 0.76 ton/ac.
(ii) N.A.
(iii) N.A.
Object:—To study the response of Hubam Clover grown for fodder, seed and green manuring and its effect on soil fertility as judged by the yield of following maize crop.

1. BASAL CONDITIONS:
   (i) (a) Maize—Hubam Clover. (b) Maize. (c) N.A. (i) (a) and (b) Refer item 11 on page 143. (iii) 29.11.1952. (iv) (a) 1 ploughing with victory plough and 2 with desi plough. (b) N.A. (c) 20 lb./ac. (d) and (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (a) 31.3.1953, 1.4.1953, 5.5.1953 and 5.6.1953.

2. TREATMENTS:
   Main-plot treatments:
   4 levels of P2O5: P0=0, P1=40, P2=80 and P3=120 lb./ac.
   Sub-plot treatments:
   6 cultural practices: C1=Hubam Clover grown for seed, C2=Hubam Clover left for seed after one cutting, C3=Hubam Clover grown for green manuring, C4=Hubam Clover grown after one cutting, C5=Hubam Clover grown after two cuttings and C6=Hubam Clover grown for fodder.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block and 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of fodder. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Raw data N.A.

5. RESULTS:
   (i) 6.47 ton/ac.
   (ii) N.A.
   (iii) N.A.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
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<td>6.33</td>
<td>6.46</td>
<td>6.69</td>
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S.E.—N.A.
Crop: - Hubam Clover (Rabi).  

Type: - "CM".

Object: - To study the response of different doses of phosphatic manures on Hubam Clover grown for fodder, seed and green manuring and its effect on soil fertility as judged by yield of following crop of maize.

1. BASAL CONDITIONS:
   (i) (a) Maize-Hubam Clover. (b) Maize. (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 17.11.53.  (iv) (a) 1 ploughing with victory plough and 2 with desi plough. (b) N.A.  (c) 10 yrs./ac.  (d) and (e) N.A.  (v) Nil.  (vi) N.A.  (vii) Irrigated.  (viii) to (x) N.A.

2. TREATMENTS:
   Main-plot treatments:  
   4 levels of \( P_2O_5 \):  
   \( P_0 = 0, P_1 = 40, P_2 = 80 \) and \( P_3 = 120 \) lb./ac.

   Sub-plot treatments:  
   6 cultural practices:  
   \( C_1 = \) Hubam Clover grown for seed, \( C_2 = \) Hubam Clover grown for seed after one cutting, \( C_3 = \) Hubam Clover grown for green manuring, \( C_4 = \) Hubam Clover grown for green manuring after one cutting, \( C_5 = \) Hubam Clover grown for green manuring after two cuttings and \( C_6 = \) Hubam Clover grown for fodder.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 4 main-plots/block and 6 sub-plots/main-plot.  (b) N.A.  (iii) 3.  (iv) (a) N.A.  (b) 1/100 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) N.A.  (ii) Nil.  (iii) Yield of fodder.  (iv) (a) 1951 - N.A.  (b) Yes.  (c) N.A.  (v) (a) and (b) No.  (vi) Nil.  (vii) Raw data. N.A.

5. RESULTS:
   (i) 7.74 ton/ac.
   (ii) N.A.
   (iii) N.A.
   (iv) Av. yield of fodder in ton/ac.

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<tr>
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<th>( P_2 )</th>
<th>( P_3 )</th>
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<td>6.68</td>
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<td>7.74</td>
<td>8.10</td>
<td>7.45</td>
<td>7.74</td>
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</table>

S.E. - N.A.

Crop: - Berseem (Rabi).  

Ref - I.A.R.I. 48(13).  
Type: - "M".

Object: - To study the response of phosphatic manuring of Berseem with and without K and N.

1. BASAL CONDITIONS:
   (i) (a) Manured berseem followed by unmanured Maize-Wheat-Maize.  (b) and (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) N.A.  (iv) (a) to (c) N.A.  (v) N.A.  (vi) N.A.  (vii) Irrigated.  (viii) Nil.  (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:  
   7 manures:  
   \( M_0 = \) Control, \( M_1 = \) Ammo. Phos. 80 lb./ac. of \( P_2O_5 \), \( M_2 = \) Ammo. Phos. 160 lb./ac. of \( P_2O_5 \), \( M_3 = \) Super 80 lb./ac. of \( P_2O_5 \), \( M_4 = \) Super 160 lb./ac. of \( P_2O_5 \), \( M_5 = \) Super 80 lb./ac. of \( P_2O_5 + A/S \) 80 lb./ac. of N and \( M_6 = \) Super 160 lb./ac. of \( P_2O_5 + A/S \) 80 lb./ac. of N.

   Sub-plot treatments:  
   3 levels of \( K_2O \) as Pot. Sol.:  
   \( K_0 = 0, K_1 = 40 \) and \( K_2 = 80 \) lb./ac.
3. DESIGN:
(i) Split-plot. (ii) (a) 7 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) 43' x 25'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1946—1949. (b) N.A. (c) N.A. (v) (a) and (b) No. (vi) N.A. (vii) Raw data and number of replication is N.A. Therefore the results are not complete.

5. RESULTS:
(i) 30.82 ton/ac.
(ii) N.A.
(iii) Main-plot treatments alone differ significantly.
(iv) Av. yield of fodder 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>M_4</th>
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<td>30.22</td>
<td>35.73</td>
<td>30.57</td>
<td>30.34</td>
<td>26.51</td>
<td>31.92</td>
</tr>
<tr>
<td>K_1</td>
<td>23.03</td>
<td>30.66</td>
<td>35.31</td>
<td>30.12</td>
<td>32.43</td>
<td>30.17</td>
<td>33.43</td>
</tr>
<tr>
<td>K_2</td>
<td>24.62</td>
<td>32.31</td>
<td>34.76</td>
<td>31.88</td>
<td>32.68</td>
<td>27.28</td>
<td>36.04</td>
</tr>
</tbody>
</table>

Mean 24.87 31.06 35.27 30.86 31.82 28.09 33.80 30.82

S.E. N.A.

Crop: Berseem (Rabi).
Ref: I.A.R.I. 50(41).
Type: 'M'.

Object: To study the effect of manuring on the yield of Berseem and the residual effect on the following maize, wheat and jowar.

1. BASAL CONDITIONS:
(i) N.A. (b) Maize. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 2.11.1950. (iv) (a) Discing twice. (b) to (c) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 2.91'. (x) 5.18.1951, 28.3.1951, 28.4.1951 and 29.5.1951.

2. TREATMENTS:
Main-plot treatments:
7 manures: M_0 = Control, M_1 = Ammon. Phos. 80 lb/acre of P_2O_5, M_2 = Ammon. Phos. 160 lb/acre of P_2O_5, M_3 = Ammon. Phos. 320 lb/acre of P_2O_5, M_4 = Super 80 lb/acre of P_2O_5, M_5 = Super 160 lb/acre of P_2O_5, M_6 = Super 320 lb/acre of P_2O_5, M_7 = Super 480 lb/acre of P_2O_5.
Sub-plot treatments:
3 levels of K_2O as Pot. Sul.: K_0 = 0, K_1 = 60 and K_2 = 80 lb/acre.

3. DESIGN:
(i) Split-plot. (ii) (a) 7 main-plots/block, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 43' x 25'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Fodder yield. (iv) (a) 1946—1947; N.A. (b) N.A. (c) N.A. (iv) (a), (b) No. (v) and (vi) Nil.

5. RESULTS:
(i) 22.16 ton/ac.
(ii) (a) 8.23 ton/ac.
(b) 2.62 ton/ac.
(iii) Main effect of M is highly significant. M x K is significant.
(iv) Av. yield of fodder in ton/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>M_7</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>K_0</td>
<td>8.55</td>
<td>25.28</td>
<td>28.19</td>
<td>20.04</td>
<td>22.50</td>
<td>22.57</td>
<td>25.29</td>
<td>21.77</td>
</tr>
<tr>
<td>K_1</td>
<td>7.52</td>
<td>25.91</td>
<td>26.57</td>
<td>21.87</td>
<td>25.65</td>
<td>24.33</td>
<td>25.03</td>
<td>22.41</td>
</tr>
<tr>
<td>K_2</td>
<td>9.10</td>
<td>22.61</td>
<td>24.85</td>
<td>23.89</td>
<td>27.78</td>
<td>21.40</td>
<td>26.53</td>
<td>22.31</td>
</tr>
<tr>
<td>Mean</td>
<td>8.39</td>
<td>24.60</td>
<td>26.54</td>
<td>21.93</td>
<td>23.31</td>
<td>22.77</td>
<td>25.62</td>
<td>22.16</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means = 3.36 ton/ac.
2. K marginal means = 0.70 ton/ac.
3. K means at the same level of M = 1.86 ton/ac.
4. M means at the same level of K = 3.68 ton/ac.

Crop: - Berseem (Rabi).  Ref: - I.A.R.I. 50(60).  Type: - 'M'.

Object: - To study the effect of P on the yield of Berseem and residual effect on the subsequent crop.

1. BASAL CONDITIONS:
   (i) (a) Berseem-Cowpeas-Berseem. (b) Cowpeas. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 3, 4, 11, 1950. (iv) (a) 1 tractor discing (double), 2 grubblings and 1 disting. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 25.1.1951; 5.3.1951 and 1.4.1951.

2. TREATMENTS:
   1. No manure.
   2. F.Y.M. at 16 lb/ac of P_2O_5.
   3. F.Y.M. at 32 lb/ac of P_2O_5.
   4. F.Y.M. at 64 lb/ac of P_2O_5.
   5. Super at 16 lb/ac of P_2O_5.
   6. Super at 32 lb/ac of P_2O_5.
   7. Super at 64 lb/ac of P_2O_5.
   8. Super at 8 lb/ac of P_2O_5 + F.Y.M. at 8 lb/ac of P_2O_5.
   9. Super at 8 lb/ac of P_2O_5 + F.Y.M. at 24 lb/ac of P_2O_5.
   10. Super at 8 lb/ac of P_2O_5 + F.Y.M. at 56 lb/ac of P_2O_5.
   11. F.Y.M. at 8 lb/ac of P_2O_5 + Super at 24 lb/ac of P_2O_5.
   12. F.Y.M. at 8 lb/ac of P_2O_5 + Super at 36 lb/ac of P_2O_5.
   13. Fallow.

3. DESIGN:
   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 6. (iv) (a) 63' × 15'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of berseem fodder and seed. (iv) (a) 1948-1954. (b) Yes. (c) N.A.
   (v) (a), (b) No. (vi) Crop in unmanured plots remained stunted in growth and the colour of the leaves was predominantly red till 2nd cutting. (vii) Nil.

5. RESULTS:

   Fodder
   (i) 8.39 ton/ac.
   (ii) 1.94 ton/ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0.78</td>
</tr>
<tr>
<td>2.</td>
<td>2.77</td>
</tr>
<tr>
<td>3.</td>
<td>6.22</td>
</tr>
<tr>
<td>4.</td>
<td>9.09</td>
</tr>
<tr>
<td>5.</td>
<td>6.34</td>
</tr>
<tr>
<td>6.</td>
<td>9.97</td>
</tr>
<tr>
<td>7.</td>
<td>13.34</td>
</tr>
<tr>
<td>8.</td>
<td>5.86</td>
</tr>
<tr>
<td>9.</td>
<td>8.00</td>
</tr>
<tr>
<td>10.</td>
<td>13.07</td>
</tr>
<tr>
<td>11.</td>
<td>11.02</td>
</tr>
<tr>
<td>12.</td>
<td>14.23</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-0.79 ton/ac.</td>
</tr>
</tbody>
</table>

   Seed
   (i) 233.7 lb/ac.
   (ii) 52.66 lb/ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of seed in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>32.1</td>
</tr>
<tr>
<td>2.</td>
<td>147.3</td>
</tr>
<tr>
<td>3.</td>
<td>204.1</td>
</tr>
<tr>
<td>4.</td>
<td>280.6</td>
</tr>
<tr>
<td>5.</td>
<td>197.5</td>
</tr>
<tr>
<td>6.</td>
<td>260.8</td>
</tr>
<tr>
<td>7.</td>
<td>302.0</td>
</tr>
<tr>
<td>8.</td>
<td>204.9</td>
</tr>
<tr>
<td>9.</td>
<td>259.2</td>
</tr>
<tr>
<td>10.</td>
<td>323.4</td>
</tr>
<tr>
<td>11.</td>
<td>282.2</td>
</tr>
<tr>
<td>12.</td>
<td>307.7</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-21.49 lb/ac.</td>
</tr>
</tbody>
</table>
Crop :- Berseem (Rabi).

Object :- To study the residual effect of different forms of phosphates on the following maize-berseem and maize-fodder crops.

1. BASAL CONDITIONS :
   (i) Maize-Berseem-Maize. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 8, 9,11.1950. (iv) (a) Tractor plough at the end of October 1950. Grubbing twice after tractor ploughing. (b) to (e) N A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 5 cuttings from 31.1.1951 to 27.5.1951.

2. TREATMENTS :
   3. A.S.
   4. B.M.
   5. Bone Super.
   7. Mg. Phosphate.
   8. Reno. hyper Phosphate.
   10. Selecto Phosphate.
   12. Control.

   These sources give 80 lb./ac. of N or P₂O₅.

3. DESIGN :
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 17'X64'. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Poor till 2nd cutting. (ii) Locust attack. (iii) Yield of fodder. (iv) (a) 1948—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :
   (i) 9.02 ton/ac.
   (ii) 3.53 ton/ac.
   (iii) Treatments differ highly significantly.
   (iv) AV. yield of fodder in ton/ac.

   Treatment | AV. yield | Treatment | AV. yield
   ----------|-----------|-----------|-----------
   1. 7.85   | 7.39      |
   2. 17.35  | 6.37      |
   3. 10.14  | 5.96      |
   4. 12.35  | 8.29      |
   5. 9.71   | 7.98      |
   6. 8.47   |            |

   S.E/mean = 1.44 ton/ac.

Crop :- Berseem (Rabi).

Object :- To study the response of berseem to fertilizers and comparison of residual effects with direct manuring of cereals.

1. BASAL CONDITIONS :
   (i) (a). No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 12.10.1950. (iv) (a) Tractor ploughing once, tractor discings 4 and 1 grubbing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Seed mixed with spring time harrow after broadcasting. (ix) N.A. (x) 5 cuttings from 30.12.1950 to 10.5.1951.

2. TREATMENTS :
   1. No manure.
   2. 120 lb/ac. of N.
   3. 40 lb/ac. of N+120 lb/ac. of P₂O₅.
   4. 120 lb/ac. of P₂O₅+80 lb/ac. of K₂O.
   5. 40 lb/ac. of N+120 lb/ac. of P₂O₅+80 lb/ac. of K₂O.
   6. Fallow in Rabi.

3. DESIGN :
   (i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/20 ac. (v) N.A. (vi) Yes.
4. GENERAL:
(i) N.A. (ii) No. (iii) Yield of fodder. (iv) (a) No. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 23.88 ton/arc.
(ii) 2.97 ton/arc.
(iii) Treatments differ highly significantly.
(iv) Av. yield of fodder in ton/arc.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>12.96</td>
</tr>
<tr>
<td>2.</td>
<td>28.33</td>
</tr>
<tr>
<td>3.</td>
<td>28.94</td>
</tr>
<tr>
<td>4.</td>
<td>30.54</td>
</tr>
<tr>
<td>5.</td>
<td>29.85</td>
</tr>
<tr>
<td>6.</td>
<td>12.70</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.21 ton/arc</td>
</tr>
</tbody>
</table>

Crop: Berseem (Rabi).  
Type: 'M'.

Object: To study the relative value of different phosphatic manures.

1. BASAL CONDITIONS:
(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.10.1950. (iv) (a) Ploughing with victory plough and 2 with desi plough. (b) to (e) N.A. (v) 10 oz./plot of A/S. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 1st cutting on 7,8.1.1954, 2nd cutting on 23/26.2.1954 and 3rd cutting on 25/27.3.1954.

2. TREATMENTS:
1. Control.
2. Rock Phos. at 10 lb./ac. of P4O10.
3. Super at 50 lb./ac. of P2O5+ Rock Phos. at 50 lb./ac. of P4O10.
4. Super at 100 lb./ac. of P2O5.
5. B.M. at 100 lb./ac. of P2O5.
6. Farm B.M. powder at 100 lb./ac. of P2O5.
7. B.M. grade I at 100 lb./ac. of P2O5.
8. B.M. grade II at 100 lb./ac. of P2O5.
9. B.M. grade III at 100 lb./ac. of P2O5.
10. Trichini-nodules at 100 lb./ac. of P2O5.
11. Trichini-nodules at 50 lb./ac. of P2O5+Super at 50 lb./ac. of P2O5.
12. Super at 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) and (ii) N.A. (iii) Yield of fodder. (iv) (a) 1953—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) N.A. (vii) Nil.

5. RESULTS:
(i) 7.18 ton/arc.
(ii) 2.45 ton/arc.
(iii) Treatments differ highly significantly.
(iv) Av. yield of fodder in ton/arc.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>5.84</td>
</tr>
<tr>
<td>2.</td>
<td>7.56</td>
</tr>
<tr>
<td>3.</td>
<td>8.03</td>
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<tr>
<td>4.</td>
<td>9.75</td>
</tr>
<tr>
<td>5.</td>
<td>5.54</td>
</tr>
<tr>
<td>6.</td>
<td>5.50</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.99 ton/arc</td>
</tr>
</tbody>
</table>
Crop : Berseem (Rabi).  Ref : I.A.R.I. S1(9).  Type : 'M'.

Object :—To study the effect of phosphatic manuring of Berseem with and without K and N on rotation of crops.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Berseem—Cotton. (b) Seed cotton. (c) Nil. (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 12.10.1951. (iv) (a) 2 ploughings with victory plough and 2 with desi plough. (b) to (e) N.A. (v) Nil.

2. TREATMENTS:
   1. Control.
   2. \( \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} \)
   3. \( \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} + \text{K}_2\text{O} \text{ at 120 lb./ac.} \)
   4. \( \text{N} \text{ at 100 lb./ac.} + \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} \)
   5. \( \text{N} \text{ at 25 lb./ac.} + \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} \)
   6. \( \text{N} \text{ at 50 lb./ac.} + \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} \)
   7. \( \text{N} \text{ at 100 lb./ac.} + \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} + \text{K}_2\text{O} \text{ at 120 lb./ac.} \)
   8. Fallow in Rabi.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 36' x 18'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Crop lodged on account of heavy rains. (ii) N.A. (iii) Yield of fodder. (iv) (a) 1948—1953. (b) Yes.
   (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 25.56 ton/ac
   (ii) 1.08 ton/ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>10.43</td>
</tr>
<tr>
<td>2.</td>
<td>25.05</td>
</tr>
<tr>
<td>3.</td>
<td>25.16</td>
</tr>
<tr>
<td>4.</td>
<td>27.67</td>
</tr>
<tr>
<td>5.</td>
<td>27.77</td>
</tr>
<tr>
<td>6.</td>
<td>28.78</td>
</tr>
<tr>
<td>7.</td>
<td>32.04</td>
</tr>
</tbody>
</table>

S.E./mean = 0.44 ton/ac.

Crop : Berseem (Rabi).  Ref : I.A.R.I. S2(9).  Type : 'M'.

Object :—To study the residual effect of phosphatic manuring of Berseem with and without K and N on rotation of crops.

1. BASAL CONDITIONS:
   (i) (a) Wheat Berseem—Cotton. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 21 and 22.10.52. (iv) (a) 1 ploughing with victory plough and beaming across. (b) to (e) N.A. (v) Nil.
   (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A. (x) 2, 3.1.53, 24.2.53, 27.3.53 and 30.4.53.

2. TREATMENTS:
   1. Control.
   2. \( \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} \)
   3. \( \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} + \text{K}_2\text{O} \text{ at 120 lb./ac.} \)
   4. \( \text{N} \text{ at 100 lb./ac.} + \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} \)
   5. \( \text{N} \text{ at 25 lb./ac.} + \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} \)
   6. \( \text{N} \text{ at 50 lb./ac.} + \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} \)
   7. \( \text{N} \text{ at 100 lb./ac.} + \text{P}_2\text{O}_5 \text{ at 120 lb./ac.} + \text{K}_2\text{O} \text{ at 120 lb./ac.} \)
   8. Fallow in Rabi.

Applied to berseem in Rabi 1951.
Crop: Berseem (Rabi). Ref: I.A.R.I. 53(12). Type r-'M'.

Object: To study the effect of phosphatic manuring of Berseem with and without K and N on rotation of crops.

1. BASAL CONDITIONS:
   (i) (a) Cotton-Berseem-Wheat. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 9.10.53. (iv) (a) 4 ploughings with desi plough and mixing the fertilizers with desi plough. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   1. Control.
   2. P₂O₅ at 120 lb./ac.
   3. P₂O₅ at 120 lb./ac.+K₂O at 120 lb./ac.
   4. N at 100 lb./ac.+P₂O₅ at 120 lb./ac.
   5. N at 25 lb./ac.+P₂O₅ at 120 lb./ac.
   6. N at 50 lb./ac.+P₂O₅ at 120 lb./ac.
   7. N at 100 lb./ac.+P₂O₅ at 120 lb./ac.+K₂O at 120 lb./ac.
   8. Fallow in Rabi.
Fertilizers applied in Rabi 1951. Source is N.A.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36°×18'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of berseem fodder. (iv) (a) 1948—1953. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 41.05 ton/ac.
   (ii) 2.50 ton/ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18.53</td>
</tr>
<tr>
<td>2</td>
<td>44.63</td>
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<td>3</td>
<td>45.78</td>
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<td>4</td>
<td>45.95</td>
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<td>5</td>
<td>43.75</td>
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<td>6</td>
<td>44.10</td>
</tr>
<tr>
<td>7</td>
<td>47.64</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.02 ton/ac.</td>
</tr>
</tbody>
</table>
Crop :- Berseem (Rabi).  
Ref :- I.A.R.I. 52(62).  Type :- 'IM'.

Object :- To find out the optimum number of irrigations for different levels of N and P$_2$O$_5$.

1. BASAL CONDITIONS:
   (i) (a) No.  (b) N.A.  (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 8 to 11.11.1952.  (iv) (a) 1 ploughing with desi plough and 1 beaming with victory plough.  (b) to (e) N.A.  (v) N.A.  (vi) N.A.  (vii) Irrigated.  (viii) N.A.  (ix) N.A.  (x) 4, 5.1.1953.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   1. 2 levels of N as A/S : N$_0$=0 and N$_1$=30 lb./ac.
   2. 3 levels of P$_2$O$_5$ as Super : P$_0$=0, P$_1$=60 and P$_2$=120 lb./ac.

Sub-plot treatments:
3 levels of irrigation with 3$^\circ$ intensity : I$_1$=10, I$_2$=14 and I$_3$=18 irrigations.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 6 main-plots/block and 3 sub-plots/main-plot.  (b) N.A.  (iii) 3.  (iv) (a) 27'x20'.  (b) 20'x18'.  (v) 3'.  (vi) Yes.

4. GENERAL:
   (i) N.A.  (ii) N.A.  (iii) Fodder yield.  (iv) (a) 1952—N.A.  (b) Yes.  (c) N.A.  (v) (a), (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 33.50 ton/ac.
   (ii) (a) 4.427 ton/ac.
   (b) 2.080 ton/ac.
   (iii) Main effects of N, P and I are highly significant.  Others are not significant.
   (iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>P$_0$</th>
<th>P$_1$</th>
<th>P$_2$</th>
<th>Mean</th>
<th>I$_1$</th>
<th>I$_2$</th>
<th>I$_3$</th>
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</thead>
<tbody>
<tr>
<td>N$_0$</td>
<td>29.09</td>
<td>30.31</td>
<td>34.16</td>
<td>31.19</td>
<td>26.65</td>
<td>32.24</td>
<td>34.67</td>
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<tr>
<td>N$_1$</td>
<td>31.70</td>
<td>37.10</td>
<td>38.63</td>
<td>35.81</td>
<td>30.12</td>
<td>36.83</td>
<td>40.49</td>
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<tr>
<td>Mean</td>
<td>30.39</td>
<td>33.70</td>
<td>36.40</td>
<td>33.50</td>
<td>28.38</td>
<td>34.53</td>
<td>37.58</td>
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<tr>
<td>I$_1$</td>
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<td>28.16</td>
<td>30.38</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>I$_2$</td>
<td>30.92</td>
<td>34.80</td>
<td>37.87</td>
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<tr>
<td>I$_3$</td>
<td>33.65</td>
<td>38.15</td>
<td>40.94</td>
<td></td>
<td></td>
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</tbody>
</table>

S.E. of difference of two
1. N marginal means =0.852 ton/ac.  5. N means at the same level of I =1.447 ton/ac.
2. P marginal means =1.043 ton/ac.  6. I means at the same level of P =1.201 ton/ac.
3. I marginal means =0.490 ton/ac.  7. P means at the same level of I =1.772 ton/ac.
4. I means at the same level of N =0.980 ton/ac.  8. means of body of N×P table =1.476 ton/ac.

Crop :- Vicia Sativa (Rabi).  
Ref :- I.A.R.I. 53(30).  Type :- 'CM'.

Object :- To study the effect of different doses of phosphatic fertilizer and the number of cuttings on the yield of Vicia Sativa.

1. BASAL CONDITIONS:
   (i) (a) No.  (b) N.A.  (c) N.A.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) 3.11.1953.  (iv) (a) Ploughing with desi plough twice on 1.11.1953.  (b) to (e) N.A.  (v) N.A.  (vi) N.A.  (vii) Irrigated.  (viii) N.A.  (ix) N.A.  (x) 21.1.1954, 22.3.1954 and 6.3.1954.
2. TREATMENTS:
All combinations of (1) and (2)
1. 4 levels of $P_2O_5$: $P_2=0$, $P_2=40$, $P_2=80$ and $P_2=120$ lb/ac.
2. Number of cuttings: $C_1$=One and $C_2$=Two cuttings.

3. DESIGN:
(i) Factorial in R.B.D. (ii) (a) 8, (b) N.A. (iii) 4, (iv) (a) N.A. (b) 1/80 acre. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Fodder yield. (iv) (a) 1953—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 11.32 ton/ac.
(ii) 0.24 ton/ac.
(iii) Main effect of C and interaction $P \times C$ are highly significant. $P$ effect is significant. Others are not significant.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$P_3$</th>
<th>Mean</th>
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<tbody>
<tr>
<td>$C_1$</td>
<td>10.87</td>
<td>10.93</td>
<td>10.63</td>
<td>10.71</td>
<td>10.79</td>
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<tr>
<td>$C_2$</td>
<td>11.47</td>
<td>12.09</td>
<td>11.60</td>
<td>12.23</td>
<td>11.85</td>
</tr>
<tr>
<td>Mean</td>
<td>11.17</td>
<td>11.51</td>
<td>11.12</td>
<td>11.47</td>
<td>11.32</td>
</tr>
</tbody>
</table>

S.E. of $P$ marginal means = 0.06 ton/ac.
S.E. of $C$ marginal means = 0.08 ton/ac.
S.E. of body of table = 0.12 ton/ac.

Crop: Hubam Clover and Senji (Rabi). Ref = I.A.R.I. 51(47). Type = 'M'.

Object: To study the response of Hubam Clover—Senji mixture in two proportions to phosphatic manuring.

1. BASAL CONDITIONS:
(i) (a) No. (b) N.A. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.11.1951. (iv) (a) Ploughing with victory on 14.11.1951 and one with desi on 22.11.1951. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) Weeding on 26.2.1952. (ix) N.A. (x) Senji: Hubam : 1.3.1952, 27.4.1952, 29.3.1952, 30.4.1952 and 3.6.1952.

2. TREATMENTS:
All combinations of (1) and (2)
1. Types of G.M.: $G_1$=Hubam Clover, $G_2$=Senji, $G_3$=Hubam Clover+Senji ratio (1 : 1) and $G_4$=Hubam Clover+Senji (3 : 2).
2. 3 levels of $P_2O_5$: $P_2=0$, $P_2=40$ and $P_2=80$ lb/ac. of $P_2O_5$.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Yield of G.M. (iv) (a) 1951—1954. (b) Yes. (c) N.A. (v) 'a', (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 4.78 ton/ac.
(ii) 0.73 ton/ac.
(iii) G effect is highly significant. $P$ effect and interaction $P \times G$ is significant.
(iv) Av. yield of green manure in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>$G_1$</th>
<th>$G_2$</th>
<th>$G_3$</th>
<th>$G_4$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_0$</td>
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<td>3.67</td>
<td>5.57</td>
<td>4.41</td>
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<tr>
<td>$P_1$</td>
<td>5.62</td>
<td>3.33</td>
<td>4.03</td>
<td>5.54</td>
<td>4.63</td>
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<tr>
<td>$P_2$</td>
<td>4.79</td>
<td>4.73</td>
<td>6.02</td>
<td>5.69</td>
<td>5.60</td>
</tr>
</tbody>
</table>

Mean 5.16 3.80 4.57 5.60 | 4.78

S.E. of G marginal mean =0.24 ton/ac.
S.E. of P marginal mean =0.21 ton/ac.
S.E. of body of table =0.42 ton/ac.


Object:- To study the response of Hubam Clover—Senji mixture in two proportions to phosphatic manuring.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) As under treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 27.11.1953. (iv) (a) Ploughing with desi plough twice. (b) to (e) N.A. (v) Applied single super 36 seers with 20% $P_2O_5$. (vi) N.A. (vii) Irrigated. (viii) Weeding 22, 24.2.1953. (ix) N.A. (x) 25.2.1953, 26.3.1953, 8 and 9.5.1953 and 6.6.1953.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) Types of G.M.: $G_1=$Hubam Clover, $G_2=$Senji, $G_3=$Hubam Clover+Senji (1:1) and $G_4=$Hubam Clover+Senji (3:2).
   (2) 3 levels of $P_2O_5$: $P_0=0$, $P_1=40$ and $P_2=80$ lb/ac. of $P_2O_5$.

3. DESIGN:
   (i) 4x3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 7.45 ton/ac.
   (ii) 1.10 ton/ac.
   (iii) Only $P$ effect is significant.
   (iv) Av. yield of green manure in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>$G_1$</th>
<th>$G_2$</th>
<th>$G_3$</th>
<th>$G_4$</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>$P_0$</td>
<td>8.62</td>
<td>8.62</td>
<td>10.58</td>
<td>3.27</td>
<td>7.77</td>
</tr>
<tr>
<td>$P_1$</td>
<td>4.13</td>
<td>4.22</td>
<td>7.34</td>
<td>8.26</td>
<td>5.96</td>
</tr>
<tr>
<td>$P_2$</td>
<td>9.84</td>
<td>7.01</td>
<td>7.61</td>
<td>9.79</td>
<td>8.56</td>
</tr>
</tbody>
</table>

Mean 7.53 6.62 8.51 7.11 7.45

S.E. of G marginal mean =0.37 ton/ac.
S.E. of P marginal mean =0.32 ton/ac.
S.E. of body of table =0.64 ton/ac.
Crop :: Hubam Clover and Senji (Read). Ref :: I.A.R.I. 53(57). Type :: 'M'.

Object :: To study the response of Hubam Clover, Senji and Hubam and Senji mixture in two proportions to phosphatic manuring.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 30.11.1953. (iv) (a) Ploughing with victory plough (thrice). (b) N.A. (c) 20 lb./ac. (d) and (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Weeding on 17.2.1954. (ix) N.A. (x) 8.3.1954, 23.3.1954 and 30.4.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) Types of G.M. : G1=Hubam clover, G2=Senji, G3=Hubam+Senji (1 : 1) and G4=Hubam +Senji (3 : 2).
   (2) 3 levels of P2O5 : P1=0, P2=40 and P3=80 lb./ac. of P2O5.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/100 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Sub-normal. (ii) Nil. (iii) Yield of fodder. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Due to late rains the growth was sub-normal. (vii) Nil.

5. RESULTS:
   (i) 6.69 ton/ac.
   (ii) 0.92 ton/ac.
   (iii) Only G effect is highly significant.
   (iv) Av. yield of green manure in ton/ac.

<table>
<thead>
<tr>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>G4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4.28</td>
<td>6.57</td>
<td>6.24</td>
</tr>
<tr>
<td>P1</td>
<td>9.60</td>
<td>3.71</td>
<td>6.54</td>
<td>8.50</td>
</tr>
<tr>
<td>P2</td>
<td>9.95</td>
<td>4.52</td>
<td>8.12</td>
<td>6.63</td>
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<tr>
<td>Mean</td>
<td>8.39</td>
<td>4.17</td>
<td>7.07</td>
<td>7.13</td>
</tr>
</tbody>
</table>

S.E. of G marginal mean =0.31 ton/ac.
S.E. of P marginal mean =0.27 ton/ac.
S.E. of body of table =0.53 ton/ac.

Crop :: Pennium antedotale (Kharif). Ref :: I.A.R.I. 53(61). Type :: 'CM'.

Object :: To study the effect of N and optimum interval of cutting.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 24, 25.8.1953. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Irrigated. (viii) 1 hoeing with desi plough and 1 weeding. (ix) N.A. (x) 10.3.1954, 29.3.1954, 9.4.1954, 19.4.1954, 29.5.1954 and 6.61.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N : N0=0, N1=40, N2=80 and N3=120 lb./ac.
   (2) 3 intervals of cutting : C1=20, C2=30 and C3=40 days.

3. DESIGN:
   (i) 4x3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Below normal. (ii) Nil. (iii) Yield of fodder. (iv) (a) N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) 7.93 ton/ac.
(ii) 0.96 ton/ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of fodder in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>N_3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>8.04</td>
<td>8.46</td>
<td>9.62</td>
<td>8.31</td>
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<tr>
<td>C_3</td>
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<td>7.52</td>
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<td>9.10</td>
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<tr>
<td>Mean</td>
<td>6.49</td>
<td>7.64</td>
<td>8.27</td>
<td>9.32</td>
<td>7.93</td>
</tr>
</tbody>
</table>

S.E. of N marginal mean = 0.32 ton/ac.
S.E. of C marginal mean = 0.28 ton/ac.
S.E. of body of table = 0.55 ton/ac.

Crop: Maize and Sesamum (Kharif).
Ref: I.A.R.I. 52(36). Type: 'X'.

Object: To study the response of mixed cropping of Maize and Sesamum.

1. BASAL CONDITIONS:
   (i) (a) N.A.
   (ii) (a) and (b) Refer item 11 on page 143.
   (iii) 20, 21.7.1952.
   (iv) (a) 1 ploughing with victory plough on 21, 23.5.1952, tractor discing on 31.5.1952 and ploughing with desi on 5.7.1952 and 16.7.1952.
   (b) to (e) N.A.
   (v) Nil.
   (vi) Nil.
   (vii) Nil.
   (viii) 2 weedings.

2. TREATMENTS:
   1. Sesamum pure in lines.
   2. Maize pure in lines.
   3. Sesamum and maize in separate rows (full rate).
   4. Sesamum and maize in separate rows (full rate).
   5. Sesamum and maize in separate rows (½ rate).
   6. Sesamum and maize in same row (½ rate).

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

4. GENERAL:
   (i) Satisfactory.
   (ii) N.A.
   (iii) Yield of grain.
   (iv) (a) 1952—N.A.
   (b) Yes.
   (c) N.A.
   (d) Yes.

5. RESULTS:
   (i) 176.65 Rs./ac.
   (ii) 45.60 Rs./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. value in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>181.35</td>
</tr>
<tr>
<td>4</td>
<td>230.25</td>
</tr>
<tr>
<td>5</td>
<td>156.65</td>
</tr>
<tr>
<td>6</td>
<td>187.15</td>
</tr>
</tbody>
</table>

S.E./mean = 18.61 Rs./ac.
Crop :- Sesamum and Maize (Kharif).  
Ref :- I.A.R.I. 53(28). Type :- 'X'.

Object :- To study the effects of mixed cropping of Sesamum and Maize.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 17.6.1953. (iv) (a) 1 ploughing with victory plough, 1 with desi plough and one tractor discing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 weeding and 1 hoeing with hand hoe. (ix) N.A. (x) 22, 23, 26 to 28.9.1953.

2. TREATMENTS:
   1. Sesamum pure in lines.
   2. Maize pure in lines.
   3. Sesamum+Maize in separate rows (full rate).
   4. Sesamum+Maize in same row (full rate).
   5. Sesamum+Maize in separate rows (1 rate).
   6. Sesamum+Maize in same row (1 rate).

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of sesamum and maize. (iv) (a) 1952—1956. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

   RESULTS:
   (i) 165.48 Rs/ac.
   (ii) 51.60 Rs/ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. value in Rs/ac.
   Treatment | Av. value
   1. | 70.03
   2. | 189.28
   3. | 199.94
   4. | 155.97
   5. | 155.97
   6. | 192.21
   S.E./mean = 21.06 Rs/ac.

Crop :- Linseed, Wheat and Gram (Rabi).  
Ref :- I.A.R.I. 53(54). Type :- 'X'.

Object :- To find out suitable crop mixture of Wheat, Gram and Linseed.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 5.11.1953. (iv) (a) 1 ploughing with victory plough, twice tractor discing and preparing with desi plough. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Hoeing with oush plough and weeding. (ix) N.A. (x) 16, 17, 19.4.1954.

2. TREATMENTS:
   1. Linseed pure in lines.
   2. Wheat pure in lines.
   3. Gram pure in lines.
   4. Linseed+gram (2 : 1).
   5. Linseed+wheat (4 : 1).
   7. Linseed+gram (1 : 1).
   8. Linseed+wheat (1 : 1).

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40' x 18'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Yield of linseed, wheat and gram. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) to (iv) Av. yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>Significance</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linseed</td>
<td>1094</td>
<td>—</td>
<td>—</td>
<td>832</td>
<td>348</td>
<td>439</td>
<td>640</td>
<td>171</td>
<td>220</td>
<td>H.S.</td>
<td>85.58</td>
</tr>
<tr>
<td>Wheat</td>
<td>1972</td>
<td>—</td>
<td>—</td>
<td>1453</td>
<td>802</td>
<td>—</td>
<td>1478</td>
<td>1513</td>
<td>H.S.</td>
<td>151.40</td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>—</td>
<td>1445</td>
<td>N.A.</td>
<td>—</td>
<td>100</td>
<td>1089</td>
<td>—</td>
<td>325</td>
<td>H.S.</td>
<td>218.06</td>
<td></td>
</tr>
</tbody>
</table>

Crop : Wheat, Gram and Linseed (Rabi).

Object : To find out suitable crop mixture of Wheat, Gram and Linseed.

1. BASAL CONDITIONS:

(i) (a) No. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) 31.10.1952 and 1.11.1952.
(iv) (a) Ploughing with desi plough and tractor. (b) to (e) N.A. (v) Nil. (vi) and (vii) N.A. (viii) Bakhavig. (ix) N.A. (x) 4 to 30.4.1953.

2. TREATMENTS:

1. Linseed pure in lines.
2. Wheat pure in lines.
3. Gram pure in lines.
4. Linseed+gram (2:1)
5. Linseed+wheat (2:1).
7. Linseed+gram (1:1).
8. Linseed+wheat (1:1).

3. DESIGN:

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40’x18’. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) N.A. (iii) Yield of gram, linseed and wheat. (iv) (a) 1951—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) (vii) Nil.

5. RESULTS:

(i) to (iii) N.A.
(iv) Av. yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linseed</td>
<td>587</td>
<td>—</td>
<td>—</td>
<td>496</td>
<td>45</td>
<td>157</td>
<td>458</td>
<td>14</td>
<td>37</td>
</tr>
<tr>
<td>Wheat</td>
<td>—</td>
<td>3773</td>
<td>—</td>
<td>—</td>
<td>2885</td>
<td>2764</td>
<td>—</td>
<td>2961</td>
<td>2895</td>
</tr>
<tr>
<td>Gram</td>
<td>—</td>
<td>—</td>
<td>1213</td>
<td>457</td>
<td>—</td>
<td>76</td>
<td>795</td>
<td>—</td>
<td>133</td>
</tr>
</tbody>
</table>

Other details N.A.

Crop :-Paddy and Berseem.

Object : To study the relative merits of direct and indirect manuring of Paddy and Berseem with A/S and Super.

1. BASAL CONDITIONS:

(i) (a) No. (b) and (c) As per treatments. (ii) (a) and (b) Refer item 11 on page 143. (iii) 28.10.1950.
(iv) (a) Victory ploughing. (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) and (ix) N.A.
(x) 8, 9.1.1951, 12.2.1951 and 10.3.1951.

2. TREATMENTS:

All combinations of (1), (2) and (3).
(1) 2 crops : C1-Paddy and C2-Berseem.
(2) 3 levels of N as A/S : N0=0, N1=30 and N2=60 lb./ac.
(3) 3 levels of P2O5 as Super : P0=0, P1=80 and P2=160 lb./ac.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 51’x10’. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (b) 1948—N.A. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) Yield of treatment N\textsubscript{1}P\textsubscript{2} in Rep. IV is not available for Paddy and has been estimated by missing plot technique.

5. RESULTS:

<table>
<thead>
<tr>
<th>PADDY</th>
<th>BERSEEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>(i)</td>
</tr>
<tr>
<td>626 lb./ac.</td>
<td>663 lb./ac.</td>
</tr>
<tr>
<td>(ii)</td>
<td>(ii)</td>
</tr>
<tr>
<td>115.9 lb./ac.</td>
<td>89.72 lb./ac.</td>
</tr>
<tr>
<td>(iii) Only P effect is significant.</td>
<td>(iii) Only P effect is significant.</td>
</tr>
<tr>
<td>(iv) Av. yield of paddy in lb./ac.</td>
<td>(iv) Av. yield of berseem in lb./ac.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>P\textsubscript{1}</th>
<th>P\textsubscript{2}</th>
<th>Mean</th>
<th></th>
<th>P\textsubscript{1}</th>
<th>P\textsubscript{2}</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N\textsubscript{0}</td>
<td>555</td>
<td>641</td>
<td>725</td>
<td>640</td>
<td>N\textsubscript{0}</td>
<td>589</td>
<td>661</td>
</tr>
<tr>
<td>N\textsubscript{1}</td>
<td>589</td>
<td>676</td>
<td>676</td>
<td>647</td>
<td>N\textsubscript{1}</td>
<td>495</td>
<td>770</td>
</tr>
<tr>
<td>N\textsubscript{2}</td>
<td>520</td>
<td>623</td>
<td>622</td>
<td>589</td>
<td>N\textsubscript{2}</td>
<td>574</td>
<td>628</td>
</tr>
<tr>
<td>Mean</td>
<td>555</td>
<td>648</td>
<td>674</td>
<td>626</td>
<td>Mean</td>
<td>553</td>
<td>686</td>
</tr>
</tbody>
</table>

S.E. of N or P marginal mean (excluding N\textsubscript{0} and P\textsubscript{1}) = 33.5 lb./ac.
S.E. of body of table (excluding N\textsubscript{0}P\textsubscript{1} mean) = 57.9 lb./ac.

Crop: - wheat and peas (Rabi). Ref: I.A.R.I. 50(45). Type: - 'R'.

Object: - To test the economics of different Kharif and Rabi crop combinations as compared to green manuring.

1. BASAL CONDITIONS:

2. TREATMENTS:

Kharif
1. Maize
2. Fallow
3. Maize
4. Maize, with F.Y.M. at 1 ton/ac.
5. Maize
6. Sannhemp green manured at 60 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
7. Groundnut with 60 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
8. Sannhemp manured in alternate rows of Maize with 60 lb./ac. of P\textsubscript{2}O\textsubscript{5}.

Rabi
1. Fallow
2. Wheat
3. Wheat
4. Wheat
5. Peas
6. Sannhemp green manured at 60 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
7. Groundnut with 60 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
8. Sannhemp manured in alternate rows of Maize with 60 lb./ac. of P\textsubscript{2}O\textsubscript{5}.

3. DESIGN:
(i) R.B.D. (ii) (a), (b) N.A. (iii) R. (iv) (a) N.A. (b) 50' x 20'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Removal of smut-affected plants on 28.2.1951. (iii) Yield of grain and pod, etc. (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) N.A. (vii) Nil.

5. RESULTS:
Economics value
(i) 143.6 Rs./ac. (ii) 89.5 Rs./ac. (iii) Treatments differ significantly

Maize and Groundnut yield
(i) N.A. (ii) N.A. (iii) N.A.
Crop :- Wheat and Peas (Rabi).  Ref:- I.A.R.I. 51(38).  Type :- 'R'.

Object :- To study the economics of having different Kharif crops preceeding Wheat and Peas crops in the Rabi season.

1. BASAL CONDITIONS :
   (i) (a) As per treatments.  (b) Maize and sannhemp.  (c) As per treatments.  (ii) (a) and (b) Refer item 11 on page 143.  (iii) Peas on 2.11.1951 and wheat on 14 and 29.11.1951.  (iv) (a) Peas : victory ploughing, desi ploughing and planking on 24.10.1951, wheat : ploughing, desi ploughing and planking on 2, 3 and 4.10.1951 (b) to (e) N.A.  (v) Nil.  (vi) N.A.  (vii) Irrigated.  (viii) Weeding on 18.2.1952.  (ix) N.A.  (a) Peas on 21.3.1952 and wheat on 3, 24.4.1952 and 16.4.1952.

2. TREATMENTS :
   **Kharif 1951**
   1. Maize.
   2. Fallow.
   3. Maize.
   5. Maize.
   6. Sannhemp with 60 lb./ac. of P₂O₅.
   7. Groundnut with 60 lb./ac. of P₂O₅.
   8. Sannhemp manured with P₂O₅ in alternate rows of maize.

   **Rabi 1951**
   1. Maize.  Fallow
   2. Fallow.  Wheat
   3. Maize.  Wheat
   5. Maize.  Wheat
   6. Sannhemp with 60 lb./ac. of P₂O₅.
   7. Groundnut with 60 lb./ac. of P₂O₅.
   8. Sannhemp manured with P₂O₅ in alternate rows of maize.

3. DESIGN :
   (i) R.B.D.  (ii) (a) 8.  (b) N.A.  (iii) 6.  (iv) (a) 33' × 31', (b) 31' × 29'.  (v) 1' on each side.  (vi) Yes.

4. GENERAL:
   (i) Good.  Lodging occured.  (ii) N.A.  (iii) Yield of wheat grain.  (iv) (a) 1950—N.A.  (b) No.  (c) N.A.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS :
   (i) 1153 lb./ac.
   (ii) 241.9 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1462</td>
<td>1543</td>
</tr>
<tr>
<td>2.</td>
<td>832</td>
<td>1002</td>
</tr>
<tr>
<td>3.</td>
<td>865</td>
<td>1212</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>98.7 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

   (iv) Av. net income in Rs./ac.  (iv) Av. yield in lb./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. income</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>48.6</td>
<td>1.</td>
<td>850</td>
</tr>
<tr>
<td>2.</td>
<td>164.3</td>
<td>2.</td>
<td>—</td>
</tr>
<tr>
<td>3.</td>
<td>154.4</td>
<td>3.</td>
<td>771</td>
</tr>
<tr>
<td>4.</td>
<td>169.0</td>
<td>4.</td>
<td>1050</td>
</tr>
<tr>
<td>5.</td>
<td>130.5</td>
<td>5.</td>
<td>917</td>
</tr>
<tr>
<td>6.</td>
<td>214.0</td>
<td>6.</td>
<td>—</td>
</tr>
<tr>
<td>7.</td>
<td>85.2</td>
<td>7.</td>
<td>49.4</td>
</tr>
<tr>
<td>8.</td>
<td>182.6</td>
<td>8.</td>
<td>726</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>—31.64 Rs./ac.</td>
<td>S.E./mean</td>
<td>—N.A.</td>
</tr>
</tbody>
</table>

""

Object: To study the economics of different Kharif and Rabi crop combinations in comparison to green manured crop of Wheat.

1. BASAL CONDITIONS:

2. TREATMENTS:
   Kharif
   1. Maize.  
   2. Follow.  
   3. Maize.  
   5. Maize.  
   6. Sannhemp green manured at 60 lb./acre of P2O5.  
   7. Groundnut with 60 lb./acre of P2O5.  
   8. Sannhemp green manured at 60 lb./acre of P2O5 with alternate rows of maize.
   
   Follow
   
   Wheat
   
   Peas
   
   Economic value of different treatments:
   (i) 236.3 Rs./acre.  (ii) 79.2 Rs./acre.  (iii) Treatments differ significantly.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 33'x32'. (b) 31'x29'. (v) 1' around. (vi) Yes.

4. GENERAL:
   (i) Treatments 2, 6, 8, 4, 3 and 7 came in succession, best growth in 2. On the whole, lodging worked out is 40%. Crop of heavy growth has lodged extensively. (ii) Some ear heads were affected by smut. No pests. (iii) Grain yield.
   (iv) (a) 1950—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) and (vii) Nil.

5. RESULTS:
   Economic value
   (i) 236.3 Rs./acre.  (ii) 79.2 Rs./acre.  (iii) Treatments do not differ significantly.
   (iv) Av. net income in Rs./acre.

   Treatment  
   1. 152.6  
   2. 296.9  
   3. 307.7  
   4. 202.3  
   5. 238.4  
   6. 258.7  
   7. 167.6  
   8. 265.9  
   S.E./mean = 32.35 Rs./acre.

   Maize yield
   (i) 1233 lb./acre.  (ii) 695.6 lb./acre.  (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./acre.

   Treatment  
   1. 1405  
   2. 1464  
   3. 1210  
   4. 1152  
   5.  —  
   6.  —  
   7.  —  
   8.  933  
   S.E./mean = 283.9 lb./acre.


Object: To study the economics of different Kharif and Rabi crop combinations as compared to green manuring.

1. BASAL CONDITIONS:
   (i) (a), (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Kharif crops on 4.7.1952 and 23, 24.10.1952. (iv) (a) Ploughing with victory plough once; ploughing with desi plough twice. Preparing land with desi plough twice after soaking dose. (b) to (e) N.A. (v) N.A. (vi) Wheat : N.P. 4 and Peas : N.P. 29. (vii) Irrigated. (viii) One weeding and thinning for Kharif crops, hoeing for peas and weeding for wheat. (ix) N.A. (a) Maize and Groundnut on 6, 9.10.1952 and Sannhemp buried on 18.8.1952, Peas on 11.3.1953 and Wheat on 19.3.1953.
2. TREATMENTS:

Kharif
1. Maize
2. Fallow
3. Maize
4. Maize +10 ton/acre of F.Y.M.
5. Maize
6. Sannhemp (G.M.)
7. Mung
8. Maize+Sannhemp, in alternate rows, G.M.

Rabi
Follow
Wheat
Wheat
Wheat
Peas
Wheat
Wheat

3. DESIGN:

(i) R.B.D. (ii) 8 (b) N.A. (iii) 6. (iv) (a) 33’x31’ (b) 31’x29’. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) Disease observed in Moong crop. The plants turned black and died. (iii) Grain yield. (iv) 1950—N.A. (b) No. (c) N.A. (v) (a), (b) No. (vi) N.A. (vii) Raw data N.A. Results are available as given under item 5.

5. RESULTS:

Kharif crops

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1145 (Maize)</td>
</tr>
<tr>
<td>2.</td>
<td>—</td>
</tr>
<tr>
<td>3.</td>
<td>1179 (Maize)</td>
</tr>
<tr>
<td>4.</td>
<td>1285 (Maize)</td>
</tr>
<tr>
<td>5.</td>
<td>1285 (Maize)</td>
</tr>
<tr>
<td>6.</td>
<td>16223 (Maize)</td>
</tr>
<tr>
<td>7.</td>
<td>—</td>
</tr>
<tr>
<td>8.</td>
<td>1067 (Maize)</td>
</tr>
</tbody>
</table>

Rabi crops

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>—</td>
</tr>
<tr>
<td>2.</td>
<td>1421 (Wheat)</td>
</tr>
<tr>
<td>3.</td>
<td>942 (Wheat)</td>
</tr>
<tr>
<td>4.</td>
<td>1169 (Wheat)</td>
</tr>
<tr>
<td>5.</td>
<td>1799 (Peas)</td>
</tr>
<tr>
<td>6.</td>
<td>1227</td>
</tr>
<tr>
<td>7.</td>
<td>1164</td>
</tr>
<tr>
<td>8.</td>
<td>805</td>
</tr>
</tbody>
</table>

Crop :- As under treatments. Ref :- I.A.R.I. 53(43). Type :- 'R'.

Object :- To study the economics of different Kharif and Rabi crop combinations as compared to F.Y.M.

1. BASAL CONDITIONS:

(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Kharif crops : 26, 27.6.1953. Rabi crops : on 27.10.1953. (iv) (a) Ploughed with the victory plough ; Preparing land with desi plough twice and beaming. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing on 27.7.1953 and 1 weeding on 20, 21, 8.1953, 1 weeding on 26, 27.12.1953 for wheat and peas, (ix) N.A. (x) Maize on 1, 2.10.1953, Sannhemp on 5.8.1953, Peas on 16.3.1953 and Wheat on 1.4.1954.

2. TREATMENTS:

Kharif crops

<table>
<thead>
<tr>
<th>Treatment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Maize</td>
</tr>
<tr>
<td>2.</td>
<td>Fallow</td>
</tr>
<tr>
<td>3.</td>
<td>Maize</td>
</tr>
<tr>
<td>4.</td>
<td>Maize +10 ton/acre of F.Y.M.</td>
</tr>
<tr>
<td>5.</td>
<td>Maize</td>
</tr>
<tr>
<td>6.</td>
<td>Sannhemp G.M.</td>
</tr>
<tr>
<td>7.</td>
<td>Soyabean</td>
</tr>
<tr>
<td>8.</td>
<td>Maize+Sannhemp, in alternate rows, G.M.</td>
</tr>
</tbody>
</table>

Rabi crops

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow</td>
</tr>
<tr>
<td>Wheat</td>
</tr>
<tr>
<td>Wheat</td>
</tr>
<tr>
<td>Peas</td>
</tr>
<tr>
<td>Wheat</td>
</tr>
<tr>
<td>Wheat</td>
</tr>
</tbody>
</table>

3. DESIGN:

(i) R.B.D. (ii) 8 (b) N.A. (iii) 6. (iv) (a) N.A. (b) 31’x29’. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Yield of grain and fodder. (iv) 1950—N.A. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:

(i) 347.9 Rs./ac.
(ii) 39.8 Rs./ac.
(iii) Treatments differ highly significantly.
(iv) Av. net income in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>220.9</td>
</tr>
<tr>
<td>2.</td>
<td>270.0</td>
</tr>
<tr>
<td>3.</td>
<td>400.1</td>
</tr>
<tr>
<td>4.</td>
<td>491.4</td>
</tr>
<tr>
<td>5.</td>
<td>424.2</td>
</tr>
<tr>
<td>6.</td>
<td>379.2</td>
</tr>
<tr>
<td>7.</td>
<td>192.0</td>
</tr>
<tr>
<td>8.</td>
<td>405.1</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>16.26 Rs./ac.</td>
</tr>
</tbody>
</table>


Object: To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS:


2. TREATMENTS:

<table>
<thead>
<tr>
<th>Khairf I</th>
<th>Rabl I</th>
<th>Khairf II</th>
<th>Rabl II</th>
<th>Khairf III</th>
<th>Rabl III</th>
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<tbody>
<tr>
<td>A</td>
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<td>Wheat</td>
<td>Fallow</td>
<td>Wheat</td>
</tr>
<tr>
<td>B</td>
<td>Sannhemp</td>
<td>Potato</td>
<td>Maize</td>
<td>Peas</td>
<td>Peas</td>
</tr>
<tr>
<td>C</td>
<td>Cotton</td>
<td>Berseem</td>
<td>Wheat</td>
<td>Cotton</td>
<td>Berseem</td>
</tr>
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<td>D</td>
<td>Maize</td>
<td>Cowpeas</td>
<td>Wheat</td>
<td>Sugarcane</td>
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</tr>
<tr>
<td>E</td>
<td>Maize</td>
<td>Potato</td>
<td>Sugarcane</td>
<td>Peas</td>
<td>Peas</td>
</tr>
<tr>
<td>F</td>
<td>Sannhemp</td>
<td>Wheat</td>
<td>Maize</td>
<td>Peas</td>
<td>Peas</td>
</tr>
<tr>
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<td>Fallow</td>
<td>Wheat</td>
<td>Fallow</td>
<td>Peas</td>
<td>Peas</td>
</tr>
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<td>H</td>
<td>Fallow</td>
<td>Wheat</td>
<td>Fallow</td>
<td>Sugarcane</td>
<td>Sugarcane</td>
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<tr>
<td>I</td>
<td>Cowpeas</td>
<td>Wheat</td>
<td>Fallow</td>
<td>Peas</td>
<td>Peas</td>
</tr>
<tr>
<td>J</td>
<td>Sannhemp</td>
<td>Wheat</td>
<td>Fallow</td>
<td>Potato</td>
<td>Sugarcane</td>
</tr>
</tbody>
</table>

3. DESIGN:

(i) R.B.D. (ii) (a) and (b) N.A. (iii) 4. (iv) (a) 41' x 61'. (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Yield of wheat grain, peas, potato and berseem fodder. (iv) 1951—1956. (b) Yes. (c) N.A. (v) (a) and (b) No. (vi) Nil. (vii) The results as available are given.

5. RESULTS:

<table>
<thead>
<tr>
<th>WHEAT</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tbody>
<tr>
<td>A_1</td>
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<tr>
<td>A_2</td>
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<tr>
<td>C_2</td>
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<tr>
<td>D_2</td>
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<td>F_2</td>
<td>566</td>
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</tr>
<tr>
<td>G_2</td>
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<td></td>
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<tr>
<td>H_2</td>
<td>629</td>
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<tr>
<td>J_1</td>
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<td>J_1</td>
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<table>
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<tbody>
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<tr>
<td>I_4</td>
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</tr>
<tr>
<td>B_1</td>
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<td>E_1</td>
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<td>J_3</td>
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<tr>
<td>G_4</td>
<td>703</td>
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<tr>
<td>I_5</td>
<td>586</td>
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</table>

MAIZE yield

(i) N.A. (l) to (iii) N.A.
(iv) Av. yield of maize in lb./ac.
Crop: Cowpeas, Sugarcane and Cotton (Kharif).

Object: To find out suitable rotation for Delhi tract.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Cotton:—21.4.53, Maize, Cowpeas—29 and 30.5.53, Sannhemp—18.6.53, Maize 28.6.53 and Sugarcane—7, 10.5.53. (iv) (a) Cotton:—Ploughing with victory plough once, with desi thrice preparing level with desi plough. Maize and Cowpeas:—Beaming after soaking dose, ploughing twice, preparing land with desi plough after soaking dose. Sannhemp:—Preparing land with desi plough twice after soaking dose. Maize—Victory ploughing once, desi twice preparing land with desi plough twice and beaming. Sugarcane—Preparing land with desi plough thrice and beaming. (b) to (e) N.A. (v) Cotton—1400 lb. of F.Y.M./plot, Maize and Cowpeas—G.N.C. at 400 lb./ac. + 20 lb./ac. of N as C/N and 10 lb./ac. N on 28.6.53. Sannhemp—700 lb./ac. of F.Y.M./plot and 63 lb./ac of Ammon. Phos. at sowing time. Maize—700 lb./ac. F.Y.M. per plot. Sugarcane—1400 lb./ac. of F.Y.M. (vi) Nil. (vii) Irrigated. (viii) Cotton:—Hoeing, interculturing with desi plough.

2. TREATMENTS to 4. GENERAL:
   Please refer to No. I.A.R.I. 51(22) on page 345.

5. RESULTS:

MAIZE
   (i) 1692 Ib./ac.
   (ii) 243.6 lb./ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of grain in Ib./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>B4</td>
<td>1925</td>
</tr>
<tr>
<td>E1</td>
<td>1628</td>
</tr>
<tr>
<td>F2</td>
<td>1318</td>
</tr>
<tr>
<td>I3</td>
<td>1999</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>121.8 lb./ac.</td>
</tr>
</tbody>
</table>

MAIZE and COWPEAS
   (i) 25576 lb./ac.
   (ii) 16110 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>24429</td>
</tr>
<tr>
<td>D1</td>
<td>27302</td>
</tr>
<tr>
<td>I1</td>
<td>24998</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>8034.9 lb./ac.</td>
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</tbody>
</table>

SUGARCANE
   (i) 74256 lb./ac.
   (ii) 116110 lb./ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of sugarcane in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>B4</td>
<td>72845</td>
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<tr>
<td>H4</td>
<td>69717</td>
</tr>
<tr>
<td>J4</td>
<td>80206</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>4833.9 lb./ac.</td>
</tr>
</tbody>
</table>

COTTON
   (i) 1376 lb./ac.
   (ii) 669.8 lb./ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of kapaa in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>1220</td>
</tr>
<tr>
<td>D2</td>
<td>1517</td>
</tr>
<tr>
<td>G3</td>
<td>1461</td>
</tr>
<tr>
<td>H4</td>
<td>1306</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>354.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat-Peas-Potato-Berseem (Rabi).

Object: To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Peas on 18, 20.10.1952, Wheat on 26, 30.10.1952, Potato on 17.10.1952 and Berseem on 8.10.1952. (iv) (a) Peas:—Ploughing with victory plough once, 5 times with desi plough. Wheat: ploughing with victory plough once, desi plough twice, preparing land with desi plough. Potato:—ploughing with victory plough once, desi twice, preparing land with desi plough thrice and Berseem:—preparing land with victory plough once and preparing land with desi plough twice except in cotton plots. (b) to (e) N.A. (v) N.A. (vi) Potato: D.R.R. Wheat: N.P. 775 and Peas: N.P. 29. (vii) Irrigated. (viii) Peas:—Bakharving once, Wheat:—weeding and Potato—hoewing. (ix) N.A. (a) Peas on 12, 14.3.1953, Wheat on 23, 24.3.1953, Potato on 24.2.1953 and 2.3.1953 and Berseem on 13.12.1952 to N.A.
2. TREATMENTS to 4. GENERAL:

Please refer to No. I.A.R.I. 51(22) on page 345.

5. RESULTS:

### WHEAT

<table>
<thead>
<tr>
<th>Treatment</th>
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<tbody>
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<td>A₁</td>
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<td>A₂</td>
<td>1612</td>
</tr>
<tr>
<td>C₂</td>
<td>2220</td>
</tr>
<tr>
<td>D₂</td>
<td>1891</td>
</tr>
<tr>
<td>F₁</td>
<td>2249</td>
</tr>
<tr>
<td>G₁</td>
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<tr>
<td>H₁</td>
<td>1889</td>
</tr>
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<td>J₁</td>
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Permanent plot 1807

### POTATO

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<td>B₁</td>
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<tr>
<td>B₂</td>
<td>20896</td>
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<tr>
<td>J₁</td>
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### BERSEEM

<table>
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<tr>
<td>C₁</td>
<td>39399</td>
</tr>
<tr>
<td>D₂</td>
<td>44475</td>
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<tr>
<td>I₁</td>
<td>63664</td>
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### PEAS

<table>
<thead>
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<tbody>
<tr>
<td>B₁</td>
<td>1212</td>
</tr>
<tr>
<td>F₁</td>
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</tr>
<tr>
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<td>1275</td>
</tr>
<tr>
<td>I₁</td>
<td>1165</td>
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Object:—To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS:


2. TREATMENTS to 4. GENERAL.

Please refer to No. I.A.R.I. 51(22) on page 345.

5. RESULTS:

### WHEAT

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
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</thead>
<tbody>
<tr>
<td>(i) 1979</td>
<td>lb./ac.</td>
</tr>
<tr>
<td>(ii) 174.46</td>
<td>lb./ac.</td>
</tr>
<tr>
<td>(iii) Treatments differ highly significantly.</td>
<td></td>
</tr>
<tr>
<td>(iv) Av. yield of grain in lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
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<tbody>
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<tr>
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<td>1678</td>
</tr>
<tr>
<td>C₂</td>
<td>2131</td>
</tr>
<tr>
<td>D₂</td>
<td>2024</td>
</tr>
<tr>
<td>F₁</td>
<td>1967</td>
</tr>
<tr>
<td>G₁</td>
<td>2172</td>
</tr>
<tr>
<td>H₁</td>
<td>2107</td>
</tr>
<tr>
<td>I₁</td>
<td>2000</td>
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<tr>
<td>J₁</td>
<td>2065</td>
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<td>S.E./mean</td>
<td>= 87.39 lb./ac.</td>
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### POTATO

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<th>Av. yield</th>
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<tr>
<td>(i) 14020</td>
<td>lb./ac.</td>
</tr>
<tr>
<td>(ii) 1685.2</td>
<td>lb./ac.</td>
</tr>
<tr>
<td>(iii) Treatments do not differ significantly.</td>
<td></td>
</tr>
<tr>
<td>(iv) Av. yield of potato in lb./ac.</td>
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</tr>
<tr>
<td>J₁</td>
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<tr>
<td>S.E./mean</td>
<td>= 842.6 lb./ac.</td>
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### BERSEEM

<table>
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<tr>
<td>C₂</td>
<td>39526</td>
</tr>
<tr>
<td>C₃</td>
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### PEAS

<table>
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<td>1462</td>
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<tr>
<td>I₁</td>
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</table>
Crop :- Maize-Cotton-Cowpeas-Sugarcane (Kharif).

Object :- To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS:
   (i) (a) As per treatments. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) N.A.
   (iv) (a) to (e) N.A. (v) to (a) N.A.

2. TREATMENTS to 4. GENERAL:
   Please refer to No. I.A.R.I. 51(22) on page 345.

5. RESULTS:
   (i) to (iii) N.A.
   (iv) Av. yield in lb./ac.

<table>
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<td>Av. yield</td>
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<td></td>
</tr>
<tr>
<td>B2</td>
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<td>C2</td>
</tr>
<tr>
<td>E2</td>
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<table>
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<tr>
<td>J5</td>
<td>50137</td>
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<td>40120</td>
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</table>

Crop :- Maize-Cotton-Cowpeas (Kharif).

Object :- To find out a suitable rotation for Delhi tract.

1. BASAL CONDITIONS:
   (i) (a) As per treatments. (b) and (c) N.A. (ii) (a) and (b) Refer item 11 on page 143. (iii) Maize and cowpeas : 31.5.52 ; cotton 21.4.1952 and 20.5.1952. Maize 27.6.1952 and G.M. 13.6.1952. (iv) (a) Ploughing with victory plough and desi plough, preparing land with desi plough twice after soaking dose. (b) to (e) N.A. (v) F.Y.M. at 5 ton/ac. C/N at 20 lb./ac. of N on 31.5.1952. (vi) N.A. (vii) Irrigated. (viii) Hoeing with oudh plough on 14 and 25.6.52. (ix) N.A. (x) 9.8.52 to 12.8.52.

2. TREATMENTS to 4. GENERAL:
   Please refer to No. I.A.R.I. 51(22) on page 345.

5. RESULTS:
   (i) to (iii) N.A.
   (iv) Av. yield in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>MAIZE</th>
<th>COTTON</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Av. yield</td>
<td>Av. yield</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td>1699</td>
<td>C2</td>
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<td>1448</td>
<td>D2</td>
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<td>F2</td>
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