INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS

NATIONAL INDEX

OF

AGRICULTURAL

FIELD

EXPERIMENTS

VOL. 4 PART

GUJARAT

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 upto 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 wholehearted co-operation of the States and other organisations in making available the results of their experimental researches for this purpose. My thanks are due to the officers of the State Departments of Agriculture and other institutions for participating in this work. I hope that the present series will be followed by periodical 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.

NEW DELHI,
August 20, 1962.

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

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

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

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

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

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

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

V.G. PANSE
Statistical Adviser,

NEW DELHI,
March 25, 1965.
REGIONAL SUPERVISORS AND REGIONAL STAFF FOR THE NATIONAL INDEX OF FIELD EXPERIMENTS

<table>
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<td>1. Andhra Pradesh</td>
<td>S.K. Julani / P.R. Yeri</td>
<td>Dr. Mohd. Quadruddin Khan, Joint Director of Agricultural.</td>
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<tr>
<td>(Hyderabad)</td>
<td></td>
<td>Late Dr. Syed Waheeduddin.</td>
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<tr>
<td></td>
<td></td>
<td>Shri Md. Khasim Adoni, Joint Director of Extension.</td>
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<td></td>
<td></td>
<td>Shri N.V. Mohana Rao, Joint Director, Agricultural Research Institute, Rajendranagar.</td>
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<td></td>
<td>Shri L. Venkataramnam, Deputy Director of Agriculture (Research).</td>
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<tr>
<td>(Poona)</td>
<td></td>
<td>Shri J.B. Trivedi, Deputy Director of Agriculture (Statistics).</td>
</tr>
<tr>
<td>(Ahmedabad)</td>
<td></td>
<td>Shri Mohinder Singh Pannu, Statistician, Department of Agriculture.</td>
</tr>
<tr>
<td>4. Uttar Pradesh</td>
<td>S.N. Bajpai / M.S. Batra / A.C. Khare</td>
<td>Shri G.P. Singh, Statistician, Department of Agriculture.</td>
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<tr>
<td>(Lucknow)</td>
<td></td>
<td>Shri R.S. Roy, Principal, Agricultural Research Institute, Sabour.</td>
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<tr>
<td></td>
<td></td>
<td>Shri H.C. Kohari, Statistician, Department of Agriculture,</td>
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<td>5. Madhya Pradesh</td>
<td>T. Lokeshwara Rao / H.C. Gupta</td>
<td>Shri R.P. Misra, Deputy Director of Agriculture (Hq.), Deputy Director of Agriculture (Hq.).</td>
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<tr>
<td>(Chandigarh)</td>
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<td>Shri H.C. Misra, Principal, Uttakal Krushi Mahavidyalaya, Bhubaneswar.</td>
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<td>&amp; Himachal Pradesh</td>
<td></td>
<td>Shri R.P. Misra, Deputy Director of Agriculture (Hq.).</td>
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<tr>
<td></td>
<td></td>
<td>Shri M.C. Misra, Principal, Uttakal Krushi Mahavidyalaya, Bhubaneswar.</td>
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<tr>
<td>(Sabour)</td>
<td></td>
<td>Shri R.P. Misra, Deputy Director of Agriculture (Hq.).</td>
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<td>B.P. Dyundi / N.K. Ohri</td>
<td>Shri M.C. Misra, Principal, Uttakal Krushi Mahavidyalaya, Bhubaneswar.</td>
</tr>
<tr>
<td>(Jaipur)</td>
<td></td>
<td>Shri S.N. Mukerjee, Statistical Officer, Directorate of Agriculture.</td>
</tr>
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<td>9. Orissa</td>
<td>L.B.S. Somayazulu</td>
<td>Shri R.P. Misra, Deputy Director of Agriculture (Hq.).</td>
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<tr>
<td>(Bhubaneswar)</td>
<td></td>
<td>Shri M.C. Misra, Principal, Uttakal Krushi Mahavidyalaya, Bhubaneswar.</td>
</tr>
<tr>
<td>10. West Bengal</td>
<td>S.N. Nath</td>
<td>Shri S.N. Mukerjee, Statistical Officer, Directorate of Agriculture.</td>
</tr>
<tr>
<td>(Calcutta)</td>
<td></td>
<td>Shri R.P. Misra, Deputy Director of Agriculture (Hq.).</td>
</tr>
</tbody>
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11. MADRAS (COIMBATORE)  
P. Prabhakara Rao  
V. Venkateswara Rao  
Vice-Principal and Secretary, Research Council, Agricultural College and Research Institute, Coimbatore.

SHRI T. NATARAJAN,  
Agronomist.

SHRI A.H. SARMA,  
Extension Specialist.

SHRI V. RAMAN,  
Secretary, Research Council.

SHRI K.R. NAGARAJA Rao,  
Secretary, Research Council.

12. ASSAM  
T.K. GUPTA  
Dr. S.R. Barooha,  
Director of Agriculture, Assam.

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

13. MYSAORE (BANGALORE)  
K.A. Balakrishnan  
SHRI M.A. Wali,  
Director of Statistics,

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

14. KERALA (TRIVANDRUM)  
V.N. Iyer  
SHRI M. JANARDANAN NAIR,  
Director of Agriculture.

SHRI N. SHANKARA MENON  
Director of Agriculture.

SHRI P.D. NAIR,  
Director of Agriculture.
ABBREVIATIONS COMMON TO EXPERIMENTS ON ANNUAL AND PERENNIAL CROPS AND EXPERIMENTS ON CULTIVATORS' FIELDS.

Crops: In the top left corner is given the name of the crop on which the experiment is conducted. Within brackets along side the crop is mentioned the season 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:

2. As.—Assam 10. Mh.—Maharashtra
3. Bh.—Bihar 11. Ms.—Mysore
4. Gj.—Gujarat 12. Or.—Orissa
5. H.P.—Himachal Pradesh 13. Pb.—Punjab
7. K.—Kerala 15. U.P.—Uttar Pradesh

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

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

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

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

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

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

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

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

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

Other abbreviations used in the text of experiments:

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

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

DETAILS OF EXPERIMENTAL STATIONS

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

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

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

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

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

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

BASAL CONDITIONS

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

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

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

A. For experiments on annual crops:

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

B. For experiments on perennial crops:

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

C. For experiments on cultivators' fields:

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

GENERAL

A. For experiments on annual crops:

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

B. For experiments on perennial crops:

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

C. For experiments on cultivators' fields:

(i) Crop condition during growth. (ii) Incidence of pests and diseases with control measures taken. (iii) Quantitative observations taken. (iv) In case of repetition in successive years, (a) from what year to what year, (b) whether treatments were assigned to the same plots in the same manner every year, (c) reference to combined analysis, if any. (v) In case of repetition in other places names of places along with reference. (vi) Abnormal occurrences, like heavy rains, frost, storm etc., if any. (vii) Any other important information.
<table>
<thead>
<tr>
<th>Unit</th>
<th>Metric Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 foot</td>
<td>304.8 mm.</td>
</tr>
<tr>
<td>1 acre</td>
<td>0.0404606 hectare.</td>
</tr>
<tr>
<td>1 gram</td>
<td>0.035274 ounce = 0.085735 tola = 0.017147 chatak</td>
</tr>
<tr>
<td>1 kg.</td>
<td>2.20462 pounds = 1.01609 seers.</td>
</tr>
<tr>
<td>1 metric tone</td>
<td>0.9842 ton = 26.7923 maunds.</td>
</tr>
<tr>
<td>1 maund</td>
<td>0.373242 quintal = 37.3242 kg.</td>
</tr>
<tr>
<td>1 lb./ac.</td>
<td>1.12085 kg./hectare.</td>
</tr>
<tr>
<td>1 md./ac.</td>
<td>92.23002 kg./hectare = 0.9223 quintal/hectare.</td>
</tr>
<tr>
<td>1 ton/ac.</td>
<td>2.51071 metric tones/hectare.</td>
</tr>
<tr>
<td>1 gallon (Imp.)</td>
<td>4.54596 litres.</td>
</tr>
<tr>
<td>Sl. No.</td>
<td>Name of Crop</td>
</tr>
<tr>
<td>-------</td>
<td>--------------</td>
</tr>
<tr>
<td>1.</td>
<td>Paddy</td>
</tr>
<tr>
<td>2.</td>
<td>Wheat</td>
</tr>
<tr>
<td>3.</td>
<td>Sorghum (Great millet)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Nagli (Finger millet)</td>
</tr>
<tr>
<td>7.</td>
<td>Chinamug (Green gram)</td>
</tr>
<tr>
<td>8.</td>
<td>Gram ; Bengal gram</td>
</tr>
<tr>
<td>9.</td>
<td>Sugarcane</td>
</tr>
<tr>
<td>11.</td>
<td>Groundnut</td>
</tr>
<tr>
<td>12.</td>
<td>Lang (Chickling vetch)</td>
</tr>
<tr>
<td>13.</td>
<td>Garlic</td>
</tr>
<tr>
<td>14.</td>
<td>Tobacco</td>
</tr>
<tr>
<td>15.</td>
<td>Lucerne</td>
</tr>
<tr>
<td>16.</td>
<td>Chiku (Sapota)</td>
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<tr>
<td>Wheat</td>
<td>39</td>
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<td>Jowar</td>
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<td>Groundnut</td>
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<td>Lang</td>
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GUJARAT

The State of Gujarat lies along the western coast of India and is bounded by Rajasthan and West Pakistan on the north, Madhya Pradesh on the east, Maharashtra on the south and Arabian sea on the west. Administratively the state has been divided into 18 districts. The state has an area of 71056 sq. miles or 45.5 million acres. Area according to village papers is 45.3 million acres. The statistics on the land utilization in this state are given in the Table 1 below:

<table>
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<tr>
<th>Statistics</th>
<th>Acres</th>
</tr>
</thead>
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<tr>
<td>Total geographical area as per village papers</td>
<td>45259</td>
</tr>
<tr>
<td>Forest</td>
<td>2743</td>
</tr>
<tr>
<td>Barren and unculturable land</td>
<td>11423</td>
</tr>
<tr>
<td>Land put to non-agricultural uses</td>
<td>1234</td>
</tr>
<tr>
<td>Culturable waste</td>
<td>1797</td>
</tr>
<tr>
<td>Permanent pastures and other grazing land</td>
<td>2551</td>
</tr>
<tr>
<td>Land under misc. tree crops</td>
<td>111</td>
</tr>
<tr>
<td>Current fallows</td>
<td>907</td>
</tr>
<tr>
<td>Other fallow land</td>
<td>861</td>
</tr>
<tr>
<td>Net area sown</td>
<td>23632</td>
</tr>
<tr>
<td>Area sown more than once</td>
<td>1393</td>
</tr>
<tr>
<td>Total cropped area</td>
<td>25025</td>
</tr>
</tbody>
</table>

1. **Agro-climatic Regions**

The climate of Gujarat in the south and south-west is mostly moist with an average rain fall of about 1500 mm. while the north-eastern portion is dry approaching that of southern Rajasthan with a rain fall of about 500 mm. The temperatures are also higher in the northern area and lowest in the southern districts. The maximum temperature varies from 36.7°C to 43.3°C during summer. During winter, November to February minimum temperature varies from 2°C to 18.3°C and maximum from 21.1°C to 37.8°C. Rainy season in the southern portion lasts from July to October and is hot and moist. The soils of Gujarat State are mostly of black type varying from shallow to deep black, sandy loam (Gorat or Goradu) and of coastal alluvium. The last two types of soils are observed along the coastal area and also in the northern portion comprising river alluvium. The soils in many parts of the state are of black type. From the point of view of soil type and climatic conditions prevailing in the State, Gujarat can be divided into 5 distinct agro-climatic regions which are briefly described below:

1. **Southern Region**:
   - This region comprises the area south of the river Narmada and covers the districts of Broach, Surat, Bulsar and the Dangs. The soils in most of Broach and Surat districts are deep black cotton from the trap and vary from clay to clay-loam in nature. A strip of coastal alluvium about 10 to 15 miles wide is also found along the coast of Surat and Broach districts. Most of the Dangs district is covered by the hilly areas. The rainfall varies from 1016 to 1524 mm.

2. **Middle Region**:
   - The area lying between the rivers Sabarmati and Narmada forms the middle region and constitutes the districts of Baroda, Panch Mahals, Sabarkantha, Kaira, parts of Broach district north of river Narmada and parts of Ahmedabad district lying east of river Sabarmati. The soils in this region are mostly sandy to sandy loam and in the valleys of Panch Mahals district the soils are dark coloured loam fairly deep and fertile locally known as *besar*.

3. **Northern Region**:
   - The area lying west of the river Sabarmati and comprising the districts of Ahmedabad, Banaskantha and Mehsana constitutes the northern region. The
soils vary from sandy to sandy loam locally known as gorat or gorudu. The alluvial gorudu soil of the Indo-Gangetic type found in Ahmedabad district is very deep, grey to light brown in colour. These soils respond well to irrigation and manuring. The rainfall in the region varies from 281 to 762 mm. There is wide variation in temperature ranging from 4.4°C to 46.1°C.

4. Saurashtra Region:—This region comprises of Surendra Nagar, Rajkot, Jamnagar, Junagadh, Amreli and Bhavnagar districts. The rainfall varies from 457 to 889 mm. The soils are mostly medium black and shallow light except in Junagadh area.

5. Kutch Region:—The soils of Kutch are of sandy loam type. The rainfall varies from 254 to 457 mm.

2. Irrigation

The State has nearly 1.85 million acres irrigated. The area irrigated by different sources is given in the Table 2 below:

<table>
<thead>
<tr>
<th>Source</th>
<th>Area in '000 acres</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government canals</td>
<td>229</td>
<td>12.3</td>
</tr>
<tr>
<td>Private canals</td>
<td>32</td>
<td>1.7</td>
</tr>
<tr>
<td>Tanks</td>
<td>44</td>
<td>2.4</td>
</tr>
<tr>
<td>Wells</td>
<td>1459</td>
<td>78.7</td>
</tr>
<tr>
<td>Other sources</td>
<td>90</td>
<td>4.9</td>
</tr>
<tr>
<td>Net area irrigated</td>
<td>1854</td>
<td>100.0</td>
</tr>
<tr>
<td>Area irrigated more than once</td>
<td>96</td>
<td></td>
</tr>
</tbody>
</table>

3. Agricultural Production and Normal Cropping Pattern

Bajra, paddy, jowar, wheat, cotton and groundnut are the principal crops of the State. Paddy, cotton and jowar are the major crops of the Southern Region. In addition to the above crops, bajra, tobacco and groundnut are also grown in the districts comprising the Middle Region. The major crops of the Northern Region and the Saurashtra and Kutch Regions are bajra, jowar, cotton and groundnut. Wheat is also grown extensively in the Northern and the Saurashtra regions. The area production and the average yield per acre of principal crops of the state are given in the Table 3 below:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Area in '000 acres</th>
<th>Production in '000 tons</th>
<th>Yield in lb./acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>1284</td>
<td>477</td>
<td>832</td>
</tr>
<tr>
<td>Wheat</td>
<td>1028</td>
<td>361</td>
<td>786</td>
</tr>
<tr>
<td>Jowar</td>
<td>3324</td>
<td>402</td>
<td>621</td>
</tr>
<tr>
<td>Bajra</td>
<td>2951</td>
<td>640</td>
<td>486</td>
</tr>
<tr>
<td>Maize</td>
<td>551</td>
<td>236</td>
<td>957</td>
</tr>
<tr>
<td>Other cereals</td>
<td>333</td>
<td>116</td>
<td>980</td>
</tr>
<tr>
<td>Gram</td>
<td>252</td>
<td>54</td>
<td>480</td>
</tr>
<tr>
<td>Tur</td>
<td>207</td>
<td>45</td>
<td>492</td>
</tr>
<tr>
<td>Other Pulses</td>
<td>870</td>
<td>96</td>
<td>247</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>55</td>
<td>1318</td>
<td>23.96*</td>
</tr>
<tr>
<td>Groundnut</td>
<td>4560</td>
<td>1251</td>
<td>614</td>
</tr>
<tr>
<td>Castor</td>
<td>162</td>
<td>19</td>
<td>263</td>
</tr>
<tr>
<td>Sesamum</td>
<td>253</td>
<td>21</td>
<td>187</td>
</tr>
<tr>
<td>Cotton</td>
<td>4169</td>
<td>1316**</td>
<td>124</td>
</tr>
<tr>
<td>Tobacco</td>
<td>188</td>
<td>69</td>
<td>825</td>
</tr>
</tbody>
</table>

* In tons
** Cotton lint in bales of 392 lb. each.
5. Agricultural Experimentation

Agricultural experimentation in Gujarat State increased considerably during the period 1954-59 as compared to the preceding five years. There are now 31 agricultural research farms reporting experiments on different agronomic aspects as compared to 17 during the period 1948-53. The research stations at Amreli, Halvad, Junagadh, Surat and Umrala are the principal agricultural research stations in the State accounting for more than 50 percent of the total number of experiments reported for this period. There were in all 631 experiments reported for the period 1954-59 conducted in the State. The distribution of these experiments according to crops and types of treatments tried is given in the Table 4 below:

<table>
<thead>
<tr>
<th>Crop</th>
<th>M</th>
<th>MV</th>
<th>C</th>
<th>CV</th>
<th>CM</th>
<th>CMV</th>
<th>I+1M+IV</th>
<th>IC+ICM</th>
<th>D+DM</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paddy</td>
<td>24</td>
<td>1</td>
<td>11</td>
<td>1</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>57</td>
</tr>
<tr>
<td>Wheat</td>
<td>50</td>
<td>3</td>
<td>41</td>
<td>1</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td>123</td>
</tr>
<tr>
<td>Jowar</td>
<td>25</td>
<td>3</td>
<td>15</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>Bajra</td>
<td>29</td>
<td>1</td>
<td>22</td>
<td>21</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>74</td>
</tr>
<tr>
<td>Nagli</td>
<td>3</td>
<td>-</td>
<td></td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Banti</td>
<td>2</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Chanaamug</td>
<td>8</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Gram.</td>
<td>11</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>Legume</td>
<td>5</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>9</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>Cotton</td>
<td>33</td>
<td>-</td>
<td>12</td>
<td>1</td>
<td>25</td>
<td>10</td>
<td>2</td>
<td>4</td>
<td></td>
<td>87</td>
</tr>
<tr>
<td>Groundnut</td>
<td>19</td>
<td>1</td>
<td>26</td>
<td>10</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
<td>59</td>
</tr>
<tr>
<td>Lang</td>
<td>1</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Garlic</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Tobacco</td>
<td>6</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Jowar fodder</td>
<td>5</td>
<td>-</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Lucerne</td>
<td>5</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Grasses</td>
<td>-</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Chiku</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>R</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>X</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>236</td>
<td>14</td>
<td>138</td>
<td>4</td>
<td>130</td>
<td>9</td>
<td>23</td>
<td>7</td>
<td>9</td>
<td>631</td>
</tr>
</tbody>
</table>

Besides, about 60 experiments conducted in the State under the Schemes of Model Agronomic Experiments and Simple Fertilizer Trials of the Indian Concil of Agricultural Research and the experiments conducted on cultivators' fields are also included in the compendium.

It can be seen from the above table that maximum number of experiments among cereals were conducted on Wheat (about 20%) crop although from the acreage point of view Wheat comes after Bajra, Jowar, and Paddy in the State. Experiments on these crops account for 11.7, 10 and 9.5 percent of the total respectively.

Among cash crops, cotton accounts for the largest number of experiments, about 13.8 percent of the experiments being conducted on this crop. Groundnut is the major oilseed crop of the State accounting for about 9.5 percent of the total number of experiments.

Nearly 37 percent of the experiments conducted are purely manurial and 22 percent purely cultural. Experiments involving application of manures as part of treatments account for about 62 percent of the total number of experiments.
About 70.4% of the experiments were laid out in randomised blocks with one or more factors constituting the treatments. About 20.4% of the experiments were laid out in split-plots. Experiments with confounding arrangement of factors in randomised block or split-plot designs accounted for the remaining 9.2% of the experiments.

The number of plots per block in randomised block designs varied from 2 to 36. In split-plot design the no. of main-plots per replication varied from 2 to 27 and no. of sub-plots per-main-plot varied from 2 to 12. The no. of replications in general varied from 1 to 12. The size of net plot in case of R.B.D. ranged from 1/120th of an acre to 1/15th of an acre while in the split-plot designs, the net plot size ranged between 1/400th of an acre to 1/100th of an acre.
PARTICULARS OF RESEARCH STATIONS AND SOIL ANALYSIS

1. Agricultural Research Station, Amreli.

A. General information:
   (i) District Amreli, one mile from Amreli R.S. (ii) It represents plain tract with levelled plots. (iii) Started in 1926. (iv) Millets - Cotton - Groundnut is the cropping pattern. Wherever irrigation facilities are available, irrigated wheat is taken in Rabi after Kharif groundnut. (v) Plant breeding, agronomic and other cultural trials on main crops of the tract are the main aspects of research.

B. Av. rainfall in mm.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250</td>
<td>486</td>
<td>346</td>
<td>354</td>
<td>79</td>
<td>24</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>9</td>
<td>7</td>
<td>1564</td>
<td></td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for 1953-63 period)

C. Irrigation and drainage facilities:
   (i) (a) Facilities available since 1926. (b) Two working wells one operated by oil-engine and the other with motor. (ii) Proper drainage is available.

D. Soil type and Soil Analysis:
   (i) Medium black soil, shallow 2'-3' deep. (ii) Chemical analysis and (iii) Mechanical analysis as below:

   (iii) Chemical analysis (based on samples of soil)

<table>
<thead>
<tr>
<th>Description</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stones</td>
<td>6.22</td>
<td>6.86</td>
<td>6.75</td>
<td>5.44</td>
</tr>
<tr>
<td>Moisture</td>
<td>8.44</td>
<td>10.04</td>
<td>9.42</td>
<td>8.54</td>
</tr>
<tr>
<td>Loss on ignition.</td>
<td>6.28</td>
<td>7.24</td>
<td>8.74</td>
<td>5.74</td>
</tr>
<tr>
<td>Calcium Carbonate</td>
<td>5.80</td>
<td>5.00</td>
<td>5.60</td>
<td>4.80</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>0.08</td>
<td>0.09</td>
<td>0.08</td>
<td>0.07</td>
</tr>
</tbody>
</table>

   (iii) Mechanical analysis

<table>
<thead>
<tr>
<th>Description</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse sand</td>
<td>10.94</td>
<td>17.76</td>
<td>13.24</td>
<td>10.92</td>
</tr>
<tr>
<td>Fine sand (by diff.)</td>
<td>15.46</td>
<td>27.12</td>
<td>29.56</td>
<td>23.20</td>
</tr>
<tr>
<td>Silt</td>
<td>24.80</td>
<td>32.72</td>
<td>36.20</td>
<td>31.06</td>
</tr>
<tr>
<td>Clay</td>
<td>40.80</td>
<td>22.40</td>
<td>21.00</td>
<td>34.40</td>
</tr>
</tbody>
</table>

   (iii) Mechanical analysis

<table>
<thead>
<tr>
<th>Description</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available phosphoric acid (P₂O₅)</td>
<td>12.00</td>
<td>24.60</td>
<td>23.80</td>
<td>18.00</td>
</tr>
<tr>
<td>Available potash (K₂O)</td>
<td>11.00</td>
<td>20.00</td>
<td>22.00</td>
<td>8.00</td>
</tr>
<tr>
<td>pH value</td>
<td>8.30</td>
<td>8.50</td>
<td>8.50</td>
<td>8.60</td>
</tr>
</tbody>
</table>
Water analysis report
Parts per 100,000 parts of water.

<table>
<thead>
<tr>
<th>Description</th>
<th>Well Water 'A'</th>
<th>Well Water 'B'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sol. salts.</td>
<td>67.60</td>
<td>78.20</td>
</tr>
<tr>
<td>Sodium carbonate (Na₂CO₃)</td>
<td>3.45</td>
<td>3.45</td>
</tr>
<tr>
<td>Calcium carbonate (CaCO₃)</td>
<td>26.63</td>
<td>32.57</td>
</tr>
<tr>
<td>Magnesium carbonate (MgCO₃)</td>
<td>6.58</td>
<td>7.33</td>
</tr>
<tr>
<td>Magnesium Sulphate (MgSO₄)</td>
<td>12.50</td>
<td>12.05</td>
</tr>
<tr>
<td>Magnesium chloride (MgCl₂)</td>
<td>...</td>
<td>2.08</td>
</tr>
<tr>
<td>Sodium chloride (NaCl)</td>
<td>17.23</td>
<td>16.12</td>
</tr>
<tr>
<td>pH value</td>
<td>8.75</td>
<td>8.80</td>
</tr>
</tbody>
</table>

E. No. of experiments


2. Institute of Agriculture, Anand.

A. General information:

(i) District Kaira, 3 miles from Anand R.S. Levelled area with few slopy plots. (ii) It represents charan tract of Kaira district. (iii) Started in 1939. (iv) Generally Tobacco, Bajri, Jowar, Wheat, Hybrid Maize, Vegetables etc. is the cropping pattern. (v) Investigations into the improvement and production of common field crops of Gujarat State, are the main aspects of research.

B. Avg. rainfall in mm:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>99.3</td>
<td>355</td>
<td>144</td>
<td>224</td>
<td>20</td>
<td>Nil</td>
<td>843</td>
</tr>
</tbody>
</table>

(Avg. based on rainfall data for 1957-1962).

C. Irrigation and drainage facilities:

(i) (a) Facilities available since 1947. (b) Type of facilities N.A. (ii) Open drains are provided for removing excess rain water.

D. Soil type and soil analysis:

(i) Broad soil type is sandy loam (goru). Deep soil, yellowish brown in colour and massive in structure. (ii) Chemical analysis. and (iii) Mechanical analysis see appendix—I.

E. No. of experiments


3. Agricultural Research Station, Arnej.

A. General information:

(i) (a) District Arnej, one furlong from Arnej R.S. The station is situated more or less in the centre of Bhal tract of 2 lakhs of acres of dry wheat in Ahmedabad district. (ii) Black clayey soil heavily cracking in summer, depth of soil varies from 2' to 5'. (iii) Started in 1944. (iv) Wheat after wheat. (v) Programme of Research : experimentation on wheat.

B. Avg. rainfall in mm:

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>231.1</td>
<td>617.2</td>
<td>350.5</td>
<td>404.3</td>
<td>88.9</td>
<td>17.8</td>
<td>10.2</td>
<td>45.7</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>30.5</td>
</tr>
<tr>
<td></td>
<td>1826.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Avg. based on rainfall data for the period of 3 years).

C. Irrigation and drainage facilities:

(i) (a) Facilities available. (b) Type of facilities—N.A. (ii) There is no proper drainage system.
D. Soil type and soil analysis.

(i) Medium black to deep black soil to a depth of 2' to 5' and clayey in structures.
(ii) Chemical analysis:

<table>
<thead>
<tr>
<th>Depth</th>
<th>Total salts</th>
<th>CaCO₃</th>
<th>pH</th>
<th>Exchangable basis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ca</td>
</tr>
<tr>
<td>0.9&quot;</td>
<td>0.29</td>
<td>10.0</td>
<td>8.55</td>
<td>25.00</td>
</tr>
<tr>
<td>9&quot;-18&quot;</td>
<td>0.36</td>
<td>10.4</td>
<td>87.5</td>
<td>22.00</td>
</tr>
</tbody>
</table>

(iii) Mechanical analysis:

<table>
<thead>
<tr>
<th>Depth</th>
<th>Silt</th>
<th>Clay</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9&quot;</td>
<td>28.25</td>
<td>38.00</td>
</tr>
<tr>
<td>9&quot;-18&quot;</td>
<td>16.00</td>
<td>40.00</td>
</tr>
</tbody>
</table>

E. No. of experiments:

Wheat—12, Gram—7, R+X—3, Total=22.

4. Agricultural Research Station, Bhachau.

A. General information:

(i) District Kutch, one furlong from Bhachau. R.S. Well levelled, well drained and bunded soils. (ii) Sandy soil having scanty rainfall. (iii) Started in 1954. (iv) Bajra, Jowar, Groundnut, Cotton, Wheat is the cropping pattern. (v) Programme of Research is as directed by Agronomy plant breeding and soil science sub-committee.

B. Av. rainfall in mm.:

<table>
<thead>
<tr>
<th>Month</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>March to May</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>41.9</td>
<td>132.08</td>
<td>68.53</td>
<td>92.45</td>
<td>19.81</td>
<td>7.87</td>
<td>4.31</td>
<td>—</td>
<td>1.27</td>
<td>—</td>
<td>268.28</td>
<td></td>
</tr>
</tbody>
</table>

(Av. based on the monthly data for 8 years).

C. Irrigation and drainage facilities:

(i) (a) Facilities available since 1954. (b) Oil-engines. (ii) Proper drainage is available.

D. Soil type and soil analysis:

(i) Sandy alluvial soils having varying depth, white colour and loose structure.

(ii) Chemical analysis.

Percentage of air dry matter:

<table>
<thead>
<tr>
<th>Coarse matter</th>
<th>1.66</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>2.45</td>
</tr>
<tr>
<td>Loss on ignition</td>
<td>0.14</td>
</tr>
<tr>
<td>Water Soluble Salts</td>
<td>—</td>
</tr>
<tr>
<td>Acid insoluble matter</td>
<td>92.55</td>
</tr>
<tr>
<td>Fe and Al oxide</td>
<td>2.40</td>
</tr>
</tbody>
</table>

(iii) Mechanical analysis—N.A.

E. No. of experiments:

Wheat—2, Jowar—1, Total=3.

5. Trial-cum-Demonstration Farm, Bardoli.

A. General information:

(i) District Surat, 2 furlongs from Bardoli R.S. situated at 112' above M.S.L. Land is not so levelled. (ii) Black cotton type soil. (iii) Started in 1957. (iv) Cotton, Jowar, Paddy, Wheat, Vegetables, Sugarcane and Mango is the cropping pattern. (v) Research programme is experimentation on cotton, jowar, wheat, paddy and other crops and studying the possibilities of growing the crops in tuber and vegetable crops.
B. *Av. rainfall in mm.*

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>174</td>
<td>603</td>
<td>393</td>
<td>583</td>
<td>67</td>
<td>Nil</td>
<td>1819</td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for 1954–62 period).

C. *Irrigation and drainage facilities.*

(i) (a) Facilities available since 1958. (b) Canal irrigation. (ii) There is no proper drainage.

D. *Soil type and soil analysis :*

(i) Broad soil type N.A. 4'–5' deep and black in colour. (ii) Chemical analysis: Moisture—2.63, CaCO₃—0.35, Organic matter—0.164, Soluble salts 0.05, Organic Carbon—0.095, Total N—0.05, C:N Ratio—1 : 2, pH—7.5. (iii) Mechanical analysis—N.A.

E. *No. of experiments :*

Paddy—2, Sugarcane—1, Cotton—3, R+X—1, Total=7.

6. *Agricultural Research Station, Bhuwa.*

A. *General information :*

(i) District Broach, 18 K.M. from the Broach R.S. with well levelled land. (ii) Cotton tract of Broach. (iii) Started in 1948. (iv) Cotton after Lang is the cropping pattern. (v) Research programme is experimentation on jowar, cotton, tur, lang, gram, peas, wheat, groundnut etc.

B. *Av. rainfall in mm :*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>29</td>
<td>100</td>
<td>74</td>
<td>26</td>
<td>2</td>
<td>—</td>
<td>10</td>
<td>344</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for 60–63).

C. *Irrigation and drainage facilities :*

(i) (a) Facilities are available since 1946. (b) Type of facilities—N.A. (ii) Proper drainage is available.

D. *Soil type and soil analysis :*

(i) Broad soil type—N.A. Black in colour. (ii) Chemical and (iii) Mechanical analysis—N.A.

E. *No. of experiments :*

Wheat—2, Jowar—9, Misc.—2, R+X—7, Total=20.

7. *Central Research Station, Broach.*

A. *General information :*

(i) District Broach, 11 miles from Broach. The is uniform land without any slopes. (ii) Type of tract is middle Gujarat cotton tract. (iii) Started in 1913. (iv) Cotton after jowar is the cropping pattern. (v) Research programme is to evolve cotton varieties superior to digeįjg.

B. *Av. rainfall in mm :*

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>91</td>
<td>222</td>
<td>177</td>
<td>145</td>
<td>27</td>
<td>3</td>
<td>6</td>
<td>672</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for 60–63).

C. *Irrigation and drainage facilities :*

(i) (a) Facilities—N.A. (b) Type of facilities—N.A. (ii) Proper drainage is available.

D. *Soil type and soil analysis :*

(i) Broad soil type N.A. Deep soils with 3' to 4' depth, dark black in colour and clayey. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.
8. Trial-cum-Demonstration Station, Chikhli.

A. General information
   (i) District Surat, 6 miles from Bilimora R.S. with approximately levelled land (ii) Type of tract is deep black kyari area at south Gujarat for rainfed transplanted paddy. (iii) Started in 1959. (iv) Paddy, wheat, Paddy—maize etc. is the cropping pattern. (v) Programme of research is trials on cultivation practices under the concept of canal irrigation to access the Kakrapar projects.

B. Av. rainfall in mm.: 
   193 561 261 336 — 12 9 — 1371
   (Av. based on rainfall data for June 1962 to May, 1963)

C. Irrigation and drainage facilities:
   (i) (a) Facilities available since 1960. (b) Type of facilities—Canal irrigation. (ii) Proper drainage is available.

D. Soil type and soil analysis:
   (i) Broad soil type N.A. Depth varying from 5' to 7' and even more. Colour is deep black with calcium aggregates. Structure is granular at vaspa and cloddy when dry. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

9. Agricultural Research Station, Dabhoi.

A. General information:
   (i) District Baroda, 2 miles from Dabhoi R.S. (ii) Black cotton soil and Khari land for paddy. (iii) Started in 1937. (iv) Cotton, jowar, paddy, wheat, paddy-gram etc. is the cropping pattern. (v) Research programme is to conduct agronomical experiments on paddy, wheat, jowar, gram and cotton.

B. Av. rainfall in mm.: 
   164.5 385.5 182.3 259.6 44.1 Nil 13.5 1049.6
   (Av. based on rainfall data for 1959 to 61 period).

C. Irrigation and drainage facilities:
   (i) (a) Facilities available since 1937. (b) Type of facilities—Tank. (ii) No proper drainage available.

D. Soil type and soil analysis:
   (i) Broad soil type—N.A. 4' to 5' deep. Black to Besar (slightly brown) in colour. (ii) Chemical analysis: Moisture—2.11, N—0.04, P2O5—16.50; K2O—19.88; CaCO3—2.87; Total Sol. Salt—0.15 and pH—7.9. (iii) Mechanical analysis—N.A.

E. No. of experiments:
   Paddy—3, Total=3.

10. Agricultural Research Station, Deesa.

A. General information:
   (i) District Banaskantha (ii) Type of tract is Banaskantha district tract (iii) Started in 1953. (iv) Bajra, Makki and Gauar etc. is the cropping pattern. (v) Research programme is field experimentation.
B. Av. rainfall in mm.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50</td>
<td>145.54</td>
<td>42.16</td>
<td>109.22</td>
<td>67.31</td>
<td>1.77</td>
<td>366.50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Irrigation and drainage facilities:

(i) (a) Facilities—N.A. (b) Type of facilities—N.A. (ii) No proper drainage available.

D. Soil type and soil analysis:

(i) Sandy loam. Indefinite in depth, yellowish in colour and loose and drible. (ii) Chemical analysis: P—8.34, CaCO₃—0.74, Ca—2, Mg—3, Na+K₀—1.1. (iii) Mechanical analysis: Silt—4.80, Clay—12.50.

E. No. of experiments:


A. General information:

(i) District Panchmahals, 2½ miles from Dohad R.S. (ii) Type of tract is hilly, rocky, gravelly and slopy. (iii) Started in 1907. (iv) Maize after dry wheat or gram after maize. Paddy—wheat—paddy is the cropping pattern. (v) Research programme: conducting different agronomic and plant breeding experiments.

B. Av. rainfall in mm.

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>23.11</td>
<td>230.88</td>
<td>252.22</td>
<td>259.84</td>
<td>21.30</td>
<td>9.14</td>
<td>3.18</td>
<td></td>
<td>800.33</td>
<td></td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for the period N.A.)

C. Irrigation and drainage facilities:

(i) (a) Facilities available. (b) One tank. (ii) No. proper drainage available.

D. Soil type and soil analysis:

(i) Broad soil type—N.A. 1½ to 2 deep. Medium black to gorudu in colour. Gravelly in structure. (ii) Chemical analysis and (iii) Mechanical analysis is as below.

**Chemical Analysis**

<table>
<thead>
<tr>
<th>Depth in inches</th>
<th>0—4*</th>
<th>4—11*</th>
<th>11—21*</th>
<th>21—40*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>0.71</td>
<td>1.86</td>
<td>2.35</td>
<td>2.58</td>
</tr>
<tr>
<td>Loss on ignition (excluding moisture)</td>
<td>7.69</td>
<td>7.55</td>
<td>7.99</td>
<td>8.65</td>
</tr>
<tr>
<td>CaCO₃</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
</tr>
<tr>
<td>Total K₂O</td>
<td>0.41</td>
<td>0.41</td>
<td>0.34</td>
<td>0.44</td>
</tr>
<tr>
<td>Total P₂O₅</td>
<td>0.127</td>
<td>0.130</td>
<td>0.117</td>
<td>0.068</td>
</tr>
<tr>
<td>Total N</td>
<td>0.070</td>
<td>0.062</td>
<td>0.034</td>
<td>0.034</td>
</tr>
<tr>
<td>Available K₂O</td>
<td>0.024</td>
<td>0.016</td>
<td>0.014</td>
<td>0.021</td>
</tr>
<tr>
<td>Available P₂O₅</td>
<td>0.058</td>
<td>0.044</td>
<td>0.023</td>
<td>0.009</td>
</tr>
</tbody>
</table>

(Mili equivalent percent)

| Exchangeable Ca | 14.00 | 17.00 | 18.50 | 21.50 |
| Exchangeable Mg | 2.00  | 3.00  | 4.00  | 2.00  |
| Exchangeable Na | 2.30  | 1.50  | 1.30  | 1.30  |
| Exchangeable K  | 0.79  | 0.68  | 0.56  | 1.54  |
| Total exchangeable bases, sum of the above | 19.09 | 22.18 | 24.36 | 26.34 |
| pH value        | 7.80  | 7.60  | 7.80  | 7.80  |
Mechanical analysis

<table>
<thead>
<tr>
<th>Depth in inches</th>
<th>0-4&quot;</th>
<th>4-11&quot;</th>
<th>11-21&quot;</th>
<th>21-40&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>1.71</td>
<td>1.86</td>
<td>2.36</td>
<td>2.58</td>
</tr>
<tr>
<td>Carbonates (CaCO₃)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Organic matter</td>
<td>5.98</td>
<td>5.67</td>
<td>5.54</td>
<td>6.07</td>
</tr>
<tr>
<td>Clay</td>
<td>30.75</td>
<td>25.75</td>
<td>23.00</td>
<td>33.25</td>
</tr>
<tr>
<td>Silt</td>
<td>17.00</td>
<td>21.50</td>
<td>18.50</td>
<td>21.50</td>
</tr>
<tr>
<td>Fine Sand (estimated by difference)</td>
<td>41.26</td>
<td>43.22</td>
<td>38.30</td>
<td>33.57</td>
</tr>
<tr>
<td>Coarse sand</td>
<td>3.30</td>
<td>2.00</td>
<td>2.30</td>
<td>3.03</td>
</tr>
</tbody>
</table>

E. No. of experiments:
- Wheat—6, Nagli—3, Groundnut—1, R+X—2, Total=12.

12. Fruit Research Station, Gandevi.

A. General information:

(i) District Surat, 2 miles from Gandevi R.S. with uniform level land. (ii) Type of tract—Semi arid Humid region. (iii) Started in 1937. (iv) Perennial crop is the cropping pattern. (v) Research programme is experimentation on chiku and mango crops.

B. Av. rainfall in mm

115.8 568.8 187.8 448.0 1362.4
(Av. based on rainfall data for 1962-63 period)

C. Irrigation and drainage facilities:

(i) (a) Facilities available since 1942. (b) Type of facilities—Crossly Engine B.H.P. 12-13. (ii) No proper drainage available.

D. Soil type and soil analysis:

(i) Broad soil type—N.A. 10' deep. Black in colour. Sandy loam in structure. (ii) Chemical analysis and (iii) Mechanical analysis is as below.

Chemical analysis (percent)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Total P₂O₅</th>
<th>Total K₂O</th>
<th>Organic matter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.57</td>
<td>0.095</td>
<td>0.304</td>
<td>0.057</td>
</tr>
</tbody>
</table>

Mechanical analysis (percent)

<table>
<thead>
<tr>
<th></th>
<th>Coarse</th>
<th>Fine</th>
<th>Silt</th>
<th>Clay</th>
<th>CaCO₃</th>
<th>Sol. Salt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.52</td>
<td>53.83</td>
<td>14.22</td>
<td>21.90</td>
<td>Nil</td>
<td>0.04</td>
</tr>
</tbody>
</table>

E. No. of experiments:
- Fruit—6, Total=6.

13. Agricultural Research Farm, Halvad.

A. General information:

(i) District Surendranagar, 4 miles from Halvad R.S., most of the area is under medium black soil. (ii) Medium black soil. (iii) Started in 1954. (iv) Bajri—wheat—cotton, Groundnut—wheat—cotton, jowar—cotton is the cropping pattern. (v) Research programme is agronomic, breeding and irrigational experiments on various crops.

B. Av. rainfall in mm

31.7 26.33 64.7 116.7 — 0.31 — 4.4 3.4 — 6.5 491.0
(Av. based on rainfall data for 1962-63 period)

C. Irrigation and drainage facilities:

(i) (a) Facilities available since 1954. (b) Canal irrigation. (ii) Proper drainage available.
D. Soil type and soil analysis:

(i) Broad soil type—Medium black soil, 0 to 1 foot deep, light black colour. Platy in structure (ii) Chemical analysis—Quantity in %—N—0.03; P—5.22, K_2O—3.38; T.S.S.—0.08 and pH value 7.9. (iii) Mechanical analysis—N.A.

E. No. of experiments:


A. General information:

(i) (a) District Mehsana, 1½ miles from Harij R.S. (ii) Type of tract is sandy clay to clay loam. (iii) Started in 1940. (iv) Cotton, bajri, jowar, groundnut and wheat is the cropping pattern. (v) Research programme is to investigate the possibility of reducing salinity by deep ploughing.

B. Avg. rainfall in mm:

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33.2</td>
<td>56.0</td>
<td>32.0</td>
<td>—</td>
<td>—</td>
<td>121.2</td>
</tr>
</tbody>
</table>

C. Irrigation and drainage facilities:

(i) (a) Facilities depend upon monsoon. (b) Type of facilities—N.A. (ii) Proper drainage available.

D. Soil type and soil analysis:

(i) Broad soil type—N.A. Deep, black in colour. Structure sound. (ii) Chemical analysis—It is sandy clay to clay loam in texture and being clayed in the lower depth. The soils are highly saline. (iii) Mechanical analysis is given below:

<table>
<thead>
<tr>
<th>Depth</th>
<th>Clay %</th>
<th>Salt %</th>
<th>pH</th>
<th>Total sol. salt %</th>
<th>CaCO_3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0—3&quot;</td>
<td>71.75</td>
<td>27.50</td>
<td>8.38</td>
<td>0.274</td>
<td>7.85</td>
</tr>
<tr>
<td>3&quot;—6&quot;</td>
<td>8.00</td>
<td>19.25</td>
<td>8.84</td>
<td>0.384</td>
<td>2.72</td>
</tr>
<tr>
<td>6&quot;—12&quot;</td>
<td>22.25</td>
<td>3.00</td>
<td>8.65</td>
<td>0.258</td>
<td>2.74</td>
</tr>
<tr>
<td>12&quot;—24&quot;</td>
<td>29.30</td>
<td>11.75</td>
<td>8.86</td>
<td>0.762</td>
<td>5.49</td>
</tr>
<tr>
<td>24&quot;—36&quot;</td>
<td>28.75</td>
<td>4.00</td>
<td>8.58</td>
<td>1.107</td>
<td>2.93</td>
</tr>
<tr>
<td>36&quot;—48&quot;</td>
<td>35.00</td>
<td>4.50</td>
<td>8.08</td>
<td>1.52</td>
<td>4.31</td>
</tr>
<tr>
<td>48&quot;—60&quot;</td>
<td>30.75</td>
<td>0.075</td>
<td>8.78</td>
<td>2.32</td>
<td>5.29</td>
</tr>
</tbody>
</table>

E. No. of experiments:

Bajra—2, Fodder—4, Misc.—2, Total=8.

15. Dry Farming Research Station, Jam-khambhalia.

A. General information:

(i) (a) District Jamnagar, 2 miles from Jam-khambhalia R.S. Slightly even (ii) Type of tract—Greyish black with sand murum come after the depth of 1.5'. (iii) Started in 1957. (iv) Jowar, bajri, groundnut and cotton etc. is the cropping pattern. (v) Research programme is to conduct agronomic and manurial trials on different crops.

B. Avg. rainfall in mm:

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25.5</td>
<td>61.2</td>
<td>23.1</td>
<td>14.0</td>
<td>—</td>
<td>123.8</td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for the period—N.A.)

C. Irrigation and drainage facilities:

(i) (a) Facilities are not available. (b) Type of facilities—N.A. (ii) Proper drainage—N.A.
D. Soil type and soil analysis:
(i) Broad soil type—N.A. 6” to 1.5’ deep. Colour greyish black with sand. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments:
Bajra—2, Cotton—2, Groundnut—3, Total=7.

16. Irrigation-cum-Demonstration Farm, Jamnagar.

A. General information:
(i) District Jamnagar, 3 miles from Jamnagar R.S. Flat, almost levelled. (ii) Type of tract—light to medium black soil. (iii) Started in 1952. (iv) Bajra, jowar, castor, groundnut, wheat is the cropping pattern. (v) Research programme is to conduct varietal trials on groundnut, jowar, cotton and agronomic and breeding trials.

B. Av. rainfall in mm:

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>92.2</td>
</tr>
<tr>
<td>July</td>
<td>154.4</td>
</tr>
<tr>
<td>Aug.</td>
<td>184.1</td>
</tr>
<tr>
<td>Sept.</td>
<td>90.7</td>
</tr>
<tr>
<td>Oct.</td>
<td>2.5</td>
</tr>
<tr>
<td>Nov. to May</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>534.2</td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for 1960-61 to 1962-63 period).

C. Irrigation and drainage facilities:
(i) (a) Facilities available, since 1952. (b) Type of facilities—well irrigated. (ii) Proper drainage—N.A.

D. Soil type and soil analysis:
(i) Broad soil type—N.A. 2” to 1’ deep. Colour light to medium black particles of murum. Structure semi compact. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments:

17. Central Experimental Station, Junagadh.

A. General information:
(i) District Junagadh, 5 miles from Junagadh R.S. Situated near the mountain Girnar. Lime stones are observed below the ground level at a depth 1’ to 2’ at many places. (ii) Type of tract—medium black-soil with the depth 1’ to 14’. The lime stone is absorbed below the said layer. (iii) Started in 1950. (iv) Cotton, jowar, bajra, cotton—groundnut—wheat, groundnut—cotton, jowar—groundnut are the cropping pattern. (v) Research programme is to conduct experiment on Jowar, Bajra, Wheat, Rice, Cotton and Groundnut.

B. Av. rainfall in mm:

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>50.0</td>
</tr>
<tr>
<td>July</td>
<td>161.5</td>
</tr>
<tr>
<td>Aug.</td>
<td>77.7</td>
</tr>
<tr>
<td>Sept.</td>
<td>29.2</td>
</tr>
<tr>
<td>Oct.</td>
<td>1.0</td>
</tr>
<tr>
<td>Nov.</td>
<td>6.3</td>
</tr>
<tr>
<td>Dec.</td>
<td>2.5</td>
</tr>
<tr>
<td>Jan.</td>
<td>1.3</td>
</tr>
<tr>
<td>Feb.</td>
<td>2.5</td>
</tr>
<tr>
<td>March</td>
<td>8.6</td>
</tr>
<tr>
<td>April</td>
<td>—</td>
</tr>
<tr>
<td>May</td>
<td>340.6</td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for 50 years).

C. Irrigation and drainage facilities:
(i) (a) Facilities available since 1955, but not satisfactory. (b) Type of facilities—Wells, reservoir. (ii) Proper drainage—N.A.

D. Soil type and soil analysis:
(i) Broad soil type—N.A. 1’ to 14’ deep. Colour: medium black. Structure: grumpy. (ii) Chemical analysis and (iii) Mechanical analysis is as below.
(xxx)

(ii) Chemical analysis:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>% air dry soil</th>
<th>pH</th>
<th>Conductivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>7.622</td>
<td>7.95</td>
<td>0.33</td>
</tr>
<tr>
<td>Lime reserve</td>
<td>1.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic matter</td>
<td>3.173</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water soluble salts</td>
<td>0.127</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic carbon</td>
<td>1.84</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(iii) Mechanical Analysis:

Available K: 12.50—m.e. 100 gm over dry soil
Available P: 17.42—m.e. 100 gm over dry soil

E. No. of experiments:

18. Trial-cum-Demonstration Farm, Kholwad.

A. General information:

(i) District Surat, 6 miles from Sayan R.S. Slightly slopy land. (ii) Type of tract—'D' region in Kakrapara project. (iii) Started in 1957. (iv) Jowar—cotton, Ground-nut—cotton, Wheat—paddy, is the cropping pattern. (v) Re-search programme is to change the present cropping pattern and to find out the manurial requirements and rotational practices, demonstration of tried agricultural practices under irrigation and to find out water requirements of different crops, effect of various agronomic practices on soil and sub-soil water.

B. Av. rainfall in mm.:

<table>
<thead>
<tr>
<th>Month</th>
<th>Jun</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec to May</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1816</td>
<td>6056</td>
<td>3656</td>
<td>3063</td>
<td>694</td>
<td>155</td>
<td>15440</td>
<td></td>
</tr>
</tbody>
</table>


C. Irrigation and drainage facilities:

(i) (a) Facilities available since 1958. (b) Type of facilities is canal irrigation. (ii) Proper drainage—N.A.

D. Soil type and soil analysis:

(i) Broad soil type—N.A. Black soil upto 4' depth and below yellowish soil. Structure black heavy soil. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments:

Wheat—2, Cotton—4, Groundnut—1, Total=7.

19. Trial-cum-Demonstration Farm, Kim.

A. General information:

(i) District Surat 1 mile from Kim R.S. Fairly even. (ii) Type of tract "E" region of area under Kakrapara command. (iii) Started in 1959. (iv) Cotton—fallow, wheat—groundnut, jowar-Sann-Green, Cotton—wheat—cotton is the cropping pattern. (v) Research programme—Agronomic as well as plant breeding on various crops.

B. Av. rainfall in mm.:

<table>
<thead>
<tr>
<th>Month</th>
<th>Jun</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Jan to May</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>186.4</td>
<td>526.9</td>
<td>182.0</td>
<td>190.8</td>
<td>60.4</td>
<td></td>
<td>1146.5</td>
<td></td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for the period of 4 year).

C. Irrigation and drainage facilities:

(i) (a) Facilities available since 1960. (b) Type of facilities—Canal irrigation. (ii) Proper drainage—N.A.

D. Soil type and soil analysis:

(i) (a) Broad soil type—N.A. 3' deep. Blackish in colour. Structure—Cloddy aggregates. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.
E. No. of experiments:
   Jowar—1, Total=1.

20. Agricultural Research Station, Kodyadra (1 experiment on cotton only).
   Details—N.A.

21. Agricultural Research Station, Nakhatrana

A. General information:
   (i) District Kutch, 35 miles from Bhuj R.S. Levelled area. (ii) Type of tract is semi arid.
   (iii) Started in 1954. (iv) Lucern-cereals, Groundnut-Jowar-Lucern-cotton, Cotton-Groundnut,
   Wheat-Groundnut is the cropping pattern. (vi) Research programme is agronomic research
   and demonstration.

B. Av. rainfall in mm.—N.A.

C. Irrigation and drainage facilities:
   (i) (a) Facilities available. Since 1954. (b) Type of facilities—N.A. (ii) Proper
   drainage—N.A.

D. Soil type and soil analysis:
   (i) Broad soil type—N.A. Structure sandy loam. (ii) Chemical analysis and (iii)
   Mechanical analysis—N.A.

E. No. of experiments:
   Wheat—1, Total = 1.

22. Agricultural Research Station, Navagam.

A. General information:
   (i) District Kaira, 10 miles from Barejadi R.S. Latitude 20°—48° North, Longitude 72°—
   36° East, Altitude 150' above M.S.L. (ii) Type of tract—Kiyari paddy tract served by canal
   irrigation. (iii) Started in 1945. (iv) Paddy-wheat is the cropping pattern. (v) Research
   programme is breeding and agronomic experiments on transplanted paddy crop varieties.

B. Av. rainfall in mm.:

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>135.4</td>
<td>227.3</td>
<td>176.8</td>
<td>804</td>
<td>231.8</td>
<td>24.4</td>
<td>3.8</td>
<td>1.0</td>
<td>2.8</td>
<td>886.7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Av. based on rainfall for period N.A.)

C. Irrigation and Drainage facilities:
   (i) (a) Facilities available. since 1950. (b) Type of facilities—Canal irrigation.
   (ii) Proper drainage—N.A.

D. Soil type and soil analysis:
   (i) Broad soil type—Alluvial sandy to clay loam. 4' deep with calcareous impervious
   (ii) Chemical analysis:

| pH in water | 8.1 | Moisture | 1.73  |
| N           | 0.070 | Carbonate CaCO₃ | 0.71  |
| Phosphoric acid | 0.30 | Coarse sand | 9.82  |
| Potash (K₂O) | 0.36 | Silt | 11.12 |
| Lime (CaO)   | 0.74 | Clay | 17.52 |
| Carbon       | 0.47 | Fine sand | 58.98 |

(iii) Mechanical analysis.

E. No. of experiments:
   Paddy—10, Total = 10.
23. Agricultural Research Station, Porbandar.

A. General information:
   (i) (a) District Junagadh, 3 miles from Porbandar R.S. Hilly area, climate on the whole is dry. (ii) Type of tract is Porbandar tract. (iii) Started in 1954. (iv) Cotton-Groundnut is the cropping pattern. (v) Research programme—research on Bajri, Jowar, Groundnut, wheat, cotton etc. is carried out with reference to spacing, manure and irrigation.

B. Av. rainfall in mm:

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>1166</td>
</tr>
<tr>
<td>July</td>
<td>744</td>
</tr>
<tr>
<td>Avg.</td>
<td>1910</td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for the period N.A.)

C. Irrigation and drainage facilities:
   (i) (a) Facilities available since 1954. (b) Type of facilities—Well with 12 H.P. oil engine. (ii) Proper drainage N.A.

D. Soil type and soil analysis:
   (i) Broad soil type N.A. 9" deep. Light red colour. Structure sandy loam. (ii) Chemical analysis pH value is 7.3 (iii) Mechanical analysis N.A.


A. General information:
   (i) District Surat, 4 miles from Surat R. S. Levelled. (ii) Type of tract—Black Cotton soil of South Gujarat. (iii) Started in 1896. (iv) Cotton and Jowar is the cropping pattern. (v) Research programme is plant breeding, agronomic and entomological work on cotton and jowar and crop weather study.

B. Av. rainfall in mm:

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>1692.9</td>
</tr>
<tr>
<td>July</td>
<td>4129.0</td>
</tr>
<tr>
<td>Avg.</td>
<td>5761.9</td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for the period N.A.)

C. Irrigation and drainage facilities:
   (i) (a) Facilities available since 1957. (b) Cranial irrigation. (ii) Proper drainage available.

D. Soil type and soil analysis:
   (i) Broad soil type—Black cotton soil. 4' to 6' deep. Black with sticky yellow sub soil. Structure—Fine.
   (ii) Chemical analysis
   
<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>0.024 to 0.43%</td>
</tr>
<tr>
<td>P2O5</td>
<td>0.05%</td>
</tr>
<tr>
<td>K2O</td>
<td>0.0263 to 0.61%</td>
</tr>
<tr>
<td>CaO</td>
<td>0.19 to 1.52%</td>
</tr>
</tbody>
</table>

(iii) Mechanical analysis
   
<table>
<thead>
<tr>
<th>Layer</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil surface 9&quot;</td>
<td>Sub soil</td>
</tr>
<tr>
<td>Clay and silt 62%</td>
<td>Clay and silt 34%</td>
</tr>
<tr>
<td>Fine sand 33%</td>
<td>Fine sand 48%</td>
</tr>
<tr>
<td>Stone and gravel 3%</td>
<td>Stone and gravel 18%</td>
</tr>
</tbody>
</table>

E. No. of experiments:
   Jowar—24, Cotton—22, R+X—12, Total=58.

25. Agricultural Research Station, Talod.

A. General information:
   (i) District Sabarkantha; 2 miles from Sabarkanth R.S. The soil is of sandy loam type. (ii) Type of tract—North Gujarat. (iii) Started in 1955—1956. (iv) Cropping
pattern—Groundnut—cotton. (v) Research in Bajari, Jowar, Mug and Tur for increasing yield and also Agronomic practices such as spacing, thinning, manurial requirements etc. is the programme of research.

B. **Av. rainfall in mm.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitation</td>
<td>53.8</td>
<td>543.6</td>
<td>389.6</td>
<td>363.2</td>
<td>8.0</td>
<td>2.0</td>
<td></td>
<td></td>
<td>1360.2</td>
</tr>
</tbody>
</table>

C. **Irrigation and drainage facilities:**

(i) (a) Facilities available since 1959—1960. (b) Type of facilities—N.A. (ii) There is no proper drainage system.

D. **Soil type and soil analysis:**

(i) Broad soil type—N.A. Depth 2' to 4' yellows and 5 to 8 blades.

(ii) Chemical Analysis.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture</td>
<td>5.10</td>
</tr>
<tr>
<td>N</td>
<td>0.08</td>
</tr>
<tr>
<td>Phosphate (P₂O₅)</td>
<td>15.00</td>
</tr>
<tr>
<td>Available Potash (K₂O)</td>
<td>18.00</td>
</tr>
<tr>
<td>Lime (CaCO₃)</td>
<td>2.15</td>
</tr>
<tr>
<td>Total Soluble salts</td>
<td>0.07</td>
</tr>
<tr>
<td>pH</td>
<td>7.50</td>
</tr>
</tbody>
</table>

(iii) Mechanical Analysis.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse sand</td>
<td>42.01</td>
</tr>
<tr>
<td>Fine sand</td>
<td>41.20</td>
</tr>
<tr>
<td>Clay+Silt</td>
<td>9.53</td>
</tr>
</tbody>
</table>

E. **No. of experiments:**

Jowar—5, Bajra—6, Groundnut—9 Total—20.

**26. Irrigation-cum-Demonstration Farm, Umrala.**

A. **General information:**

(i) Bhavnagar district, 3 miles from Dhola R. S. The area is rather undulated with both ways slopes in certain plots. (ii) Type of tract—The area is under the Ranghala tank. (iii) Started in 1956. (iv) Cropping pattern—Groundnut—Bajra—Jowar—Cotton, Wheat—Gram etc. (v) Programme of research—To carry out irrigational and agronomic experiments, to study the introduction of new irrigated crops and their suitability.

B. **Av. rainfall in mm.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitation</td>
<td>100.2</td>
<td>134.0</td>
<td>107.2</td>
<td>119.8</td>
<td>24.0</td>
<td>66.0</td>
<td></td>
<td>551.2</td>
</tr>
</tbody>
</table>

(Av. based on rainfall from 1960—1963).

C. **Irrigation and drainage facilities:**

(i) (a) Facilities available since 1956. (b) Type of facilities—N.A. (ii) There is proper drainage system.

D. **Soil type and soil analysis:**

(i) Broad soil type—N.A. Depth about 3'. Colour—medium black.

(ii) Chemical Analysis % of dry soil as given below. (iii) Mechanical analysis—N.A.

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic matter</td>
<td>1.031 to 1.653</td>
</tr>
<tr>
<td>Total N</td>
<td>0.237 to 0.626</td>
</tr>
<tr>
<td>P</td>
<td>7.6 to 7.9</td>
</tr>
<tr>
<td>Potassium (K)</td>
<td>28.88 to 39.39</td>
</tr>
<tr>
<td>Phosphoric acid (P)</td>
<td>15.99 to 32.43</td>
</tr>
</tbody>
</table>

E. **No. of experiments:**

27. Soil Conservation Res. Demonstration and Training Centre, Vasad.

A. General information:

(i) Kaira district. Marginal and Table lands. Ravines and gully slopes and waste lands. (ii) Type of tract—The soils are alluvial in nature and are generally loamy in texture, while range of soil texture is sandy loam, silty loam, clay loam. The soils in general are low in total soluble salt contents. (iii) Started in 1955–1956. (iv) Cropping pattern—Cotton, Bajri, Mug—Legumes, Tobacco—Kodra, Tur, Grasses. (v) Programme of Research—To find out the ways and means to arrest immediately the devastating rate of soil erosion and prevent the conservation of valuable cultivated marginal and table lands into gullies and research on cotton, legumes, tobacco etc. and some perennial crops.

B. Av. rainfall in mms.:

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>101.6</td>
<td>341.2</td>
<td>187.2</td>
<td>184.3</td>
<td>16.0</td>
<td>9.0</td>
<td>—</td>
<td>839.3</td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for the period 1952–1962).

C. Irrigation and drainage facilities:

(i) (a) Facilities—N.A. (unirrigated). (b) Type of facilities N.A. (ii) There is no proper drainage system.

D. Soil type and soil analysis:

(i) Broad soil type—Sandy loam to loam. (ii) Chemical Analysis. pH—7.2 to 9.5 i.e. mildly alkaline to throughly alkaline, organic carbon—0.048% to 0.68%, Total Nitrogen=0.01% to 0.07%, most of the soils having less than 0.05%, N. Total P2O5—0.5 to 0.1% but generally below 1%. (iii) Mechanical analysis—N.A.

E. No. of experiments:

Cotton—5, Tobacco—3, Fodder—3, Misc.—8, Total=19.

28. Agricultural Research Station, Vijapur.

A. General information:

(i) Mehsana district. 2 miles from Vijapur R. S. The experimental site is situated at about 421' above M.S.L. The land is not quite even. The difference between the highest and the lowest point is about 30'. (ii) Type of tract—Sandy loam. (iii) Started in 1944. (iv) Cropping pattern—Bajri, Castor, Jowar, Cotton, Tobacco, Fennell—Kharif; Wheat-Cumin and Isabgol—Rabi. (v) Programme of Research—Selection, breeding and hybridisation in Bajri, wheat and jowar, varietal and agronomic expts, in these crops as well as in cotton, tobacco tur, groundnut, castor and other crops.

B. Av. rainfall in mms.:

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>70.1</td>
<td>294.9</td>
<td>142.7</td>
<td>224.4</td>
<td>38.7</td>
<td>2.5</td>
<td>0.2</td>
<td>1.2</td>
<td>1.1</td>
<td>—</td>
<td>7.7</td>
<td>0.6</td>
<td>90.27</td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for 5 years).

C. Irrigation and drainage facilities:

(i) (a) Facilities—N.A. (b) Type of facilities—N.A. (ii) There is no proper drainage system.

D. Soil type and soil analysis:

(i) Broad soil type—Sandy loam, depth—deep soils, depth more than 20' to 30', Colour—light brown to light red. (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments:

29. Agricultural Research Station, Viramgam.

A. General information.

(i) District Ahmedabad 1 mile from Viramgam R.S. The area is quite flat. (ii) Type of tract—Medium black soils. (iii) Started in 1922. (iv) Cropping pattern—Cotton, Jowar—Cotton. (v) Programme of research—Breeding in cotton and jowar to evolve a variety superior to the present.

B. Av. rainfall in mm.

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.8</td>
<td>1.3</td>
<td>1.3</td>
<td>1.8</td>
<td>2.0</td>
<td>0.8</td>
<td>9.9</td>
<td>583.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Av. based rainfall data for the period—N.A.)

C. Irrigation and drainage facilities.

(i) (a) Facilities available. (b) Type of facility: Boye well with a pumping set. (ii) There is no proper drainage system.

D. Soil type and soil analysis.

(i) Broad soil type—N.A. Depth 40" on an average. Colour—Greyish black. Structure—Cloddy. (ii) Chemical analysis and (iii) Mechanical analysis as below:

<table>
<thead>
<tr>
<th>Soil depth</th>
<th>pH</th>
<th>Total soluble salts</th>
<th>Calcium carbonate</th>
<th>Exchangeable bases in milli-equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>0—13&quot;</td>
<td>8.53</td>
<td>0.15</td>
<td>11.2</td>
<td>22.0</td>
</tr>
<tr>
<td>13&quot;—23&quot;</td>
<td>8.61</td>
<td>0.19</td>
<td>15.6</td>
<td>28.5</td>
</tr>
<tr>
<td>23&quot;—32&quot;</td>
<td>8.66</td>
<td>0.19</td>
<td>15.2</td>
<td>29.5</td>
</tr>
<tr>
<td>32&quot;—42&quot;</td>
<td>8.61</td>
<td>0.15</td>
<td>28.8</td>
<td>20.5</td>
</tr>
<tr>
<td>42&quot;—50&quot;</td>
<td>8.63</td>
<td>0.11</td>
<td>32.8</td>
<td>18.5</td>
</tr>
</tbody>
</table>

E. No. of experiments:

Cotton—3, Fodder—1, Total=4.

30. Agricultural Research Station, Vyara.

A. General information:

(i) District Surat. It is slightly sloping from west to east. Some western part of the farm is stoney. (ii) Type of tract is black cotton soil of the Surat district. (iii) Started in 1935. (iv) Sugarcane, Paddy and Wheat etc. is the cropping pattern. (v) Field experimentation.

B. Av. rainfall in mm:

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10.92</td>
<td>30.58</td>
<td>2254.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for the period 1958)
C. Irrigation and drainage facilities:
   (i) (a) Facilities available since 1935.  (b) Type of facilities—N.A.  (ii) Proper drainage—N.A.

D. Soil type and soil analysis:
   (i) Broad soil type—Black cotton, 0.12" and 0.18" deep. Black in colour and clayey.
   (ii) Chemical analysis: Lime—2.0 to 5.0%, P_{2}O_{5}—0.005 to 0.01%, K_{2}O—0.02 to 0.06%.
   (iii) Mechanical analysis—N.A.

E. No. of experiments:
   Paddy—10, Sugarcane—17, Total=27.

31. Agricultural Research Station, Waghai.

A. General information:
   (i) District Danga, ½ mile from Waghai R.S. The average rainfall is ranging from 60" to 80" with minimum temperature ranging 30° to 40° F in winter.  (ii) About 65% of the soils (at high level) are of reddish colour with less water holding capacity and very porous, and the remaining, medium black.  (iii) Started in 1954.  (iv) Paddy and Nagli.  (v) Research programme is to evolve high yielding, early maturing and disease resistant strains of paddy.

B. Av. rainfall in mm.

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>37.0</td>
</tr>
<tr>
<td>July</td>
<td>51.7</td>
</tr>
<tr>
<td>Aug.</td>
<td>23.5</td>
</tr>
<tr>
<td>Sept.</td>
<td>33.5</td>
</tr>
<tr>
<td>Oct.</td>
<td>7.2</td>
</tr>
<tr>
<td>Nov.</td>
<td>2.5</td>
</tr>
<tr>
<td>Dec.</td>
<td></td>
</tr>
<tr>
<td>May</td>
<td></td>
</tr>
</tbody>
</table>

(Av. based on rainfall data for the period 1961-62, 62-63).

C. Irrigation and drainage facilities:
   (i) (a) Facilities—N.A.  (b) Type of facilities—N.A.  (ii) Proper drainage—N.A.

D. Soil type and soil analysis:
   (i) Broad soil type—N.A. More than 3' deep, medium black in colour and structure sticky.  (ii) Chemical analysis and (iii) Mechanical analysis—N.A.

E. No. of experiments:
   Wheat—2, Nagli—11, Gram—3, Total=16.
## APPENDIX—I

**Mechanical and Chemical analysis of Soil**

(Per cent on air dry soil)

<table>
<thead>
<tr>
<th>Farm Section</th>
<th>B.T. Horticulture 31</th>
<th>Horticulture 33</th>
<th>S.M. F.S. F6</th>
<th>S.M. F.S. F4</th>
<th>Commercial</th>
<th>Dairy N4</th>
<th>Dairy A3</th>
<th>College G10</th>
<th>College Building Area</th>
<th>School Piplo</th>
<th>School Asopal</th>
<th>Plant Breeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auctioned tobacco sample No.</td>
<td>1</td>
<td>2&amp;8</td>
<td>2&amp;8</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5&amp;7</td>
<td>5&amp;7</td>
<td>6&amp;10</td>
<td>6&amp;10</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Coarse sand</td>
<td>0.60</td>
<td>0.62</td>
<td>0.77</td>
<td>1.14</td>
<td>1.60</td>
<td>0.81</td>
<td>0.96</td>
<td>0.55</td>
<td>0.79</td>
<td>0.49</td>
<td>0.90</td>
<td>0.57</td>
</tr>
<tr>
<td>Fine sand</td>
<td>77.39</td>
<td>83.03</td>
<td>78.73</td>
<td>72.06</td>
<td>67.27</td>
<td>78.53</td>
<td>78.82</td>
<td>81.66</td>
<td>89.30</td>
<td>78.18</td>
<td>83.86</td>
<td>81.69</td>
</tr>
<tr>
<td>Silt</td>
<td>6.00</td>
<td>0.62</td>
<td>7.01</td>
<td>7.26</td>
<td>10.75</td>
<td>7.26</td>
<td>7.38</td>
<td>5.12</td>
<td>1.87</td>
<td>3.25</td>
<td>6.13</td>
<td>4.00</td>
</tr>
<tr>
<td>Moisture</td>
<td>1.82</td>
<td>1.14</td>
<td>1.07</td>
<td>2.37</td>
<td>2.00</td>
<td>1.05</td>
<td>1.49</td>
<td>1.31</td>
<td>0.55</td>
<td>1.60</td>
<td>0.83</td>
<td>1.31</td>
</tr>
<tr>
<td>Loss on ignition.</td>
<td>1.68</td>
<td>1.61</td>
<td>1.56</td>
<td>2.02</td>
<td>1.65</td>
<td>1.54</td>
<td>1.44</td>
<td>1.60</td>
<td>1.19</td>
<td>1.83</td>
<td>1.39</td>
<td>1.59</td>
</tr>
<tr>
<td>Total soluble salts.</td>
<td>0.020</td>
<td>0.022</td>
<td>0.020</td>
<td>0.015</td>
<td>0.028</td>
<td>0.02</td>
<td>0.016</td>
<td>0.022</td>
<td>0.021</td>
<td>0.016</td>
<td>0.026</td>
<td>0.017</td>
</tr>
<tr>
<td>Calcium carbonate</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
<td>trace</td>
</tr>
<tr>
<td>Organic matter.</td>
<td>0.75</td>
<td>0.44</td>
<td>0.54</td>
<td>0.75</td>
<td>0.67</td>
<td>0.75</td>
<td>0.67</td>
<td>0.67</td>
<td>0.32</td>
<td>0.25</td>
<td>0.34</td>
<td>0.40</td>
</tr>
<tr>
<td>pH</td>
<td>7.3</td>
<td>7.5</td>
<td>7.2</td>
<td>7.2</td>
<td>7.1</td>
<td>7.0</td>
<td>7.7</td>
<td>7.1</td>
<td>7.2</td>
<td>7.0</td>
<td>7.3</td>
<td>7.3</td>
</tr>
<tr>
<td>Total nitrogen.</td>
<td>0.033</td>
<td>0.033</td>
<td>0.038</td>
<td>0.030</td>
<td>0.034</td>
<td>0.039</td>
<td>0.036</td>
<td>0.037</td>
<td>0.024</td>
<td>0.021</td>
<td>0.035</td>
<td>0.029</td>
</tr>
<tr>
<td>Nitrate nitrogen mg./100 gm. soil.</td>
<td>1.75</td>
<td>2.25</td>
<td>2.37</td>
<td>1.00</td>
<td>2.20</td>
<td>3.00</td>
<td>1.55</td>
<td>0.67</td>
<td>3.00</td>
<td>0.87</td>
<td>2.67</td>
<td>1.65</td>
</tr>
<tr>
<td>Available phosphoric acid mg./100 gm. soil.</td>
<td>7.6</td>
<td>6.2</td>
<td>7.5</td>
<td>4.3</td>
<td>11.6</td>
<td>20.8</td>
<td>14.2</td>
<td>8.8</td>
<td>3.9</td>
<td>2.6</td>
<td>6.4</td>
<td>6.2</td>
</tr>
<tr>
<td>Exchangeable potassium m.e.K/100 gm. soil.</td>
<td>0.56</td>
<td>0.54</td>
<td>0.61</td>
<td>0.47</td>
<td>0.54</td>
<td>0.54</td>
<td>0.48</td>
<td>0.39</td>
<td>0.40</td>
<td>0.62</td>
<td>0.54</td>
<td>0.48</td>
</tr>
</tbody>
</table>
Object:—To study the N and P_205 requirements and their effect on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Bajra. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 7.7.1954. (iv) (a) One ploughing and 3 harrowings. (b) Drilling. (c) 40 lb./ac. (d) 18" apart. (e) —. (v) 5 C.L./ac. of F.Y.M. in May. (vi) Local (medium). (vii) Irrigated. (viii) Three weedings and 3 interculturings. (ix) 25.08". (x) 30.10.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N: N_0 = 0, N_1 = 32, N_2 = 64 and N_3 = 96 lb./ac.
   (2) 4 levels of P_205: P_0 = 0, P_1 = 32, P_2 = 64 and P_3 = 96 lb./ac.
   N as A/S broadcast and P_205 spread in furrows opened by drill.

3. DESIGN:
   (i) 4^2 Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) A. (iv) (a) 33'x18'. (b) 25'x12'. (v) Three rows on either side of the whole experimental block and 2 rows on either side of each plot. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—contd. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2470 lb./ac. (ii) 307.8 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>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>N_3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_0</td>
<td>2303</td>
<td>2673</td>
<td>2840</td>
<td>2421</td>
<td>2559</td>
</tr>
<tr>
<td>P_1</td>
<td>2210</td>
<td>2412</td>
<td>2786</td>
<td>2831</td>
<td>2560</td>
</tr>
<tr>
<td>P_2</td>
<td>2146</td>
<td>2548</td>
<td>2262</td>
<td>2505</td>
<td>2365</td>
</tr>
<tr>
<td>P_3</td>
<td>2205</td>
<td>2353</td>
<td>2509</td>
<td>2521</td>
<td>2397</td>
</tr>
<tr>
<td>Mean</td>
<td>2216</td>
<td>2496</td>
<td>2599</td>
<td>2569</td>
<td>2470</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 76.9 lb./ac.
S.E. of body of table = 153.9 lb./ac.
4. GENERAL:

(i) The germination in replication 4 was defective. Growth in the rest three replications was good. There was lodging in some plots at the time of maturity. (ii) Nil. (iii) Grain and fodder yield. (iv) No. (a) 1951-55. (b) Yes (except in the year 1951). (c) Nil. (v) (a) Bulsar. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1554 lb./ac. (ii) 489.3 lb./ac. (iii) None of the effects and interaction is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>1440</td>
<td>1343</td>
<td>1827</td>
<td>1634</td>
<td>1561</td>
</tr>
<tr>
<td>P₁</td>
<td>1428</td>
<td>1512</td>
<td>1694</td>
<td>1113</td>
<td>1437</td>
</tr>
<tr>
<td>P₂</td>
<td>1125</td>
<td>1525</td>
<td>1742</td>
<td>1972</td>
<td>1591</td>
</tr>
<tr>
<td>P₃</td>
<td>1888</td>
<td>1754</td>
<td>1767</td>
<td>1097</td>
<td>1626</td>
</tr>
<tr>
<td>Mean</td>
<td>1470</td>
<td>1533</td>
<td>1758</td>
<td>1454</td>
<td>1554</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 141.3 lb./ac.
S.E. of body of table = 282.5 lb./ac.

---

**Crop:** Paddy.
**Site:** Agri. Res. Stn., Dabhoi.

Object: To find out the N and P₂O₅ requirements of Paddy.

1. BASAL CONDITIONS:

(i) (a) Paddy-paddy. (b) Paddy. (c) As per treatments. (ii) (a) Black soil. (b) Refer soil analysis, Dabhoi. (iii) 16.6.1955. (iv) (a) N.A. (b) Drilling. (c) 30 lb./ac. (d) 15' between rows. (e) N.A. (f) Nil. (vi) K-226. (vii) Irrigated. (viii) Three weedings and 1 interculturing. (ix) 51.18°. (x) 26.11.1955.

2. TREATMENTS:

Same as in Expt. no. 54(14) on page 1.

Time and method of application N.A.

3. DESIGN:

(i) 4² Fact. in R.B.D. (ii) (a) 16. (b) 240' x 50'. (iii) 4. (iv) (a) 30' x 25'. (b) 20' x 15'. (v) 5' around the net plot. (vi) Yes.

4. GENERAL:

(i) Lodging in all the plots at the time of maturity. (ii) Nil. (iii) Grain and fodder yield. (iv) No. (a) 1951—1955 (b) Yes. (c) Nil. (v) Bulsar and Amreli. (b) No. (vi) Nil. (vii) In N₃ plots due to more vegetative growth yield is less.

5. RESULTS:

(i) 2109 lb./ac. (ii) 512.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>2189</td>
<td>2058</td>
<td>2305</td>
<td>1661</td>
<td>2053</td>
</tr>
<tr>
<td>P₁</td>
<td>2247</td>
<td>2168</td>
<td>2136</td>
<td>1724</td>
<td>2069</td>
</tr>
<tr>
<td>P₂</td>
<td>1770</td>
<td>1933</td>
<td>2654</td>
<td>2442</td>
<td>2200</td>
</tr>
<tr>
<td>P₃</td>
<td>2177</td>
<td>2311</td>
<td>2298</td>
<td>1673</td>
<td>2115</td>
</tr>
<tr>
<td>Mean</td>
<td>2096</td>
<td>2118</td>
<td>2348</td>
<td>1875</td>
<td>2109</td>
</tr>
</tbody>
</table>
Crop: Paddy (Kharif).
Site: Central Expt. Stn., Junagadh.

Object: To study the effect of N applied in different forms, with and without P\(_2\)O\(_5\) on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 30.6.1956. (iv) (a) N.A. (b) Drilling. (c) 20 lb./ac. (d) Between rows—18"; between plants—irregular. (e) N.A. (v) Farm compost at 10 C.L./ac. (vi) M.S.3 (Bhimli type) medium. (vii) Irrigated. (viii) Gap-filling, thinning and 4 weedings. (ix) 59.36". (x) 25, 28-10-1956.

2. TREATMENTS:
All combinations of (1) and (2)
(1) Levels and sources of N: N\(_0\)=0 and N\(_1\)=20 lb./ac. as G.N.C., N\(_2\)=20 lb./ac. as A/S, N\(_4\)=40 lb./ac. as A/S and G.N.C. (1:1).
(2) 2 levels of P\(_2\)O\(_5\) as Super: P\(_0\)=0 and P\(_1\)=30 lb./ac.
N applied at sowing and one month after sowing. P\(_2\)O\(_5\) applied before sowing at root zone.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 15'x9'. (b) 12'x6'. (v) 1'x1'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Attack of paddy blast was observed, damage negligible hence no control measures were taken. (iii) Grain and fodder yield. (iv) (a) 1956—Contd. (b) No. (c) Nil. (v) (a) N.A. (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 1542 lb./ac. (ii) 283.7 lb./ac. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N(_0)</th>
<th>N(_1)</th>
<th>N(_2)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P(_0)</td>
<td>1617</td>
<td>1254</td>
<td>1512</td>
<td>1450</td>
</tr>
<tr>
<td>P(_1)</td>
<td>1853</td>
<td>1307</td>
<td>1656</td>
<td>1689</td>
</tr>
<tr>
<td>Mean</td>
<td>1735</td>
<td>1281</td>
<td>1584</td>
<td>1542</td>
</tr>
</tbody>
</table>

S.E. of N marginal means = 100.3 lb./ac.
S.E. of P marginal means = 70.9 lb./ac.
S.E. of body of table = 141.8 lb./ac.

Crop: Paddy (Kharif).
Site: Central Expt. Stn., Junagadh.

Object: To find out the N and P\(_2\)O\(_5\) requirements of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 13.6.1957. (iv) (a) One ploughing and 2 harrowings. (b) Drilling. (c) 30 lb./ac. (d) Bet. rows 9"; between plants—irregular. (e) N.A. (f) Farm compost at 20 C.L./ac. (vi) S-29 (medium). (vii) Irrigated. (viii) Three gap-fillings, thinning, 3 weedings and 2 intercultivations. (ix) 30.21". (x) 8 to 10-10-1957.
2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 levels of N: $N_0=0$, $N_1=30$, $N_2=40$ and $N_3=50$ lb/ac.
(2) 3 levels of $P_2O_5$: $P_0=0$, $P_1=30$ and $P_2=40$ lb/ac.
N applied as A/S on 1.7, 10.8 and 4.9.1957. $P_2O_5$ applied as Super, drilled at the time of sowing.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) $24' \times 12'$. (b) $20' \times 9'$. (v) $2' \times 1\frac{1}{2}'$. (vi) Yes.

4. GENERAL:
(i) The general growth was normal. (ii) Nil. (iii) Number of tillers, av. height, av. length of ears, av. no. of grains/ear, grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2097 lb/ac. (ii) 238.4 lb/ac. (iii) Main effects of N, P and interaction N×P are highly significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>$N_0$</th>
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<td>2422</td>
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<td>2194</td>
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</tbody>
</table>

S.E. of N marginal means = 59.7 lb/ac.
S.E. of P marginal means = 68.8 lb/ac.
S.E. of body of table = 119.1 lb/ac.

Crop :- Paddy (Kharij).  
Site :- Central Expt. Stn., Junagadh.  
Object :- To study the response of Paddy to N and $P_2O_5$.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) 40 lb/ac. of N and 40 lb/ac. of $P_2O_5$. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 1.7.1958. (iv) (a) N.A. (b) Hand sowing. (c) 30 lb/ac. (d) 9' between rows. (e) —. (v) Nil. (vi) S-201. (vii) Unirrigated. (viii) Nil. (ix) 33.27'. (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)+3 selective treatments
(1) 3 levels of N as A/S: $N_1=30$, $N_2=40$ and $N_3=50$ lb/ac.
(2) 3 levels of $P_2O_5$ as Super: $P_0=0$, $P_1=30$ and $P_2=40$ lb/ac.
(3) 3 methods of applications of N: $M_1$—Broadcasting and $M_2$—Placement 2' deep.
3 selective treatments: $T_0=0$, $T_1=30$ and $T_2=40$ lb/ac. of $P_2O_5$.
N applied in 3 doses on 1.7.1958, 6.8.1958 and 6.9.1958; $P_2O_5$ applied on 1.7.1958.

3. DESIGN:
(i) R.B.D. (ii) (a) 21. (b) N.A. (iii) 4. (iv) (a) $22' \times 15'$. (b) $18' \times 12'$. (v) $2' \times 1.5'$. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1409 lb/ac. (ii) 142.2 lb/ac. (iii) Main effect of N and 'selective vs others' differ highly significantly. Other main effect and interactions do not differ significantly. (iv) Av. yield of grain in lb/ac.
Selective treatments: $T_0=784$, $T_1=819$ and $T_2=886$ lb./ac.

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<td>1722</td>
<td>1505</td>
<td>1487</td>
<td>1524</td>
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</table>

- S.E. of marginal mean of $N$ or $P$ = 29.0 lb./ac.
- S.E. of marginal mean of $M$ = 23.7 lb./ac.
- S.E. of body of $N \times M$ and $P \times M$ tables = 41.0 lb./ac.
- S.E. of body of $N \times P$ table = 50.3 lb./ac.
- S.E. of selective treatment means = 71.1 lb./ac.

Object: To study the response of Paddy to $N$ and $P_2O_5$.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Vegetable. (c) 40 lb./ac. of $N$ and 40 lb./ac. of $P_2O_5$.
   (ii) (a) Medium black. (b) Refer soil analysis, Junagadh.
   (iii) 30.6.1959.
   (iv) (a) N.A. (b) Drilling. (c) 30 lb./ac. (d) N.A. (e) N.A.
   (v) 15 C.L./ac. of F.Y.M. (vi) G-29. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   Same as in Expt. no. 58 (105) on page 4.

3. DESIGN:
   (i) R.B.D. (ii) (a) 21. (b) N.A. (iii) 4. (iv) (a) $22' \times 15'$. (b) $18' \times 12'$. (v) $2' \times 1.5'$. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) No. (iii) Grain yield. (iv) (a) 1958—contd. (b) and (c). (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 813 lb./ac. (ii) 184.6 lb./ac. (iii) Only "selective vs others" is highly significant. Other effects are not significant.
   (iv) Av. yield of grain in lb./ac.

Selective treatments: $T_0=560$, $T_1=668$ and $T_2=675$ lb./ac.

<table>
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<th>$N_3$</th>
<th>Mean</th>
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<th>$P_1$</th>
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<td>902</td>
<td>863</td>
<td>805</td>
<td>892</td>
<td>892</td>
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<tr>
<td>$M_2$</td>
<td>808</td>
<td>840</td>
<td>818</td>
<td>822</td>
<td>858</td>
<td>794</td>
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<td>840</td>
<td>860</td>
<td>843</td>
<td>832</td>
<td>843</td>
<td>853</td>
</tr>
</tbody>
</table>

- S.E. of marginal mean of $N$ or $P$ = 37.7 lb./ac.
- S.E. of marginal mean of $M$ = 30.8 lb./ac.
- S.E. of body of $N \times M$ and $P \times M$ tables = 53.3 lb./ac.
- S.E. of body of $N \times P$ table = 65.3 lb./ac.
- S.E. of selective treatment means = 92.3 lb./ac.
Crop :- Paddy.  
Ref :- Gj. 56(52).  

Type :- 'M'.

Object :- To study the effect of graded doses of K$_2$O on the growth and yield of Paddy.

1. BASAL CONDITIONS :
   (i) (a) Paddy—Wheat. (b) Wheat. (c) 87 Srs/ac. of manure mixture, 18 Srs/ac. of A$_1$N and 11 Srs/ac. of G.N.C. (ii) (a) Medium black soil. (b) Refer soil analysis, Navagam. (iii) 28.6.1956./19.8.1956. (iv) (a) N.A. (b) Transplanting. (c) —— (d) 9" x 9". (e) 1. (v) F.Y.M. at 5 C.L./ac. (vi) Jirasal 280. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 37.58'. (x) 14.11.1956.

2. TREATMENTS :
   All combinations of (1) and (2) 
   (1) 2 levels of N and P : N$_1$P$_1$ = 60 lb./ac. of N+30 lb./ac. of P$_2$O$_5$, N$_2$P$_2$ = 120 lb./ac. of N+60 lb./ac. of P$_2$O$_5$. 
   (2) 3 levels of K$_2$O : K$_1$=0, K$_2$=30 and K$_3$=60 lb./ac.

   N applied as A/S, P$_2$O$_5$ as Super and K$_2$O as Pot. Sul.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 34' x 16'. (b) 30' x 12'. (v) 2' around the net plot. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Attack of jassids and leaf eating caterpillar (case worms). Dusting with Gammexane.
   (iii) Grain and straw yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) Vyara. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 3124 lb./ac. (ii) 300 lb./ac. (iii) Main effect of NP alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>K$_0$</th>
<th>K$_1$</th>
<th>K$_2$</th>
<th>Mean</th>
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<td>N$_1$P$_1$</td>
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<td>3288</td>
<td>3185</td>
<td>3282</td>
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<td>N$_2$P$_2$</td>
<td>3016</td>
<td>2813</td>
<td>3067</td>
<td>2965</td>
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</tbody>
</table>

S.E. of marginal mean of NP = 86.6 lb./ac.
S.E. of marginal mean of K = 106.1 lb./ac.
S.E. of body of table = 150.0 lb./ac.

Crop :- Paddy (Kharif).  
Ref :- Gj. 57(61).  

Type :- 'M'.

Object :- To study the effect of graded doses of K$_2$O on the growth and yield of Paddy.

1. BASAL CONDITIONS : 
   (i) (a) Paddy—Wheat. (b) Wheat. (c) F.Y.M. at 5 C.L./ac. (ii) (a) Black soil. (b) Refer soil analysis, Navagam. (iii) 8.7.1957/24.8.1957. (iv) (a) One ploughing. (b) Transplanting. (c) —— (d) 9" x 9". (e) 1. (v) F.Y.M. at 5 C.L./ac. (vi) Jirasal 280. (vii) Irrigated. (viii) One interculturing. (ix) 13'. (x) 19.11.1957.

2. TREATMENTS :
   Same as in exp. no. 56(52) above.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 16' x 34'. (b) 12' x 30'. (v) 2.25' around. (vi) Yes.
4. GENERAL:
(i) Satisfactory. (ii) Attack of jassids and leaf eating caterpillar—Gammexane applied. (iii) Growth of crop, tiller counts and grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 3278 lb./ac. (ii) 313.8 lb./ac. (iii) Main effect of NP alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>(K_2)</th>
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<tr>
<td>(N_2P_2)</td>
<td>2533</td>
<td>2783</td>
<td>2666</td>
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<tr>
<td>Mean</td>
<td>3105</td>
<td>3362</td>
<td>3366</td>
<td>3278</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of \(N\) \(P\) = 110.9 lb./ac.
S.E. of marginal mean of \(K\) = 90.6 lb./ac.
S.E. of body of table = 156.9 lb./ac.

Crop: Paddy (\textit{Kharif}).
Object: To study the effect of graded doses of \(K_2O\) on the growth and yield of Paddy.

1. BASAL CONDITIONS:

2. TREATMENTS:
Same as in Expt. no. 56(52) on page 6.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) 34'x16'y'. (b) 30'x1 2'. (v) 2.25' around the plot. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Count of tillers, grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2851 lb./ac. (ii) 417.2 lb./ac. (iii) Main effect of NP alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<td>(N_2P_2)</td>
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<td>2913</td>
<td>3228</td>
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<tr>
<td>Mean</td>
<td>2690</td>
<td>2894</td>
<td>2970</td>
<td>2851</td>
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</table>

S.E. of marginal mean of \(N\) \(P\) = 120.4 lb./ac.
S.E. of marginal mean of \(K\) = 147.5 lb./ac.
S.E. of body of table = 208.6 lb./ac.
Crop: Paddy (Kharif).

Object: To study the effect of graded doses of K₂O on growth and yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Wheat. (b) Wheat. (c) Srs.ac. of Super, 50 srs.ac. of A.S and 20 srs.ac. of K₂O.
   (ii) (a) Black soil. (b) Refer soil analysis, Navagam. (iii) 5.7.1959/11.8.1959. (iv) (a) N.A. (b) Transplanting. (c)—.
   (d) 9'x9'. (e) 1. (v) F.Y.M. at 5 C.L/ac. (vi) Virasal-200. (vii) Irrigated. (viii) Two interculturings. (ix) 42'. (x) 20.11.1959.

2. TREATMENTS:
   Same as in expt. no. 56(52) on page 6.

3. DESIGN:
   (i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) 34.5’x16.5’. (b) 30’x12’. (v) 2.25’ around the net plot. (vi) Yes.

4. GENERAL:
   (b) No. (c) Nil. (d) (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2534 lb/ac. (ii) 175.4 lb/ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb/ac.

<table>
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<tr>
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<th>K₂</th>
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</tr>
<tr>
<td>Mean</td>
<td>2544</td>
<td>2508</td>
<td>2557</td>
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S.E. of marginal mean of NP =50.65 lb/ac.
S.E. of marginal mean of K =62.04 lb/ac.
S.E. of body of table =87.33 lb/ac.

Crop: Paddy.

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

1. BASAL CONDITIONS:
   (i) (a) Paddy—Wheat. (b) Wheat. (c) F.Y.M. at 15 C.L/ac. (ii) Medium black soil. (b) Refer soil analysis, Navagam. (iii) 2.7.1955/23 to 26.8.1955. (iv) (a) N.A. (b) Transplanting. (c)—.
   (d) 10’x10’. (e) 1. (v) F.Y.M. at 5 C.L/ac. (vi) Pankhari-203. (vii) Irrigated. (viii) Two interculturings and 2 weedings. (ix) 23.91'. (x) 13.11.1955.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of N as A S : N₁=30 and N₂=60 lb/ac.

Sub-plot treatments:
   12 times of application of N : N₄=Control (no top dressing), M₁=full dose at 1st ploughing, M₂=full dose broadcast at transplanting, M₃=full dose broadcast at transplanting, M₄=½ dose broadcast at transplanting ½ dose broadcast at tillering, M₅=½ dose as pellets at transplanting ½ dose broadcast at tillering
   Dry application of ½ dose at 1st ploughing ½ dose broadcast at transplanting ½ dose broadcast at tillering
   M₆=Dry application of ½ dose broadcast at transplanting ½ dose broadcast at tillering
   M₇=½ dose broadcast at transplanting +½ dose broadcast at tillering +½ dose broadcast at flowering
   M₈=dry application of 2 doses as pellets at transplanting 2 doses broadcast at tillering 2 doses broadcast at flowering
   M₉=½ dose broadcast at transplanting 2 doses broadcast at tillering 2 doses broadcast at flowering
   M₁₀=½ dose application at pre-cultivation stage ½ dose broadcast at tillering ½ dose broadcast at flowering
   M₁₁=½ dose dry application at pre-cultivation stage ½ dose broadcast at tillering ½ dose broadcast at flowering
   M₁₂=½ dose dry application at pre-cultivation stage ½ dose broadcast at tillering ½ dose broadcast at flowering.
3. **DESIGN:**
   (i) Split-plot. (ii) (a) 2 main-plots/block and 12 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 35'×20' (b) 30'×15'. (v) 2' around the net plot. (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory. (ii) Mild attack of blast. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) No. (vii) Nil.

5. **RESULTS:**
   (i) 1943 lb./ac. (ii) (a) 422.6 lb./ac. (b) 201.9 lb./ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
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<th>M₈</th>
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<td>1904</td>
<td>2218</td>
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S.E. of difference of two
1. N marginal means = 86.3 lb./ac.
2. M marginal means = 101.0 lb./ac.
3. M means at the same level of N = 142.8 lb./ac.
4. N means at the same level of M = 161.6 lb./ac.

---

**Crop:** Paddy.  
**Site:** Agri. Res. Stn., Navagam.  
**Type:** Gj. 56(53).

Object:—To study the effect of time and method of application of N on the yield and growth of Paddy.

1. **BASAL CONDITIONS:**
   (i) (a) Paddy—Wheat. (b) Wheat. (c) 122 srs/ac. of manure mixture+17 srs/ac. of G.N.C.+25 srs/ac. of A.S. (ii) (a) Medium black soil. (b) Refer soil analysis, Navagam. (iii) 28.6.1956./16 to 18.8.1956. (iv) (a) N.A. (b) Transplanting. (c) —. (d) 10′×10′. (e) 1. (v) F.Y.M. at 5 C.L./ac. (vi) Pankhari—203. (vii) Irrigated. (viii) Two interculturings, and two weedings. (ix) 37.5° (x) 14, 15.11.1956.

2. **TREATMENTS:**
   Same as in expt. no. 55(45) on page 8.

3. **DESIGN:**
   (i) Split-plot. (ii) (a) 2 main-plots/block; 12 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 33′4″×18′4″. (b) 30′×15′. (v) 1′8″ round the net plot. (vi) Yes.

4. **GENERAL:**

5. **RESULTS:**
   (i) 2315 lb./ac. (ii) (a) 108.1 lb./ac. (b) 240.4 lb./ac. (iii) Main effects of N and M are highly significant. Interaction is not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
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<td>2217</td>
<td>2043</td>
<td>2173</td>
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<tr>
<td>N₂</td>
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<td>2415</td>
<td>2570</td>
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<td>2477</td>
<td>2432</td>
<td>2298</td>
</tr>
</tbody>
</table>
Crop :- Paddy (Kharif).


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

1. BASAL CONDITIONS :
   (i) (a) Paddy—Wheat. (b) Wheat. (c) 48 srs. of triple Super, 112 srs. of
         manure mixture, 80 srs. of Nitro Phos., 12 srs. of Super, 45 srs. of
         A/N and 70 srs. of A/S per acre. (ii) (a) Black soil. (b) Refer soil
         analysis, Navagam. (iii) 8.7.1957/20, 23.8.1957. (iv) (a) Two
         ploughings. (b) Transplanted. (c) —
         (d) 10'x10'. (e) 1. (v) 5 C.L./ac. of F.Y.M. (vi) Fankeri—203. (vii) Irrigated.
         (viii) Two interculturings. (ix) 13'. (x) 23 to 25.11.1957.

2. TREATMENTS :
   Same as in Expt. no. 55(45) on page 8.

3. DESIGN :
   (i) Split-plot. (ii) (a) 2 main-plots/replication ; 12 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a)
       35'x20'. (b) 30'x15'. (v) 2·5' around the net plot. (vi) Yes.

4. GENERAL :
   (i) Satisfactory ; but crop suffered due to inadequate rains. (ii) Attack of Jessids and leaf—eating
   caterpillar and blast—Dusting with gammexane. (iii) Grain and fodder yield, growth, spread, height and
   colour of leaves. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1686 lb./ac. (ii) (a) 502 lb./ac. (b) 418.6 lb./ac. (iii) None of the effects and interaction is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M_4</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>M_4</th>
<th>M_5</th>
<th>M_6</th>
<th>M_7</th>
<th>M_8</th>
<th>M_9</th>
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<td>1727</td>
<td>1485</td>
<td>1494</td>
<td>1402</td>
<td>2181</td>
<td>1600</td>
<td>1757</td>
<td>1404</td>
<td>1414</td>
<td>1800</td>
<td>1446</td>
<td>1603</td>
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<td>N_2</td>
<td>1413</td>
<td>1768</td>
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<td>1966</td>
<td>1951</td>
<td>1940</td>
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<td>2113</td>
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<td>1792</td>
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<td>Mean</td>
<td>1453</td>
<td>1747</td>
<td>1477</td>
<td>1730</td>
<td>1676</td>
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<td>1935</td>
<td>1511</td>
<td>1618</td>
<td>1723</td>
<td>1486</td>
<td>1686</td>
</tr>
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</table>

S.E. of difference of two
1. N marginal means = 102.5 lb./ac.
2. M marginal means = 209.3 lb./ac.
3. M means at the same level of N = 296.0 lb./ac.
4. N means at the same level of M = 301.4 lb./ac.

Crop :- Paddy (Kharif).


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

1. BASAL CONDITIONS :
   (i) (a) Paddy—Wheat. (b) Wheat. (c) 100 srs./ac. of triple Super+200 srs./ac. of A/S+50 srs./ac. of
         Nitro Phos. (ii) (a) Black soil. (b) Refer soil analysis, Navagam. (iii) 24.6.1958/4.5.6.8.1958. (iv)
         (a) Two ploughings. (b) Transplanting. (c) —
         (d) 10'x10'. (e) 1. (v) 5 C.L./ac. of F.Y.M. (vi) Jirasal —280. (vii) Irrigated. (viii) Three interculturings.
         (ix) 30' (x) 22,23 and 24.11.1958.
2. TREATMENTS:
Same as in exp. no. 55(45) on page 8.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots replication ; 12 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 32'-6"×18'-4". (b) 30'×15'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Rainfall was normal but irregular. Crop had leafy growth. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2406 lb./ac. (ii) (a) 273.0 lb./ac. (b) 380.1 lb./ac. (iii) Main effects of N and M are significant. 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>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
<th>M₁₀</th>
<th>M₁₁</th>
<th>M₁₂</th>
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<td>1970</td>
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<td>2067</td>
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<td>2188</td>
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<td>1897</td>
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<td>N₂</td>
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<td>2739</td>
<td>3086</td>
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<td>3088</td>
<td>2691</td>
<td>2420</td>
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<td>Mean</td>
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<td>2200</td>
<td>2398</td>
<td>2576</td>
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<td>2638</td>
<td>2504</td>
<td>2159</td>
<td></td>
<td>2406</td>
</tr>
</tbody>
</table>

S.E. of difference of two.  
1. N marginal means  = 55.7 lb./ac.  
2. M marginal means  = 190.1 lb./ac.  
3. M means at the same level of N  = 265.8 lb./ac.  
4. N means at the same level of M  = 266.2 lb./ac.

Crop :- Paddy (Kharif)  
Site :- Agri. Res. Stn., Vyara.  
Object :-To study the effect of different nitrogenous fertilizers on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) 40 lb./ac. of N.  
(ii) (a) Black soil. (b) N.A.  
(iii) 19.6.1956/19.7.1956.  
(iv) (a) N.A. (b) Transplanting.  
(c) —(d) 9'×9'. (e)— (v) F.Y.M. at 5 C.L. ac.+Super at 20 lb./ac. of P₂O₅ (vi) Z—31. (vii) Irrigated. (viii) Three weedings and 2 interculturings. (ix) N.A. (x) 1.11.1956.

2. TREATMENTS:
5 sources to supply 40 lb./ac. of N and a control, :- S₀=0, S₁=A/S, S₂=Urea, S₃=C/N, S₄=Calcium cyanamide and S₅=A/S+N.  
Fertilizers applied on 18.7.1956.

3. DESIGN:
(i) R.B.D.  
(ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 24'×36'. (b) 18'×30'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL:
(i) Lodging up to 20%. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 263 lb./ac. (ii) 326.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>Av. yield</th>
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<tr>
<td></td>
<td>2364</td>
<td>2883</td>
<td>2818</td>
<td>2263</td>
<td>2535</td>
<td>2924</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean  =163.4 lb./ac.
Crop :- Paddy (Kharif).  
Site :- Agri. Res. Stn., Vyara.  
Ref :- Gj. 57(100).  
Type :- 'M'.  
Object :-To study the effect of different nitrogenous fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Sugarcane. (c) F.Y.M. at 10 C.L./ac. +123 lb./ac. of N. (ii) (a) Black soil. (b) N.A. (iii) 25.6.1957/23.7.1957. (b) 2 ploughings and 1 harrowing. (b) Transplanting. (c) —. (d) 9'×9'.

2. TREATMENTS :  
   Same as in expt. no. 56(78) on page 11.

3. DESIGN :  
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 24'×35'. (b) 18'×33'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL :  
   (i) Very poor growth due to heavy rains. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956-1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :  
   (i) 3332 lb./ac. (ii) 264.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
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<td>Av. yield</td>
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<td>3569</td>
<td>3614</td>
<td>2934</td>
<td>3206</td>
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<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>132.1 lb./ac.</td>
</tr>
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</table>

——

Crop :- Paddy (Kharif).  
Site :- Agri. Res. Stn., Vyara.  
Ref :- Gj. 58(66).  
Type :- 'M'.  
Object :-To study the effect of different nitrogenous fertilizers on the yield of Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Sugarcane. (c) 10 C.L./ac. of F.Y.M.+123 lb./ac. of N. (ii) (a) Black soil. (b) N.A. (iii) 13.6.1958/25.7.1958. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) 9'×9'. (e) —. (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P₂O₅. (vi) Z-31. (vii) Irrigated. (viii) Two interculturings. (ix) 88°. (x) 3.11.1958.

2. TREATMENTS :  
   Same as in expt. no. 56(78) on page 11.

3. DESIGN :  
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 24'×35'. (b) 18'×30'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL :  
   (i) Very poor growth due to heavy rains. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956-1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :  
   (i) 2997 lb./ac. (ii) 180.1 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
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<tbody>
<tr>
<td>Av. yield</td>
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<td>3111</td>
<td>3101</td>
<td>2712</td>
<td>3035</td>
<td>3155</td>
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<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>90.0 lb./ac</td>
</tr>
</tbody>
</table>
Crop: Paddy (Kharif).
Object: To study the effect of different phosphatic manures on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) 5 C.L. of F.Y.M.+34 lb./ac. of N+G.M. (amount N.A.). (ii) (a) Black soil. (b) N.A. (iii) 19.6.1955/19.7.1956. (iv) (a) N.A. (b) Transplantings. (c) —. (d) 9"x9". (e) N.A. (v) 5 C.L./ac. of F.Y.M.+40 lb./ac. of N. (vi) Z—31. (vii) Irrigated. (viii) Three weedings and 2 interculturings. (ix) N.A. (x) 4.11.1956.

2. TREATMENTS:
   5 sources to give 20 lb./ac. of P₂O₅ and a control: — P₀ = 0, P₁ = Triple super, P₂ = B.M., P₃ = Dicalcium phosphate, P₄ = Hyper and P₅ = Kotka.
   Manures applied on 19.3.1956.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 24'x36'. (b) 18'x30'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—1958. (b) —. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3428 lb./ac. (ii) 180.4 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>P₅</th>
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<tr>
<td>Av. yield</td>
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<td>3529</td>
<td>3509</td>
<td>3428</td>
<td>3403</td>
<td>3272</td>
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<tr>
<td>S.E./mean</td>
<td>90.2 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).
Object: To study the effect of different phosphatic manures on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sugarcane. (c) 10 C.L./ac. of F.Y.M.+18 lb./ac. of N. (ii) (a) Black soil. (b) N.A. (iii) 25.6.1957/26.7.1957. (iv) (a) N.A. (b) Transplanting. (c) —. (d) 9"x9". (e) N.A. (v) 5 C.L./ac. of F.Y.M.+40 lb./ac. of N. (vi) Z—31. (vii) Irrigated. (viii) One interculturing. (ix) 36". (x) 1.11.1957.

2. TREATMENTS:
   Same as in exp. no. 56(77) above.
   Manures applied on 26.7.1957.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 24'x36'. (b) 18'x30'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL:
   (i) Good but heavy lodging. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3681 lb./ac. (ii) 171.2 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>P₅</th>
</tr>
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<tbody>
<tr>
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<td>3531</td>
<td>3566</td>
<td>3680</td>
<td>3793</td>
<td>3794</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>85.6 lb./ac.</td>
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<td></td>
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</table>
Crop: Paddy (Kharif).
Type: 'M'.

Object:—To study the effect of different graded doses of KNO₃ on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sugarcane. (c) 10 C.L. of F.Y.M. + 120 lb./ac. of N. (ii) (a) Black soil. (b) N.A. (iii) 23.6.1955/24.7.1955. (iv) (a) 2 ploughings and 1 harrowing. (b) Transplanting. (c) —. (d) 9' x 9'.

2. TREATMENTS:
Same as in expt. n.o. 56(77) on page 13.

3. DESIGN:
(i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) 21' x 21'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Nil. (iii) Grain and fodder yield. (iv) 1955—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) The yield suffered due to heavy rain. (vii) Nil.

5. RESULTS:
(i) 157 lb./ac. (ii) 235.0 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>P₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
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<td>2981</td>
<td>2987</td>
<td>2813</td>
<td>3110</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=152.5 lb./ac.</td>
<td></td>
<td></td>
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Crop: Paddy (Kharif).
Ref:- Gj. 55(92).
Type: 'M'.

Object:—To study the effect of graded doses of K₂O on yield and lodging of Pa ddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Same as G.M. + 5 C.L. of F.Y.M. + 30 lb./ac. of N. (ii) (a) Black soil. (b) N.A. (iii) 23.6.1955/24.7.1955. (iv) (a) Japanese method of cultivation. (b) Transplanting. (c) —. (d) 10' x 10'. (e) 4. (v) 5 C.L./ac. of F.Y.M. (vi) Z—31. (vii) Irrigated. (viii) Two interculturings. (ix) 77.97'. (x) 29.10.1955.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 doses of N and P: M₁ = 60 lb./ac. of N + 30 lb./ac. of P₂O₅ and M₂ = 120 lb./ac. of N + 60 lb./ac. of P₂O₅.
(2) 3 levels of K₂O: K₁ = 2, K₂ = 63 and K₃ = 120 lb./ac.

3. DESIGN:
(i) Fact. in R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) 15' x 35'. (b) 10' x 30'. (v) 2.5' around the net plot. (vi) Yes.

4. GENERAL:
(i) Poor; heavy lodging. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) No. (b) and (c) Nil. (v) (a) N.A. (b) Nil. (vi) Heavy rains and stitches after transplantations. (vii) Nil.

5. RESULTS:
(i) 2269 lb./ac. (ii) 290.2 lb./ac. (iii) M effect alone is highly significant. (iv) Av. yield of grain in lb./ac.
Crop: Paddy (Kharif).
Ref: Gj. 59(2).

Site: T.C.D. Farm, Chikhali.
Type: 'M'.

Object: To study the suitable time of application of N for Paddy.

1. BASAL CONDITIONS:
(i) (a) to (c) Nil. (ii) (a) Deep black soil. (b) N.A. (iii) 28.7.1959/14.8.1959. (iv) (a) 2 ploughings, 2 harrowings. (b) Transplanting. (c) —. (d) 10" × 10". (e) —. (v) 20 lb./ac. of P₂O₅ at puddling. (vi) Z—31. (vii) Un-irrigated. (viii) 2 interculturings and 2 weedings. (ix) 104.9". (x) 16.11.1959.

2. TREATMENTS:
All combinations of (1) and (2) + a control (no manure).
(1) 2 sources of 40 lb./ac. of N: S₁ = Urea and S₂ = A/s.
(2) 7 times of application of N: T₁ = Before planting, T₂ = at planting, T₃ = at tillering, T₄ = ½ before planting and ½ at tillering, T₅ = ½ at planting + ½ at tillering, T₆ = ½ before planting + ½ at tillering + ½ at one week before flowering, T₇ = ½ at planting + ½ at tillering + ½ at one week before flowering.

3. DESIGN:
(i) R.B.D. (ii) (a) 15. (b) 105' × 75'. (iii) 3. (iv) (a) 35' × 15'. (b) 30' × 10'. (v) 2.5' around. (vi) Yes.

4. GENERAL:
(i) Heavy lodging in early October 1959 due to heavy rains and strong winds which resulted in 1 to 1.5% grain loss. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1959—contd. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2232 lb./ac. (ii) 265.8 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
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<td>S₂</td>
<td>2277</td>
<td>2455</td>
<td>2043</td>
<td>2032</td>
<td>2164</td>
<td>2312</td>
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<td>Mean</td>
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<td>2188</td>
<td>2140</td>
<td>2153</td>
<td>2262</td>
<td>2146</td>
<td>2232</td>
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</table>

S.E. of S marginal means = 58.2 lb./ac.
S.E. of T marginal means = 108.9 lb./ac.
S.E. of body of table or control mean = 154.0 lb./ac.

Object:—To study the effect of different organic and inorganic manures on the yield of Paddy.
1. BASAL CONDITIONS:
(i) (a) Paddy—Wal. (b) and (c) N.A. (ii) (a) Deep black; clay to clay loam. (b) N.A. (iii) 13.8.1959. (iv) (a) 2 harrowings. (b) Transplanting. (c)—. (d) $10^5 \times 10^6$. (e) 4. (v) Nil. (vi) Z—31. (vii) Unirrigated. (viii) 2 interculturations and 2 hand weedings. (ix) 104.9$. (x) 17.11.1959.

2. TREATMENTS:
All combinations of (1), (2), (3) and (4)
(1) 3 levels of N: $N_0=0$, $N_1=30$ and $N_2=60$ lb./ac.
(2) 3 levels of $P_0$: $P_0=0$, $P_1=30$ and $P_2=60$ lb./ac.
(3) 3 levels of $K_0$: $K_0=0$, $K_1=30$ and $K_2=60$ lb./ac.
(4) 2 levels of F.Y.M.: $F_0=0$ and $F_1=5000$ lb./ac.
Sources, time and method of application N.A.

3. DESIGN:
(i) $3^5 \times 2$ Fact. confid. (ii) (a) 9 plots/block; 6 blocks/replication. (b) 105' x 45'. (iii) 1. (iv) (a) 35' x 15'. (b) 30' x 10'. (v) $2.5'$ around. (vi) Yes.

4. GENERAL:
(i) Crop was heavily lodged in early Oct. 1959 due to heavy rains and strong winds which resulted in 1 to 1.5% grain loss. (ii) Nil. (iii) No. of tillers, height, grain and fodder yield. (iv) (a) 1959—cond. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2051 lb./ac. (ii) 175.8 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>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$K_0$</th>
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<td>$F_1$</td>
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<td>2109</td>
<td>2145</td>
<td>2119</td>
<td>2085</td>
<td>2101</td>
<td>2126</td>
<td>2182</td>
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<tr>
<td>Mean</td>
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<td>2085</td>
<td>2027</td>
<td>2069</td>
<td>2052</td>
<td>2031</td>
<td>2003</td>
<td>2057</td>
<td>2092</td>
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<td>2094</td>
<td>2002</td>
<td>1913</td>
<td></td>
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<tr>
<td>$K_1$</td>
<td>2046</td>
<td>2115</td>
<td>2009</td>
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<td>2045</td>
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<td>$K_2$</td>
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<td>2071</td>
<td>2097</td>
<td>2045</td>
<td>2135</td>
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<td>2167</td>
<td>2091</td>
<td>1950</td>
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<tr>
<td>$P_1$</td>
<td>2039</td>
<td>2076</td>
<td>2039</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>$P_2$</td>
<td>1913</td>
<td>2087</td>
<td>2093</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

S.E. of marginal means of N, P or K = 41.4 lb./ac.
S.E. of marginal means of F = 33.8 lb./ac.
S.E. of body of $N \times P$, $N \times K$ or $P \times K$ tables = 71.8 lb./ac.
S.E. of body of $F \times N$, $F \times P$ or $F \times K$ tables = 58.6 lb./ac.

Crop :- Paddy (Kharif).
Site :- T.C.D. Farm, Bardoli.
Objecet :- To find out the response of different varieties to N and P manuring.

1. BASAL CONDITIONS:
(i) (a) Paddy—boof, Sann—Paddy. (b) Paddy. (c) 5 C.L. lb./ac. of F.Y.M.+300 lb./ac. G.N.C.+100 lb./ac. A/S+100 lb./ac. of Super. (ii) (a) Deep black soil. (b) Refer soil analysis, Bardoli. (iii) 31.7.1959 1.8.1959. (iv) (a) One ploughing. (b) Transplanting. (c)—. (d) $10^5 \times 10^6$. (e) 2 to 3. (v) 5 C.L./ac. of F.Y.M. broadcasted. (vi) As per treatments. (vii) Irrigated. (viii) Two Interculturations. (ix) 100$. (x) 7 and 25.11.1959.
2. TREATMENTS :

Main-plot treatments
4 varieties: V1=Kanda-176-12, V2=Zenia-31, V3=E.K.-70 and V4=K-42.

Sub-plots treatments
All combinations of (1) and (2).
(1) 2 levels of N: N0=0 and N1=40 lb./ac.
(2) 2 levels of P2O5: P0=0 and P1=20 lb./ac.

3. DESIGN :

(i) Split-plot. (ii) 4 main-plots/block; 4 sub-plots/main-plot. (iii) 36'x21' (iv) All round the net plot. (vi) Yes.

4. GENERAL :

(i) Good. (ii) One spraying of Foliodol-605 to control Rice hispa and leaf caterpillars. (iii) Grain and fodder yield. (iv) (a) 1959-contd. (b) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 1709 lb./ac. (ii) (a) 243.0 lb./ac. (b) 184.4 lb./ac. (iii) N effect alone is highly significant. (iv) Av yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>990</td>
<td>1105</td>
<td>999</td>
<td>1227</td>
<td>1080</td>
</tr>
<tr>
<td>N1</td>
<td>2268</td>
<td>2353</td>
<td>2313</td>
<td>2418</td>
<td>2338</td>
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<tr>
<td>Mean</td>
<td>1629</td>
<td>1729</td>
<td>1656</td>
<td>1823</td>
<td>1709</td>
</tr>
<tr>
<td>P0</td>
<td>1659</td>
<td>1669</td>
<td>1636</td>
<td>1831</td>
<td>1699</td>
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<tr>
<td>P1</td>
<td>1599</td>
<td>1789</td>
<td>1675</td>
<td>1814</td>
<td>1719</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 60.7 lb./ac.
2. N or P marginal means = 46.1 lb./ac.
3. N or P means at the same level of V = 92.2 lb./ac.
4. V or P means at the same level of N or P = 107.8 lb./ac.
5. S.E. of body of N x P table = 46.1 lb./ac.

Crop :- Paddy (Kharif).
Site :- Agri. Res. Sta., Halvad.

Object :- To find out the most suitable spacing for Paddy crop.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Cotton. (c) Nil. (d) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 7.7.54.
(iv) (a) Ploughing, 2 harrowings and intercultures. (b) Drilling. (c) 40 lb./ac. (d) As per treatments. (e) —.
(v) 8 lb./ac. of P2O5 at sowing. 40 lb./ac. of N as A/S and manure mixture applied as two top dressings.

2. TREATMENTS :

1. 9" spacing between two lines.
2. 18" spacing between two lines.

3. DESIGN :

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 51'x18'. (b) 45'x12'. (v) All round the net plot. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 1249 lb./ac.  (ii) 137.5 lb./ac.  (iii) Treatment difference is not significant.  (iv) Av. yield of grain in lb./ac.

Treatments  
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
</table>
Av. yield | 1275 | 1222 |

S.E./mean = 56.1 lb./ac.

---

**Crop:** Paddy (Kharif).
**Site:** Agri. Res. Stn., Halvad.

Object:—To find out the most suitable spacing for Paddy crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 30.6.1955.  
(iv) (a) Two ploughings and 3 harrowings. (b) Drilling. (c) 40 lb./ac.  
(d) As per treatments. (e) N.A.  
(v) 200 lb./ac. of manure mixture and 200 lb./ac. of P₂O₅.  

2. TREATMENTS:

Same as in expt. no. 54(46) on page 17.

3. DESIGN:

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 5' × 12'. (b) 45' × 6'. (v) 3' all round the plot. (vi) Yes.

4. GENERAL:

(i) Not satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 683 lb./ac.  (ii) 195.4 lb./ac.  (iii) Treatment difference is significant.  (iv) Av. yield of grain in lb./ac.

Treatments  
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
</table>
Av. yield | 836 | 530 |

S.E./mean = 79.8 lb./ac.

---

**Crop:** Paddy (Kharif).
**Site:** Agri. Res. Stn., Halvad.

Object:—To find out the most suitable spacing for Paddy crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Sann (G.M.). (c) 100 lb./ac. of Super. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 26.6.1957.  
(iv) (a) Ploughing and harrowing. (b) and (c) N.A.  
(d) As per treatments. (e) N.A.  
(v) 400 lb. of A/S applied in four equal doses at sowing one month, two months and 2½ months after sowing. (vi) Local. (vii) Irrigated. (viii) Interculturing and weeding. (ix) 15°. (x) N.A.

2. TREATMENTS:

Same as in expt. no. 54(46) on page 17.

3. DESIGN:

(i) Paired-plot. (ii) (a) 2. (b) N.A. (iii) 8. (iv) (a) 36' × 18'. (b) 30' × 6'. (v) 3' × 6'. (vi) Yes.

4. GENERAL:

(i) Satisfactory. No lodging. (ii) Nil. (iii) Height of plants; no. of tillers, length of ear heads and grain yield. (iv) (a) 1954—1957. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 822 lb./ac. (ii) 113.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>826</td>
<td>818</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-39.95 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif),

Object: To find out the most suitable date of sowing for Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) As per treatments. (iv) (a) One ploughing and 1 harrowing. (b) Drilling. (c) 40 lb./ac. (d) 18°. (e) N.A. (v) 300 lb. of N as A/S + 200 lb./ac. of P₂O₅. (vi) Junagadh (local). (vii) Irrigated. (viii) Three interculterings. (ix) 13.75°. (x) 20.9.1955, 28.9.1955, 6.10.1955, 14.10.1955 and 26.10.1955 according to date of sowing.

2. TREATMENTS:

3. DESIGN:
(i) L. S. (ii) 5. (b) N.A. (iii) 5. (iv) (a) 5' × 18'. (b) 45' × 12'. (v) 3' all round the net plot. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1762 lb./ac. (ii) 181.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>D₅</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>2339</td>
<td>2363</td>
<td>2004</td>
<td>1270</td>
<td>832</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-81.31 lb./ac.</td>
<td></td>
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</table>

Crop: Paddy (Kharif),

Object: To find out the most suitable dates of sowing for Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) M.g. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) As per treatments. (iv) (a) Two ploughings and 1 harrowing. (b) Drilling. (c) 40 lb./ac. (d) 18°. (e) N.A. (v) 100 lb./ac. of manure mixture at sowing + 203 lb. of manure mixture top dressed. (vi) Junagadh (local). (vii) Irrigated. (viii) Two interculterings. (ix) 33.75°. (x) D₁ on 14, 17.9.1956, D₄ on 3, 7.10.1956, D₅ on 3 and on 31.10.1956.

2. TREATMENTS:
3. **DESIGN:**
(i) L. Sq.  (ii) (a) 5.  (b) N.A.  (iii) 5.  (iv) (a) 51'×18'.  (b) 45'×12'.  (v) 3' all round the plot.  (vi) Yes.

4. **GENERAL:**
(i) Poor.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1955—N.A.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) Crop growth and vigour was poor due to lack of rains and non availability of canal water.  (vii) Nil.

5. **RESULTS:**
(i) 378 lb./ac.  (ii) 100.6 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>575</td>
<td>224</td>
<td>213</td>
<td>472</td>
<td>407</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td>102.7 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

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**Crop :- Paddy (Kharif).**  
**Site :- Agri. Res. Stn., Halvad.**  
Ref :- Gj. 57(36).  
Type :- 'C'.

Object :-To find out the most suitable dates of sowing for Paddy.

1. **BASAL CONDITIONS:**
(i) (a) Nil.  (b) Sann (G.M.).  (c) 16 lb./ac. of P2O5.  (ii) (a) Medium black.  (b) Refer soil analysis, Halvad.  (iii) As per treatments.  (iv) (a) Ploughing and harrowing.  (b) to (e) N.A.  (v) 300 lb./ac. of A/S applied in three equal doses at sowing, tillering and flowering.  (vi) Junagadh (local).  (vii) Irrigated.  (viii) Nil.  (ix) 15".  (x) D1 on 27.9.1957 ; D2 on 1.10.1957 ; D3 on 12.10.1957 ; D4 and D5 on 27.10.1957.

2. **TREATMENTS :**
5 dates of sowing: D1 =15.5.1957, D2 =1.6.1957, D3 =15.6.1957, D4 =1.7.1957 and D5 =15.7.1957.

3. **DESIGN :**
(i) L. Sq.  (ii) (a) 5.  (b) N.A.  (iii) 5.  (iv) (a) 40'×14'.  (b) 34'×7½'.  (v) 3'×3½'.  (vi) Yes.

4. **GENERAL:**
(i) Not good in D1 and D3 plots due to draught in August/September.  Moderate lodging in all treatments.  (ii) Nil.  (iii) Height of plant, no. of tillers, no. of grains per earhead, length of ear head and grain yield.  (iv) (a) 1955—N.A.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. **RESULTS :**
(i) 885 lb./ac.  (ii) 229.7 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>550</td>
<td>579</td>
<td>820</td>
<td>1115</td>
<td>1361</td>
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<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td>102.7 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

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**Crop :- Paddy (Kharif).**  
**Site :- Agri. Res. Stn., Halvad.**  
Ref :- Gj. 58(25).  
Type :- ‘C’.

Object :-To find out the most suitable dates of sowing for Paddy.

1. **BASAL CONDITIONS :**
(i) (a) Legume—cereal—cotton.  (b) Cotton.  (c) Nil.  (ii) (a) Medium black.  (b) Refer soil analysis, Halvad.  (iii) As per treatments.  (iv) (a) One harrowing.  (b) Drilling.  (c) 40 lb./ac.  (d) 18".  (e) —.  (v) 20 C.L./ac. of compost ; 100 lb./ac. of P2O5 and 300 lb./ac. of A/S.  (vi) Junagadh (local).  (vii) Irrigated.  (viii) Two weedings and 1 interculturing.  (ix) 13°.  (x) 25.9.1958 to 29.10.1958.
2. TREATMENTS:

3. DESIGN:
(i) L. Sq.  (ii) 5. (b) N.A.  (iii) 5.  (iv) (a) 40'×14'. (b) 34'×7½'. (v) 3'×3.5'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A.  
(vi) Nil. (vii) As the plan of the exp. is not available, the exp. is analysed as R.B.D.

5. RESULTS:
(i) 1466 lb./ac.  (ii) 231.5 lb./ac.  (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>D₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1475</td>
<td>1373</td>
<td>2192</td>
<td>1559</td>
<td>1033</td>
</tr>
</tbody>
</table>

S.E./mean =103.5 lb./ac.

Crop :- Paddy. (Kharif).

Ref :- Gj. 56(118).
Type :- 'C'.

Object.—To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) to (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 19-7.1956. (iv) (a) N.A. (b) As per treatments.  
(c) N.A.  (d) As per treatments. (e) N.A. (f) Nil. (g) N.A.  (h) Unirrigated. (i) N.A.  (j) 29.03'. (k) 2.12.1956.

2. TREATMENTS:
1. Transplanting one month old seedlings with 9"×9" spacing.
2. Drilling paddy with rows 9" apart and thinning to 9" spacing between plants.
3. Drilling paddy with rows 9" apart without thinning (Local practice).

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A.  (iii) 6. (iv) (a), (b) and (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A.  (iii) Grain yield. (iv) (a) and (b) N.A. (c) Nil. (v) N.A.  (vi) Nil. (vii) Plot-wise data is not available.

5. RESULTS:
(i) 2039 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>1</th>
<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2374</td>
<td>2167</td>
<td>1575</td>
</tr>
</tbody>
</table>

S.E./mean =N.A.

Crop :- Paddy( Kharif).
Site :- Central Exptl. Farm, Junagadh.

Ref :- Gj. 56(45).
Type :- 'C'.

Object.—To find out the economic spacing and seed rate for Paddy.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Guar. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 27-6.1956.  
(iv) (a) N.A. (b) Drilling. (c) As per treatments. (d) Between rows as per treatments. Between plants—irregular.  
(v) Farm compost at 10 C.L./ac. and 30 lb./ac. of N as paddy mixtures in three doses. (vi) M.S. 3 (Bhimdi type ; medium). (vii) Irrigated. (viii) Two weedings and 4 intercultures  
(ix) 59-56'. (x) 14 and 21.10.1956.
2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 spacings between rows: \( R_1 = 9", R_2 = 12", R_3 = 15" \) and \( R_4 = 18" \) double rows.
(2) 3 seed rates: \( S_1 = 20, S_2 = 30 \) and \( S_3 = 40 \) lb./ac.
Double rows—two rows were sown side by side keeping 15" spacing between two inner rows.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) and (b) N.A. (iii) 4. (iv) (a) 15' × 9'. (b) 10' × 6'. (v) 2½' × 1½'. (vii) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Attack of paddy blast; No control measures. (iii) Height, spread and grain yield.
(iv) (a) 1956—contd. (modified in 1957). (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1605 lb./ac. (ii) 355.7 lb./ac. (iii) R effect alone 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>1720</td>
<td>1491</td>
<td>1401</td>
<td>1537</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>1978</td>
<td>1324</td>
<td>1591</td>
<td>1631</td>
</tr>
<tr>
<td>( S_3 )</td>
<td>1945</td>
<td>1467</td>
<td>1530</td>
<td>1647</td>
</tr>
</tbody>
</table>

Mean \( = 1881 \)
Mean \( = 1427 \)
Mean \( = 1507 \)
Mean \( = 1605 \)

S.E. of any marginal mean = 102.7 lb./ac.
S.E. of body of table = 177.9 lb./ac.

Object:—To find out the optimum spacing and seed rate for drilled Paddy.

1. BASAL CONDITIONS:
(i) 'a' Nil. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 15.6.1957. (iv) 'a', One ploughing and 2 harrowings. (b) Drilling. (c) As per treatments. (d) Between rows—as per treatments; between plants—irregular. (e) —. (v) F.C. at 20 C.L./ac. (vi) S—29 (medium). (vii) Irrigated. (viii) Two weedings and 3 intercultures. (ix) 30.21°. (x) 10, 11.10.1957.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 spacings between rows: \( R_1 = 9", R_2 = 12", R_3 = 15" \) and \( R_4 = 18" \).
(2) 3 seed rates: \( S_1 = 20, S_2 = 30 \) and \( S_3 = 40 \) lb./ac.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 20' × 15'. (b) 16' × 12' for \( R_1, R_2 \) and \( R_4 \) and 16' × 12½' for \( R_3 \). (v) 2½' × 1½' for \( R_1, R_2 \) and \( R_4 \) and 2' × 1½' for \( R_3 \). (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Attack of Paddy blast; control measures N.A. (iii) Grain yield. (iv) (a) 1956—contd. (modified in 1957). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2117 lb./ac. (ii) 195.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.
Crop :- Paddy (Kharif).


Object :- To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Medium. (b) N.A. (iii) 24.6.1954. (iv) (a) One ploughing and 1 harrowing. (b) to (e) N.A. (v) Nil. (vi) Local (medium). (vii) Irrigated. (viii) Three weedings and 2 intercultur­es. (ix) N.A. (x) 13.10.54.

2. TREATMENTS:
   1. Local method of sowing.
   2. Improved method of sowing. (drilling).
   3. Improved method of sowing (transplanting).
   Other details-N.A.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 13'x9' - (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) N.A. (iii) Grain yield. (iv) (a) 1954-1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Plot wise yield is not available.

5. RESULTS:
   (i) 1932 lb./ac. (ii) N.A. (iii) N.A. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th>Treatment</th>
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<tr>
<td>Av. yield</td>
<td>1492</td>
<td>2430</td>
<td>1875</td>
</tr>
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</table>

S.E./mean = N.A.

Crop :- Paddy (Kharif).


Object :- To find out the optimum seed rate for different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 20.6.1957. (iv) (a) N.A. (b) Hand sowing. (c) As per treatments. (d) 18” between rows. (e) N.A. (v) 20 lb./ac. of N as A/S. (vi) As per treatments. (vii) Irrigated. (viii) Three weedings and 1 interculturing. (ix) 34’. (x) 9.11.1957.

2. TREATMENTS:
   4 varieties : V₁=S−57, V₂=S−152, V₃=S−309 and V₄=local.
   4 seed rates : S₁=15, S₂=20, S₃=25 and S₄=30 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) 12'×18'. (b) 9'×15'. (v) 1.5' all round the net plot. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 943 lb./ac. (ii) (a) 156.6 lb./ac. (b) 129.7 lb./ac. (iii) All the effects are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
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<th>S₃</th>
<th>S₄</th>
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<td>715</td>
<td>907</td>
<td>870</td>
<td>848</td>
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<td>Mean</td>
<td>1060</td>
<td>966</td>
<td>840</td>
<td>905</td>
<td>943</td>
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</table>

S.E. of difference of two
1. V marginal means = 39.2 lb./ac.
2. S marginal means = 32.4 lb./ac.
3. S means at the same level of V = 91.7 lb./ac.
4. V means at the same level of S = 96.8 lb./ac.

Crop :- Paddy (Kharif).
Site :- Trial-cum-Demonstration Farm, Bardoli.
Ref :- Gj. 59(66).
Type :- 'CM'.

Object :- To study the effects of graded doses of N, P and K with different spacings on Paddy.

1. BASAL CONDITIONS:
(i) (a) Paddy—wal, sann—paddy. (b) Paddy. (c) 10 C.L./ac. of F.Y.M. (ii) (a) Deep black. (b) Refer soil analysis, Bardoli. (iii) 21, 22.7.1959. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) Between plants 6" and between rows : as per treatments. (e) 2 to 3. (v) Nil. (vi) Z—31. (vii) Irrigated. (viii) Two interculturings and 3 weedings. (ix) 100". (x) 10.11.1959.

2. TREATMENTS:
All combinations of (1), (2), (3) and (4)
(1) 3 levels of N : N₀=0, N₁=40 and N₂=80 lb./ac.
(2) 3 levels of P₂O₅ : P₀=0, P₁=40 and P₂=80 lb./ac.
(3) 3 levels of K₂O : K₀=0, K₁=40 and K₂=80 lb./ac.
(4) 3 spacings between rows : R₁=6", R₂=9" and R₃=12".

3. DESIGN:
(i) 34 confounded. (ii) (a) 9 plots/block; 9 blocks/rep. (b) N.A. (iii) 1. (iv) (a) 18'×24'. (b) 12'×21'. (v) 3'×1.5'. (vi) Yes.

4. GENERAL:
(i) Due to heavy rains, the growth was hampered to a certain extent. (ii) Nil. (iii) Grain and fodder yield (iv) (a) 1956—contd. (b) —. (c) Nil. (v) (a) Ch. khali. (b) Nil. (vi) Heavy rains. (vii) Nil.

5. RESULTS:
(i) 2513 lb./ac. (ii) 274.9 lb./ac. (iii) Main effect of N acre is highly significant. (iv) Av. yield of grain in lb./ac.
Crop :- Paddy (Kharif).
Site :- Trial-cum-Demonstration Farm, Chikhli.

Ref :- Gj. 59(85).
Type :- 'CM'.

Object :- To study the effect of graded doses of N, P, K and different spacings on Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Deep black. (b) N.A. (iii) 2.8.1959 and 14.8.1959. (iv) (a) N.A. (b) Transplanting. (c) —. (d) Between plants : 6" ; between rows : as per treatments. (e) N.A. (f) Nil. (vi) Z-31. (vii) Unirrigated. (viii) Two hand weedings. (ix) 104.9". (x) 11.11.1959 to 14.11.1959.

2. TREATMENTS :
   Same as in expt. no. 59(66) on page 24.

3. DESIGN :
   (i) 34 confounded. (ii) (a) 9 plots/block ; 9 blocks/rep. (b) 72' X 54'. (iii) I. (iv) (a) 24' X 18'. (b) 18' X 12'. (v) 3' alround the net plot. (vi) Yes.

4. GENERAL :
   (i) Crop was lodged due to heavy rains in Oct. 1959. The plants in some of the plots were dead. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1959—contd. (b) —. (c) Nil. (v) (a) Bardoli. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1628 lb./ac. (ii) 715.7 lb./ac. (iii) Effect of N alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P_0</th>
<th>P_1</th>
<th>P_2</th>
<th>K_0</th>
<th>K_1</th>
<th>K_2</th>
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<th>R_1</th>
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<td>1900</td>
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<td>779</td>
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<td>1523</td>
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<td>1202</td>
<td>1903</td>
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<td>1664</td>
<td>1759</td>
<td>1597</td>
<td>1664</td>
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</tbody>
</table>

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* S.E. of any marginal mean = 52.9 lb./ac.
* S.E. of body of any table = 91.6 lb./ac.
Object: To find out suitable spacing and manurial dose for early Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Medium black. (b) Refer soil analysis, Dabhoi. (iii) 28 to 30.8.1957. (iv) (a) N.A. (b) Transplanting. (c) N.A. (d) As per treatments. (e) 3 to 4. (v) 5 C.L. ac. of F.Y.M. (vi) E.K. 70. (vii) Irrigated. (viii) N.A. (ix) 56.95°. (x) 21 to 22.11.1957.

2. TREATMENTS:
   Main-plot treatments
   4 spacings: S1 = 6'x6', S2 = 12'x6', S3 = 10'x10' and S4 = 12'x12'.
   Sub-plot treatments
   5 doses of manures: M1 = 0, M2 = 30, M3 = 60, M4 = 90 lb./ac. of N and M5 = 60 lb./ac. of N + 30 lb./ac. of P2O5.
   N as A/S broadcasted in two equal doses on 29.8.1959 and 29.9.1959.

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**Crop:** Paddy (Kharif)

**Site:** Agri. Res. Stn., Dabhoi.

Object: To compare different methods of Paddy cultivation.

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**Crop:** Paddy (Kharif)

**Site:** Agri. Res. Stn., Dabhoi.

Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

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Object: To compare different methods of Paddy cultivation.

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Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

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Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

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Crop: Paddy (Kharif)


Object: To compare different methods of Paddy cultivation.

---

Crop: Paddy (Kharif)

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' x 20'.
   (b) 15' x 15'. (v) 2.5' all round the plot. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (The experiment failed in
   1956). (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2930 lb./ac. (ii) (a) 371.6 lb./ac. (b) 347.6 lb./ac. (iii) M effect alone is significant. (iv) Av. yield of
   grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
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<th>S3</th>
<th>S4</th>
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</table>

Mean 2963 2989 2935 2835

S.E. of difference of two
   1. S marginal means = 117.5 lb./ac.
   2. M marginal means = 122.9 lb./ac.
   3. M means at the same level of S = 245.9 lb./ac.
   4. S means at the same level of M = 249.4 lb./ac.

---

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

**Site:** Agr. Res. Stn., Dabhoi.

**Ref:** Gj. 58(6).

**Type:** ‘CM’

Object:—To find out suitable spacing and manurial dose for early Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Medium black. (ii) Refer soil analysis, Dabhoi.
   (iii) 27.6.1958/14 and 16 to 18.8.1958. (iv) (a) Four ploughings and 2 harrowings. (b) Transplanting.
   (c) N.A. (d) As per treatments. (e) 3 to 4. (v) 5 C.L./ac. of F.Y.M. (vi) E.K-70. (vii) Irrigated. (viii) One:
   intercultering. (ix) 57". (x) 1 to 4.11.1958.

2. TREATMENTS:
   Same as in Expt. no. 57(13) on page 26.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20' x 20'.
   (b) 15' x 15'. (v) 2.5' all round the plot. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Attack of stem-borer. (iii) Tillering, grain and fodder yield. (iv) (a) 1956—contd. (The experiment failed in 1956). (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2405 lb./ac. (ii) (a) 485.2 lb./ac. (b) 277.6 lb./ac. (iii) None of the effects is significant. (iv) Av.
   yield of grain in lb./ac.
Crop :- Paddy (Kharif).
Site :- Agri. Res. Sta., Dabhoi.
Object :- To find out suitable spacing and manurial dose for Paddy.

Ref :- Gj. 59(59).
Type :- 'CM'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Dabhoi. (iii) 18.6.1959/23.8.1959. (iv) (a) Three ploughings and 3 harrowings. (b) Transplanting. (c) - - (d) As per treatments. (e) N.A. (f) 8 C.L-ac. of F.Y.M. (vi) E.K-70. (vii) Unirrigated. (viii) Three interculturings. 1r, 56.98". (x) 12.11.1959.

2. TREATMENTS:
Same as in Expt. no. 57 (13) on page 26.

3. DESIGN:
(i) (a) N.A. (ii) 4 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 20'X20'. (b) 15'X15'. (v) 2.5' all round the plot. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1703 lb./ac. (ii) (a) 697.7 lb./ac. (b) 454.8 lb./ac. (iii) S and M effects are highly significant. Interaction is not significant. (iv) Av. yields of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
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<td>1167</td>
<td>914</td>
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<td>1660</td>
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<td>1961</td>
<td>2041</td>
<td>1511</td>
<td>2055</td>
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<tr>
<td>M_4</td>
<td>2320</td>
<td>1868</td>
<td>1687</td>
<td>1386</td>
<td>1815</td>
</tr>
</tbody>
</table>

Mean : 2180 1642 1588 1404 1703

S.E. of difference of two.
1. S marginal means = 192.2 lb./ac.
2. M marginal means = 160.8 lb./ac.
3. M means at the same level of S = 321.6 lb./ac.
4. S means at the same level of M = -346.0 lb./ac.
Object:—To find out the optimum spacing, manurial requirements and intercultures for Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) 10 C.L./ac. of F.Y.M. (ii) (a) Medium black soil. (b) Refer soil analysis, Dabhoi. (iii) 23 and 25.7.1954. (iv) (a) N.A. (b) As per treatments. (c) 60 lb./ac. for drilling. (d) As per treatments. (e) 6 seeds/dibble. (f) 5 C.L./ac. of F.Y.M. (vi) E.K.-70. (vii) Unirrigated. (viii) Two weedings. (ix) 41.92". (x) 6.11.54.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment No.</th>
<th>Method of sowing</th>
<th>Spacing</th>
<th>N in lb./ac.</th>
<th>P2O5 in lb./ac.</th>
<th>No. of intercultures</th>
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<tbody>
<tr>
<td>1.</td>
<td>Drilling</td>
<td>15&quot;</td>
<td>64</td>
<td>32</td>
<td>3 one way</td>
</tr>
<tr>
<td>2.</td>
<td>Drilling</td>
<td>15&quot;</td>
<td>100</td>
<td>80</td>
<td>3 one way</td>
</tr>
<tr>
<td>3.</td>
<td>Drilling</td>
<td>12&quot;</td>
<td>64</td>
<td>32</td>
<td>3 one way</td>
</tr>
<tr>
<td>4.</td>
<td>Drilling</td>
<td>12&quot;</td>
<td>100</td>
<td>80</td>
<td>3 one way</td>
</tr>
<tr>
<td>5.</td>
<td>Dibbling</td>
<td>9&quot;x9&quot;</td>
<td>64</td>
<td>32</td>
<td>3 one way</td>
</tr>
<tr>
<td>6.</td>
<td>Dibbling</td>
<td>9&quot;x9&quot;</td>
<td>100</td>
<td>80</td>
<td>3 one way</td>
</tr>
<tr>
<td>7.</td>
<td>Dibbling</td>
<td>9&quot;x9&quot;</td>
<td>64</td>
<td>32</td>
<td>3 two ways</td>
</tr>
<tr>
<td>8.</td>
<td>Dibbling</td>
<td>9&quot;x9&quot;</td>
<td>100</td>
<td>80</td>
<td>3 two ways</td>
</tr>
<tr>
<td>9.</td>
<td>Drilling</td>
<td>15&quot;</td>
<td>64</td>
<td>32</td>
<td>5 one way</td>
</tr>
<tr>
<td>10.</td>
<td>Drilling</td>
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<td>100</td>
<td>80</td>
<td>5 one way</td>
</tr>
<tr>
<td>11.</td>
<td>Drilling</td>
<td>12&quot;</td>
<td>64</td>
<td>32</td>
<td>5 one way</td>
</tr>
<tr>
<td>12.</td>
<td>Drilling</td>
<td>12&quot;</td>
<td>100</td>
<td>80</td>
<td>5 one way</td>
</tr>
<tr>
<td>13.</td>
<td>Dibbling</td>
<td>9&quot;x9&quot;</td>
<td>64</td>
<td>32</td>
<td>5 one way</td>
</tr>
<tr>
<td>14.</td>
<td>Dibbling</td>
<td>9&quot;x9&quot;</td>
<td>100</td>
<td>80</td>
<td>5 one way</td>
</tr>
<tr>
<td>15.</td>
<td>Dibbling</td>
<td>9&quot;x9&quot;</td>
<td>64</td>
<td>32</td>
<td>5 two ways</td>
</tr>
<tr>
<td>16.</td>
<td>Dibbling</td>
<td>9&quot;x9&quot;</td>
<td>100</td>
<td>80</td>
<td>5 two ways</td>
</tr>
</tbody>
</table>


Due to unfavourable weather conditions only one interculture could be given to all plots, instead of 3 and 5 as per treatments. Hence effective no. of treatments is 8 only.

3. DESIGN:

(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 3 (Expt. was originally planned with 4 rep. but as most of the plots in repl. III were situated in poor soil, hence replication III has been dropped from analysis). (iv) (a) 15"x33'. (b) 9'x30' for 9"x9" and 12" spacing; 10'x27' for 15" spacing. (v) 9"x9" spacing: 4 rows on each side and 11' at each end; 12" spacing: 3 rows on each side and 11' at each end and 15" spacing: 2 rows on each side and 3' at each end. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Height, no. of tillers and grain yield. (iv) (a) 1954-1955. (b) No. (c) Nil. (v) (a) Amreli. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 1291 lb./ac. (ii) 204.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain 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>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1466</td>
<td>1110</td>
<td>1459</td>
<td>1651</td>
<td>1210</td>
<td>1055</td>
<td>1291</td>
<td>1089</td>
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<tr>
<td>S.E./mean</td>
<td>83.6 lb./ac.</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Object:—To find out the optimum spacing, manurial requirements and intercultures for Paddy.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Black soil. (b) Refer soil analysis, Dabhoi. (iii) 30.6.1955. (iv) (a) N.A. (b) As per treatments. (c) 60 lb./ac. for drilled paddy. (d) As per treatments. (e) 6 seeds/dibble. (f) 5 C.L./ac. of F.Y.M. on 29.5.1955. (vi) E.K.-70. (vii) Irrigated. (viii) Two weedings. (ix) 51.18". (x) 28.10.1955.
2. TREATMENTS:
Same as in Expt. no. 54(29) on page 29.

3. DESIGN:
(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 15' x 33'. (b) 9' x 30' for 9' x 9' and 12' spaced plots; 10' x 27' for 15' spaced plots. (v) Same as in Expt. no. 54(29) on page 29. (vi) Yes.

4. GENERAL:
(i) Lodging in the whole experiment due to heavy rains at flowering. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) (a) Amreli. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2114 lb./ac. (ii) 375.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain 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>
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<tr>
<td>Av. yield</td>
<td>2205</td>
<td>1911</td>
<td>2191</td>
<td>1791</td>
<td>2367</td>
<td>2002</td>
<td>2593</td>
<td>1850</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>132.9 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Crop :- Paddy (Kharif).
Ref :- Gj. 57 (123).
Type :- 'CM'.

Object :- To compare different methods of Paddy cultivation.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sann for G.M. (c) 16 lb./ac. of P2O5. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 6 and 10.7.1957. (iv) (a) Nil. (b) As per treatments. (c) 40 lb./ac. for drilled paddy and 15 lb./ac. for transplanted paddy. (d) 18' x 3'. (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Three intercultures and 4 weedings. (ix) 15.09'. (x) 14 and 20.10.1957.

2. TREATMENTS:
4 methods of cultivation : C1=Local, drilling, without fertilizers, C2=Japanese, drilling, with fertilizers, C3=Japanese, transplanting, with 320 lb./ac. mixture + 50 lb./ac. A/S + 375 lb./ac. Super and C4=Wave shaped, transplanting.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 36' x 10'. (b) 30' x 6'. (v) 3' x 2'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) As plot-wise yield data is not available, statistical analysis could not be carried out.

5. RESULTS:
(i) 2321 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1229</td>
<td>2700</td>
<td>2534</td>
<td>2460</td>
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<tr>
<td>S.E./mean</td>
<td>N.A.</td>
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Crop :- Paddy (Kharif).
Ref :- Gj. 58(113).
Type :- 'CM'.

Object :- To study the effect of spacing, seed rate and date of sowing along with N and P2O5 on Paddy crop.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Groundnut and gram. (c) Nil.  
   (ii) (a) Medit: mun black. (b) Refer soil analysis, Junagadh.
   (iii) As per treatments.  
   (iv) (a) Nil. (b) Drilling. (c) and (d) As per treatments.  
   (v) 15 C.L./ac. of F.Y.M.  
   (vi) S-29. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1), (2) and (3)
   (2) 3 spacings between rows: S1 = 9", S2 = 12" and S3 = 18".
   (3) 3 seed rates: R1 = 20, R2 = 30 and R3 = 40 lb./ac.

   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 2 levels N as A/S: N0 = 0 and N1 = 40 lb./ac.
   (2) 2 levels of P2O5 as Super: P0 = 0 and P1 = 30 lb./ac.

3. DESIGN:
   (i) 3x4 confounded in split-plot. (ii) (a) 3 blocks/block, 5 main-plots/block and 4 sub-plots/main-plot.
   (b) N.A. (iii) l. (iv) (a) 22'x15'. (b) 18'x12'. (v) 2'x1.5'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 195 growing period. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1229 lb./ac. (ii) (a) 120.2 lb./ac. (b) 148.6 lb./ac. (iii) Effect of D, N, P and interaction D×N are highly significant. Interaction D×P is significant. Other effects are 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>R1</th>
<th>R2</th>
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<th>S2</th>
<th>S3</th>
<th>P0</th>
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<td>1099</td>
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</tbody>
</table>

   S.E. of difference of two
   1. D, S or R marginal means = 28.3 lb./ac.
   2. N or P marginal means = 28.6 lb./ac.
   3. N or P means at the same level of D, S or R = 49.5 lb./ac.
   4. D, S or R marginal means at the same level of N or P = 45.0 lb./ac.
   S.E. of body of D×S, D×R or R×S tables = 34.7 lb./ac.
   S.E. of body of N×P tables = 28.6 lb./ac.

   Crop :- Paddy (Kharif).
   Ref :- Gj. 59(129).
   Type :- 'CM'.

   Object :- To study the effect of spacing, seed rate and date of sowing along with N and P2O5 on Paddy crop.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Vegetables. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) As per treatments. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) —. (v) 15 C.L./ac. of F.Y.M. (vi) S-29. (vii) Irrigated. (viii) N.A. (ix) and (x) N.A.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1), (2) and (3)
(1) 3 dates of sowing: \( D_1 = 5.6.1959 \), \( D_2 = 15.6.1959 \) and \( D_3 = 25.6.1959 \).
(2) and (3) same as in Expt. no. 58(113) on page 30.
Sub-plot treatments:
Same as in Expt. no. 58(113) on page 30.

3. DESIGN:
(i) 3\( ^2 \)×4 confounded in split-plot. (ii) (a) 3 blocks/replication, 9 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 22'×15'. (b) 18'×12'. (v) 2'×1.5'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1401 lb./ac. (ii) a) 448.7 lb./ac. (b) 270.6 lb./ac. (iii) Main effect of N is highly significant. Interactions D×N and D×P are significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

<table>
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<td>1438</td>
<td>1401</td>
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</tbody>
</table>

S.E. of difference of two
1. D, S or R marginal means = 105.8 lb./ac.
2. N or P marginal means = 52.1 lb./ac.
3. N or P means at the same level of D, S or R = 90.2 lb./ac.
4. D, S or R means at the same level of N or P = 123.5 lb./ac.
S.E. of body of D×S, D×R or R×S tables = 129.5 lb./ac.
S.E. of body of N×P table = 52.1 lb./ac.

Crop :- Paddy (Kharif).
Object :- To compare different methods of Paddy cultivation.

Ref :- Gj. 59 (109).
Type :- 'CM'.
2. TREATMENTS:

4 methods of cultivation: C₁=Chinese with 6'x6' spacing, C₂=Departmental with 18' spacing, C₃=Japanese with 9'x9' spacing and C₄=Local with 9' spacing.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) 72'x72'. (iii) 6. (iv) (a) 35'x35'. (b) 30'x30'. (v) 3'x3'. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Blast disease. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
<th>C₄</th>
</tr>
</thead>
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<tr>
<td>Av. yield</td>
<td>889</td>
<td>1012</td>
<td>851</td>
<td>831</td>
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</tbody>
</table>

S.E./mean = 92.26 lb./ac.

Object — To assess the relative merits of Japanese, departmental and local methods of Paddy cultivation.

1. BASAL CONDITIONS:

(i) (a) Paddy—Wheat. (b) Wheat. (c) Nil. (ii) (a) Medium black soil. (b) Refer soil analysis, Navagam. (iii) 30.6.1954/27.7.1954. (iv) (a) Two ploughings in dry condition and puddling. (b) to (e) N.A. (vi) Sukhevel 20 (early). (vii) Irrigated. (viii) One hand weeding. (ix) 35'. (x) 20.10.1954.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Nursery</th>
<th>Field</th>
<th>Spacing</th>
<th>Seedlings/hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Japanese method</td>
<td>Raised seed bed, manuring by 1 C.L./guntha of F.Y.M.+16 lb./guntha of A/S+16 lb./guntha of Super.</td>
<td>5 C.L./ac. of F.Y.M. + G.M.+100 lb./ac. of N as A/S+80 lb./ac. of P₂O₅ as Super. (Top dressing in 3 doses)</td>
<td>9'x9'</td>
<td>1</td>
</tr>
<tr>
<td>2. Departmental method</td>
<td>Flat seed bed, manuring by 1 C.L./guntha of F.Y.M.+8 lb./guntha of A/S.</td>
<td>5 C.L./ac. of F.Y.M. + G.M.+64 lb./ac. of N as A/S+32 lb./ac. of P₂O₅ as Super. (Top dressing in 3 doses)</td>
<td>10'x10'</td>
<td>1</td>
</tr>
<tr>
<td>3. Local method</td>
<td>Flat seed bed, manuring with 1 C.L./guntha of F.Y.M.</td>
<td>10 C.L./ac. of F.Y.M. + 37 lb./ac. of N as A/S + 22 lb./ac. of G.M. (applied in one dose)</td>
<td>Irregular</td>
<td>1</td>
</tr>
</tbody>
</table>

3. DESIGN:

(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 22'-6"x22'-6". (b) 15'x15'. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Mild attack of paddy jassids and paddy stem-borers. (iii) Grain yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) The 3rd dose of manure could not be given as it rained continuously up to the middle of September, 1954. After that it was too late to apply manures.

5. RESULTS:

(i) 3278 lb./ac. (ii) 294.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
Crop: Paddy.  

Object: To compare the Japanese and the departmental methods of Paddy cultivation.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Wheat.  (b) Wheat.  (c) Nil.  (ii) (a) Medium black soil.  (b) Refer soil analysis, Navagam.  
   (iii) 30.6.1954/27.7.1954.  (iv) (a) to (2) N.A.  (v) 1 C.L./ac. of F.Y.M. for seed-bed and 5 C.L./ac. of F.Y.M.
   in the field.  (vi) Jirasal 274 (late).  (vii) Irrigated.  (viii) One hand weeding and 3 interculturings.  (ix) 35.43
   (x) 14.11.1954.

2. TREATMENTS:
   All combinations of the following 5 factors each at two levels.

   **Japanese**
   
   A1 = Raised seed bed  
   B1 = 1 C.L./ac. of F.Y.M.+16 lb./guntha of A/S  
   C1 = Spacing between bunches: 9'×9'.  
   D1 = 5 C.L./ac. of F.Y.M.+G.M.+100 lb./ac. of N as A/S+80 lb./ac. of P2O5 as Super.  
   E1 = One hand weeding+3 interculturings.

   **Departmental**
   
   A0 = Flat seed bed  
   B0 = Manuring of seed bed: 1 C.L./ac. of F.Y.M.+8 lb./guntha of A/S.  
   C0 = Spacing between bunches: 10'×10'.  
   D0 = Manuring of field: 5 C.L./ac. of F.Y.M.+G.M.+64 lb./ac. of N as A/S+32 lb./ac. of P2O5 as Super.  
   E0 = One hand weeding.

3. DESIGN:
   (i) 2^5 with BCDE, ABC and ADE effects confounded.  (ii) (a) 32.  (b) N.A.  
   (iii) 2.  (iv) (a) For 9'×9' spacing: 10'×6'×33', for 10'×10' spacing: 10'×10'×33'×4'.  (v) 7'×6×30' for both spacings.  
   (vi) Yes.

4. GENERAL:
   (i) Heavy lodging in 2nd week of December, 1954.  (ii) Nil; gamma xane dusted as precautionary measure. 
   (iii) Straw yield.  (iv) (a) 1953—1955.  (b) No.  (c) Nil.  
   (v) (a) Vyara.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 2949 lb./ac.  (ii) 524.0 lb./ac.  (iii) Effect of C is highly significant. Interactions AB and AD are significant. Other effects are not significant.  
   (iv) Mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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<td>-11</td>
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</table>

S.E. of mean response = 131.0 lb./ac.
S.E. of differential response = 185.2 lb./ac.

Crop: Paddy (Kharif).  

Object: To ascertain the optimum time of sowing, spacing, seed rate and N and P doses for Paddy.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) As per treatments. (iv) (a) One ploughing and one harrowing. (b) Drilling. (c) and (d) As per treatments. (e) --. (v) Nil. (vi) S-29. (vii) Irrigated. (viii) Three weedings. (ix) N.A. (x) 19.10.1958.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1), (2) and (3)
   (2) and (3) same as in exp. no. 58 (113) on page 30.

   Sub-plot treatments:
   Same as in Expt. no. 58 (113) on page 30.
   N and P applied in furrows on 1.9.1958.

3. DESIGN:
   (i) 3⁴ x 2² split-plot. (ii) (a) 27 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) One. (iv) (a) 18' x 24'. (b) 12' x 18'. (v) 3'all round the net plot. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (not conducted in 1959). (b) No. (c) Nil. (v) (a) Chikhali. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1315 lb./ac. (ii) (a) 457.2 lb./ac. (b) 279.1 lb./ac. (iii) Effects of N, D and D x R are highly significant. Interactions D x N, D x R and R x S are significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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S.E. of difference of two
1. D. S or R marginal means = 107.8 lb./ac.
2. N or P marginal means = 53.7 lb./ac.
3. N or P means at the same level of D. S or R = 93.0 lb./ac.
4. D, S or R means at the same level of N or P = 126.3 lb./ac.
S.E. of body of D x S, D x R or R x S tables = 132.0 lb./ac.
S.E. of body of N x P table = 53.7 lb./ac.

Crop :- Paddy.
Site :- Agri. Res. Stn., Vyara.
Object :- To compare the Japanese and departmental methods of Paddy cultivation.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) 20 lb./ac. of N as A/S and G.N.C. (ii) (a) Black soil. (b) N.A. (iii) 11.6.1954/7.7.1954. (iv) (a) N.A. (b) As per treatments. (c) (d) and (e) As per treatments. (v) N.A. (vi) Z-31 (early). (vii) Unirrigated. (viii) Two weedings and 3 interculturings. (ix) 81.14°. (x) 29.10.1954.

2. TREATMENTS:
Departmental
A<sub>d</sub>=Flat seed bed
B<sub>d</sub>=Manuring of seed bed: 1 C.L. of F.Y.M.+ 8 lb./guntha of A/S
C<sub>d</sub>=Manuring of field: 5 C.L. of F.Y.M.+ G.M.+64 lb./ac. of N as A/S+32 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super

Japanese
A<sub>j</sub>=Raised seed bed
B<sub>j</sub>=1 C.L. of F.Y.M.+16 lb./guntha of A/S+100 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super+layer of ash.
C<sub>j</sub>=5 C.L./ac. of F.Y.M.+G.M.+100 lb./ac. of N as A/S+80 lb./ac. of P<sub>2</sub>O<sub>5</sub>

3. DESIGN:
(i) 2<sup>6</sup> confounded factorial. (ii) (a) 64. (b) N.A. (iii) 1. (iv) (a) For 9"×9" spacing: 10'-6"×33'-6" and for 10"×10" spacing: 10'-10"×33'-4". (b) 7.5'×30' for all spacings. (v) 4 rows all round the net plot. (vi) Yes.

4. GENERAL:
(i) Normal. Lodging due to heavy rains. (ii) Mild attack of jassid hoppers. (iii) Fodder and grain yield. (iv) (a) 1953-1954. (b) No. (c) Nil. (v) (a) Navagam. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2353 lb./ac. (ii) 249.6 lb./ac. (iii) Main effect of D and interactions AC and CE are highly significant. Other effects are not significant. (iv) Mean and differential response in lb./ac.

### Differential response

<table>
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<th>Mean response</th>
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<th>C</th>
<th>D</th>
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S.E. of mean response =64.12 lb./ac.
S.E. of differential response =62.39 lb./ac.

---

Crop :- Paddy.
Site :- Agri. Res. Stn., Vyara.
Object :- To compare the Japanese and departmental methods of Paddy cultivation with the local method.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) 50 lb./ac. of A/S and 20 lb./ac. of N as G.N.C. (ii) (a) Black soil. (b) N.A. (iii) 10.6.1954/11.7.1954. (iv) (a) and (b) N.A. (c) 15 lb./ac. (d) and (e) N.A. (v) N.A. (vi) Z-31. (vii) No. (viii) One weeding. (ix) 81°. (x) 29.10.1954.

2. TREATMENTS
Three methods of raising seedlings: S<sub>1</sub>=Japanese, S<sub>2</sub>=departmental and S<sub>3</sub>=local. S<sub>1</sub> plots received 100 lb./ac. of P<sub>2</sub>O<sub>5</sub> and 100 lb./ac. of N, S<sub>2</sub> plots received 32 lb./ac. of P<sub>2</sub>O<sub>5</sub> and 64 lb./ac. of N and S<sub>3</sub> plots received 40 lb./ac. of N alone. N applied as A/S and P<sub>2</sub>O<sub>5</sub> as Super.
3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) For 9" x 9" spacing: 14'-3" x 33', for 10" x 10" spacing 15'-10" x 30' and for 9" x 9" spacing: 14'-3" x 33'. (b) 11'-3" x 30', 11'-6" x 30 and 11'-3" x 30'. (v) 4 rows round each net plot. (vi) Yes.

4. GENERAL:
(i) Lodging in S₁ and S₂ plots. (ii) Mild attack of jassid hoppers at an early stage. (iii) Fodder and grain yield. (iv) (a) No. (b) →. (c) Nil. (v) (a) Navagam. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 2672 lb./ac. (ii) 481.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2742</td>
<td>3087</td>
<td>2188</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean=170.3 lb./ac.

Object:—To compare the Japanese, departmental and local methods of Paddy cultivation.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) G.M.+5 C.L. of F.Y.M.+30 lb./ac. of N. (ii) (a) Black soil. (b) N.A. (iii) 21, 24.6.1955/29.7.1955. (iv) (a) N.A. (b) As per treatments. (c) →. (d) and (e) As per treatments. (v) Nil. (vi) Z-31. (vii) Irrigated. (viii) As per treatments. (ix) 77.97". (x) 9.11.1955.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Method</th>
<th>Seed bed</th>
<th>Spacing</th>
<th>Seed rate</th>
<th>Seedlings/bunch</th>
<th>Intercultures</th>
<th>Weeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Japanese (1)</td>
<td>Raised</td>
<td>10&quot; x 10&quot;</td>
<td>15 lb./ac.</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. Departmental</td>
<td>Flat</td>
<td>9&quot; x 9&quot;</td>
<td>30 lb./ac.</td>
<td>8</td>
<td>Nil</td>
<td>1</td>
</tr>
<tr>
<td>3. Local</td>
<td>Flat</td>
<td>6&quot; x 6&quot;</td>
<td>40 lb./ac.</td>
<td>6—8</td>
<td>Nil</td>
<td>2</td>
</tr>
<tr>
<td>4. Japanese (2)</td>
<td>Raised</td>
<td>10&quot; x 10&quot;</td>
<td>15 lb./ac.</td>
<td>4</td>
<td>Nil</td>
<td>2</td>
</tr>
</tbody>
</table>

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 15" x 35". (b) 7.5" x 30". (v) 3.75" x 2.50" all round the net plot. (vi) Yes.

4. GENERAL:
(i) Heavy lodging due to heavy rains at harvest time. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1954—1955 (modified in 1955). (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 206.2 lb./ac. (ii) 206.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1879</td>
<td>2223</td>
<td>1692</td>
<td>1903</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean=153.1 lb./ac.

Object:—To compare the Japanese, local and departmental methods of Paddy cultivation.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Light reddish soil. (b) N.A. (iii) 25.6.1955/29.7.1955. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) As per treatments. (v) Nil. (vi) Kada—66-I. (vii) Unirrigated. (viii) As per treatments. (ix) 86°. (x) 13.10.1955.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Method</th>
<th>Seed bed</th>
<th>Manuring to field</th>
<th>Spacing</th>
<th>Seedrate in seed bed</th>
<th>Cultural operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Local</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>5 lb./guntha</td>
<td>—</td>
</tr>
<tr>
<td>2. Departmental</td>
<td>Flat seed bed</td>
<td>5 C.L. of F.Y.M. 10°×10°</td>
<td>15 lb./guntha one hand weeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 C.L. of F.Y.M. +G.M.×64 lb. +8 lb. of A/S per guntha.</td>
<td>P_{2}O_{5} as Super.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Japanese I</td>
<td>Raised seed bed</td>
<td>5 C.L. of F.Y.M. 9°+9°</td>
<td>15 lb./guntha One hand weeding and three interculturings</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 C.L./ac. of F.Y.M.+16 lb. Super + 16 lb. A/S per guntha.</td>
<td>P_{2}O_{5} as Super</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Japanese II</td>
<td>Raised seed bed</td>
<td>5 C.L. of F.Y.M. 9°+0°</td>
<td>15 lb./guntha one hand weeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 C.L./ac. of F.Y.M.+16 lb. Super + 16 lb. A/S per guntha.</td>
<td>P_{2}O_{5} as Super</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) For 9°×9° spacing : 10°×33'. (b) 7°×30°. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1956 (modified in 1955). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1576 lb./ac. (ii) 236.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1270</td>
<td>1527</td>
<td>1751</td>
<td>1756</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=96.5 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

_Crop :- Paddy (Kharif)._  
_Site :- Agri. Res. Stn., Waghai._  
_Type :- 'CM'.

Ref :- Gj. 56(79).

Object :-To compare the Japanese, local and departmental methods of Paddy cultivation.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Nagli. (c) Nil. (ii) (a) Light with reddish colour. (b) N.A. (iii) 26.6.1956/21.7.1956. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) As per treatments. (v) Nil. (vi) Kada—66-I. (vii) Unirrigated. (viii) As per treatments. (ix) 108.69°. (x) 13.10.1955.

2. TREATMENTS:
Same as in expt. no. 55.65 above.

3. DESIGN:
(i) R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) For 9°×9° spacing : 10°×33'. (b) 7°×30°. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 1908 lb./ac.  (ii) 554.0 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1557</td>
<td>1940</td>
<td>2029</td>
<td>2105</td>
</tr>
</tbody>
</table>

S.E./mean = 224.6 lb./ac.

Crop :- Wheat.

Object :-To study the suitability of calcium cyanamide as a source of N in place of A/S and its effects on Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Bajra-Groundnut-Wheat-Cotton.  (b) Groundnut.  (c) 5 C.L./ac. of F.Y.M.  (ii) (a) Medium black.  (b) Refer soil analysis, Amreli.  (iii) 27.11.54.  (iv) (a) 2 harrowings.  (b) By drill.  (c) 60 lb./ac.  (d) 9" apart.  (e) N.A. (v) 5 C.L./ac. of F.Y.M. in October.  (vi) Kenphad (R.R.) medium.  (vii) Irrigated.  (viii) 1 weeding.  (ix) Nil.  (x) 26.3.1955.

2. TREATMENTS:
4 sources of 40 lb./ac. of N : S1=A/S alone, S2=A/S and G.N.C. in 1 : 1 ratio, S3=Ca CN alone and S4=Ca CN and G.N.C. in 1 : 1 ratio.
All fertilizers applied at the time of sowing.

3. DESIGN:
(i) R.B.D.  (ii) 4.  (b) N.A.  (iii) 6.  (iv) (a) 35' x 13'.  (b) 30' x 9'.  (v) One row the net plot.  (vi) Yes.

4. GENERAL:
(i) Good.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1953—contd.  (b) N.A.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1216 lb./ac.  (ii) 119.9 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1191</td>
<td>1218</td>
<td>1227</td>
<td>1227</td>
</tr>
</tbody>
</table>

S.E./mean = 48.94 lb./ac.
4. GENERAL:
(i) The germination and the initial growth was quite good. (ii) The disease of foot-rot was observed at few places showing white patches of dry immature plants. (iii) Grain yield. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi; and (vii) Nil.

5. RESULTS:
(i) 1907 lb./ac. (ii) 153.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1924</td>
<td>1922</td>
<td>1918</td>
<td>1864</td>
<td></td>
<td>62.50 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Site :- Agri. College Farm, Anand.  
Ref :- Gj. 56(91).  
Type :- 'M'.
Object :- To study the effect of different nitrogenous fertilizers on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Black soil. (b) Refer soil analysis, Anand. (iii) 13.11.1956. (iv) (a) N.A. (b) Drilling. (c) 100 lb./ac. (d) 12''. (e) N.A. (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P₂O₅. (vi) Kenphad. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
5 sources of 40 lb./ac. of N : S₀ = Control, S₁ = A/S, S₂ = Urea, S₃ = C/N, S₄ = CaCN and S₅ = AJSJN.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 21'×30'. (b) 15'×30'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1956—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi and (vii) Nil.

5. RESULTS:
(i) 1415 lb./ac. (ii) 217.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1180</td>
<td>1484</td>
<td>1499</td>
<td>1611</td>
<td>1173</td>
<td>1544</td>
<td>108.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Site :- Agri. College Farm, Anand.  
Ref :- Gj. 58(87).  
Type :- 'M'.
Object :- To study the effect of different nitrogenous fertilizers on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Black Cotton. (b) Refer soil analysis, Anand. (iii) N.A. (iv) (a) N.A. (b) Drilling. (c) 100 lb./ac. (d) 12''. (e) N.A. (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P₂O₅. (vi) Kenphad. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
Same as in exp. no. 56(91) above.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 21'×27'. (b) 15'×21'. (v) 3' around the net plot. (vi) Yes.
4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1952—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1109 lb/ac. (ii) 82.90 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1063</td>
<td>1139</td>
<td>1155</td>
<td>1139</td>
<td>1044</td>
<td>1115</td>
</tr>
</tbody>
</table>

S.E./mean = 41.45 lb/ac.

---

Crop :- Wheat.

Object :- To see the effect of application of F.Y.M. at different intervals on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Medium deep black. (b) Refer soil analysis, Arnej. (iii) 25.10.1954. (iv) (a) Four harrowings prior to sowing. (b) Drilled. (c) 40 lb/ac. (d) 12". (e) N.A. (v) As per treatments. (vi) A.-206. (medium). (vii) Unirrigated. (viii) Weeding. (ix) 24.10". (x) 10.3.1955.

2. TREATMENTS:
   A=Control.
   B=5 C.L/ac. of F.Y.M. every year starting from 1952.
   C=5 C.L/ac. of F.Y.M. every alternate year starting from 1952.
   D=5 C.L/ac. of F.Y.M. every alternate year starting from 1953.
   E=5 C.L/ac. of F.Y.M. every third year starting from 1952.
   F=5 C.L/ac. of F.Y.M. every third year starting from 1953.
   G=5 C.L/ac. of F.Y.M. every third year starting from 1954.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 36’×16’. (b) 30’×10’. (v) N.A. (vi) No.

4. GENERAL:
   (i) Good. (ii) and (iii) Nil. (iv) (a) 1952—58. (b) Yes. (c) Nil. (v) (a) No. (b) Nil. (vi) Cloudy weather at milk stage and excess of moisture affected the grain colour heavily. (vii) Nil.

5. RESULTS:
   (i) 880.6 lb/ac. (ii) 132.9 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>813.1</td>
<td>918.9</td>
<td>871.2</td>
<td>869.5</td>
<td>856.7</td>
<td>971.6</td>
<td>863.2</td>
</tr>
</tbody>
</table>

S.E./Mean = 54.25 lb/ac.

---

Crop :- Wheat (Rabi).

Object :- To see the effect of application of F.Y.M. at different intervals on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat after wheat. (b) Wheat. (c) As per treatments. (ii) (a) Medium black. (b) Refer soil analysis, Arnej. (iii) 27.10.1955. (iv) (a) N.A. (b) Drilling. (c) 40 lb/ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Arnej-206. (vii) Unirrigated. (viii) Nil. (ix) 26.0". (x) 25.26.2.1956.
TREATMENTS:
Same as in expt. no. 54(7) on page 41.

DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 36' x 16'. (b) 33' x 10'. (v) 3' all round the net plot. (vi) Yes.

GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—58. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Nil.

RESULTS:
(i) 794 lb./ac. (ii) 103.8 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>891</td>
<td>756</td>
<td>802</td>
<td>716</td>
<td>721</td>
<td>859</td>
<td>814</td>
</tr>
<tr>
<td>S.E./Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat.
Ref :- Gj. 56(4).
Type :- 'M'.

Object :- To see the effect of application of F.Y.M. at different intervals on the yield of Wheat.

BASAL CONDITIONS:

TREATMENTS:
Same as in expt. no. 54(7) on page 41.

DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) 36' x 16'. (b) 30' x 10'. (v) 3' x 3'. (vi) No.

GENERAL:
(i) Normal. (ii) and (iii) Nil. (iv) (a) 1952—1957. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

RESULTS:
(i) 558.2 lb./ac. (ii) 126.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>592.4</td>
<td>579.6</td>
<td>554.9</td>
<td>492.2</td>
<td>530.9</td>
<td>614.9</td>
<td>542.8</td>
</tr>
<tr>
<td>S.E./Mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat.
Ref :- Gj. 57(2).
Type :- 'M'.

Object :- To see the effect of application of F.Y.M. at different intervals on the yield of Wheat.

BASAL CONDITIONS:
(i) (a) Wheat—Wheat. (b) Wheat. (c) As per treatments. (ii) (a) Medium black. (b) Refer soil analysis, Arnej; (iii) 14.10.1957. (iv) (a) Six harrowings. (b) to (e) N.A. (v) Nil. (vi) A—206 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 13'. (x) 18.2.1958.
2. TREATMENTS:
   Same as in exp. no. 54(7) on page 41.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) N.A.  (iii) 6.  (iv) (a) 36'x16'.  (b) 30'x10'.  (v) 3' all round the net/plot.  
   (vi) No.

4. GENERAL:
   (i) Poor.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1952—1958.  (b) Yes.  (c) N.A.  (v) (a) and (b) N.A.  
   (vi) Crop failed due to scanty rains.  (vii) Nil.

5. RESULTS:
   (ii) 456.1 lb/ac.  (ii) 126.6 lb/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>458.8</td>
<td>486.2</td>
<td>472.4</td>
<td>440.7</td>
<td>428.6</td>
<td>443.8</td>
<td>462.0</td>
</tr>
</tbody>
</table>

S.E./mean = 51.68 lb/ac.

Crop :- Wheat.  
Ref :- Gj. 58(2).  
Type :- 'M'.

Object :-To see the effect of application of FYM at different intervals on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Wheat.  (b) Wheat.  (c) As per treatment.  (ii) (a) Medium black.  (b) Refer soil analysis, 
   Arnej.  (iii) 6.11.1958.  (iv) (a) N.A.  (b) Drilling.  (c) 40 lb/ac.  (d) 12' between rows.  (e) N.A.  (v) 

2. TREATMENTS:
   Same as in exp. no. 54(7) on page 41.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) 24192 Sq. ft.  (iii) 6.  (iv) (a) 36'x16'.  (b) 30'x10'.  (v) 3'x3'.  
   (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1952—1958.  (b) Yes.  (c) Nil.  (v) (a) and (b) N.A.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 813 lb/ac.  (ii) 76.23 lb/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<tr>
<td>Av. yield</td>
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<td>850</td>
<td>817</td>
<td>784</td>
<td>751</td>
<td>853</td>
<td>824</td>
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</table>

S.E./mean = 31.12 lb/ac.

Crop :- Wheat.  
Ref :- Gj. 59(46).  
Type :- 'M'.

Object :-To see the effect of N and P on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Gram.  (b) Gram.  (c) Nil.  (ii) (a) Medium black.  (b) Refer soil analysis, Arnej.  (iii) 
   8.11.1959.  (iv) (a) Four harrowings.  (b) Drilling.  (c) 40 lb/ac.  (d) 12'.  (e) —.  (v) Nil.  (vi) Arnej— 
2. TREATMENTS:
All combinations of (1) and (2)+1 extra treatment T1
(1) 4 levels of N as A/S: N1=0, N2=10 lb./ac., N3=20 lb./ac. and N4=30 lb./ac. of N.
(2) 2 levels of P2O5 as Super: P0=0 and P1=20 lb./ac. of P2O5.
T1=10 lb./ac. of N as A/S+10 lb./ac. of N as G.N.C.+20 lb./ac. of P2O5 as Super.

3. DESIGN:
(i) Fact. in R.B.D. (vi) Yes.
(ii) 9. (a) N.A. (b) No. (c) Nil. (d) 36' x 21'. (e) 30' x 15'. (v) 3' all round the net plot.
(iii) 4. (b) 30' x 15'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A.
(vi) and (vii) Nil.

5. RESULTS:
(i) 593 lb./ac. (ii) 85.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain
in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
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<tr>
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<td>380</td>
<td>528</td>
<td>631</td>
<td>740</td>
<td>570</td>
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<tr>
<td>P1</td>
<td>383</td>
<td>629</td>
<td>663</td>
<td>725</td>
<td>600</td>
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</table>

S.E. of N marginal means = 30.74 lb./ac.
S.E. of P marginal means = 21.73 lb./ac.
S.E. of body of table = 43.47 lb./ac.

Crop :- Wheat.
Object :- To study the effect of micro-nutrients on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Wheat—Gram. (b) Gram. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Arnej. (iii) 9.11.1956.
(iv) (a) Five harrowings. (b) Drilling. (c) to (e) N.A. (v) (i) 20 lb./ac. of P2O5. (ii) 20 lb./ac. of N as A/S. (vi) A-206 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 39' x 10'. (x) 12.3.1957.

2. TREATMENTS:
All combinations of (1), (2), (3), (4) and (5)
1. 2 levels of Zinc (Zn) as ZnSO4: A0=0 and A1=ZnSO4 at 9 lb.+Lime at 2 lb.+100 gallons of water.
2. 2 levels of Manganese (Mn) as MnSO4: B0=0 and B1=MnSO4 at 3 lb.+Lime at 2 lb.+100 gallons of water.
3. 2 levels of Copper (Cu) as CuSO4: C0=0 and C1=CuSO4 at 8 lb.+Lime at 8 lb.+100 gallons of water.
4. 2 levels of Molybdenum (Mo) as Sodium Molybdate+CaCO3: D0=0 and D1=Sodium Molybdate
   at 3 oz.+100 gallons of water.
5. 2 levels of Boron (B) as Borax: E0=0, and E1=Borax at 2 lb.+Bentonite at 0.5 lb.+100 gallons of water.

Total quantity of foliar spray is 140 gallons/acre. All sprays contain 3½ pints of Tenac (Burrah Shell) per
100 gallons as spreader and sticker.

3. DESIGN:
(i) 25 Fact. in R.B.D. (ii) 32. (b) N.A. (iii) 4. (iv) 17' x 15'. (b) 12' x 10'. (v) 2.5' around the net plot. (vi) Yes.

Ref :- Gj. 56(5).
Type :- ‘M’.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 824.2 lb./ac. (ii) 155.1 lb./ac. (iii) Main effects and interactions are not significant. (iv) Mean and differential responses in lb./ac.

### Differential response

<table>
<thead>
<tr>
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<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
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<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
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<tr>
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<td>-32.89</td>
<td>-42.65</td>
<td>-53.99</td>
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</tbody>
</table>

S.E. of mean response = 27.42 lb./ac.
S.E. of differential response = 38.77 lb./ac.

**Crop:** Wheat (Rabi).

**Site:** Agri. Res. Stn., Arnej.

**Object:** To study the effect of micro-nutrients on the yield of Wheat.

1. **BASEL CONDITIONS:**
   (i) (a) Wheat—Gram. (b) Gram. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Arnej.
   (iii) 18.10.1957. (iv) (a) Eight harrowings. (b) to (e) N.A. (v) (a) 20 lb./ac. of P2O5 on 10.10.1957 by drilling. (ii) 20 lb./ac. of N as A/S drilled on 14.10.1957. (vi) A-20 (medium). (vii) Unirrigated. (viii) One weeding. (ix) 18". (x) 22.2.1958.

2. **TREATMENTS:**
   Same as in Expt. no. 56(5) on page 44.

3. **DESIGN:**
   (i) 2^5 Factor in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 17' x 15'. (b) 12' x 10'. (v) 2.5' around the net plot. (vi) Yes.

4. **GENERAL:**
   (i) Poor due to scanty rain fall. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 364.3 lb./ac. (ii) 118.6 lb./ac. (iii) Main effects and interactions are not significant. (iv) Mean and differential responses in lb./ac.

### Differential response

<table>
<thead>
<tr>
<th></th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean response</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
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<td>32.84</td>
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<td>52.07</td>
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<td>Mn</td>
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<td>-</td>
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<td>16.79</td>
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<tr>
<td>Mo</td>
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<td>-</td>
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<td>-19.17</td>
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<td>B</td>
<td>20.59</td>
<td>31.99</td>
<td>7.26</td>
<td>33.92</td>
<td>26.88</td>
</tr>
</tbody>
</table>

S.E. of mean response = 20.97 lb./ac.
S.E. of differential response = 29.65 lb./ac.
Crop :- Wheat.  
Site :- Agri. Res. Stn., Dabhoi. 
Object :-To study the effect of N on the yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil.  (b) Wheat.  (c) Sann G.M.  
   (ii) (a) Nil.  (b) Refer soil analysis, Dabhoi.  
   (iii) 22.12.1959.  
   (iv) (a) 2 ploughings and one harrowing.  (b) Drilling.  
   (c) 60 lb./ac.  (d) 12' between rows.  (e) —.  
   (v) Nil.  (vi) NP-710.  (vii) Irrigated.  

2. TREATMENTS :
   4 levels of N as A/S: Na=0, N1=20, N3=40 and N3=60 lb./ac.  

3. DESIGN :
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  
   (iii) 4.  (iv) (a) 34'×16'.  (b) 30'×14'.  (v) 2'×1'.  
   (vi) Yes.

4. GENERAL :
   (i) Normal.  
   (ii) Nil.  
   (iii) Grain yield.  (iv) (a) 1957-59.  (b) N.A.  
   (c) Nil.  (v) (a) and (b) N.A.  
   (vi) and (vii) Nil.

5. RESULTS :
   (i) 770 lb./ac.  (ii) 127 lb./ac.  (iii) Treatment differences are highly significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N0</th>
<th>N1</th>
<th>N3</th>
<th>N6</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>504</td>
<td>824</td>
<td>915</td>
<td>836</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>63.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Site :- Agri. Res. Stn., Dohad. 
Object :-To study the effect of different micro-nutrients on Wheat.

1. BASAL CONDITIONS :
   (i) (a) Groundnut and Maize in Kharif—Wheat in Rabi.  (b) Gram.  
   (c) N.A.  (ii) Light brown (gorada)  
   (b) Refer soil analysis, Dohad.  
   (iv) (a) 2 ploughings.  (b) Drilling.  
   (c) 40 lb./ac.  (d) 15'.  (e) —.  
   (v) 5 C.L./ac. of F.Y.M.  
   (vi) R.R. (medium).  
   (vii) Irrigated.  
   (viii) N.A.  
   (ix) 23.26'.  (x) 2 and 3.4.1958.

2. TREATMENTS :
   Same as in Expt. no. 55(5) on page 44.

3. DESIGN :
   (i) 2^2 Fact. in R.B.D.  
   (ii) (a) 32.  (b) N.A.  
   (iii) 4.  (iv) (a) 17'×15'.  (b) 12'×10'.  
   (v) 2.5' all round the net plot.  
   (vi) Yes.

4. GENERAL :
   (i) N.A.  
   (ii) Nil.  
   (iii) Grain yield.  
   (iv) (a) 1957—59.  
   (b) No.  
   (c) Nil.  
   (v) (a) and (b) N.A.  
   (vi) Nil.  
   (vii) Nil.

5. RESULTS :
   (i) 619 lb./ac.  
   (ii) 122.2 lb./ac.  
   (iii) Interaction Mo×B alone is significant.  
   (iv) Mean and differential responses in lb./ac.
Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
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<tbody>
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<td>-5.95</td>
<td>31.76</td>
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</table>

S.E. of mean response = 21.60 lb./ac.  S.E. of differential response = 30.54 lb./ac.

Site: Agri. Res. Stn., Dohad.  Type: 'M'.

Object: To study the effect of different micro-nutrients on Wheat.

1. BASAL CONDITIONS:
(i) (a) Groundnut and Maize in Kharif-Wheat in Rabi.  (b) Groundnut.  (c) Nil.  (ii) (a) Light brown (gorade).  (b) Refer soil analysis, Dohad.  (iii) 10.12.1958.  (iv) (a) 2 ploughings.  (b) Drilling.  (c) 40 lb./ac.  (d) 15" x 3" to 6".  (e) N.A.  (v) 20 lb./ac. of P₂O₅ as Super in furrows + 40 lb./ac. of N as A/S broadcast.  (vi) Kenphad-25 R.R. (medium).  (vii) Irrigated.  (viii) 2 weedings.  (ix) 46.62".  (x) 25 to 29.4.1959.

2. TREATMENTS:
Same as in Expt. no. 56(5) on page 44.

3. DESIGN:
(i) 2x Fact. in R.B.D.  (ii) (a) 32.  (b) N.A.  (iii) 4. (iv) (a) 17" x 15".  (b) 12" x 10".  (v) 2.5' all round the net plot.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1957-59.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1376 lb./ac.  (ii) 232.3 lb./ac.  (iii) None of the effects is significant.  (iv) Mean and differential responses in lb./ac.

Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
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<td>17.47</td>
<td>44.69</td>
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</tbody>
</table>

S.E. of mean response = 41.1 lb./ac.  S.E. of differential response = 58.1 lb./ac.
Object:—To study the effect of different micro-nutrients on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Groundnut and Maize in kharif—Wheat in Rabi. (b) Maize. (c) Super and A/S applied-amount N.A. (ii) (a) Light brown (gorada). (b) Refer soil analysis, Dohad. (iii) 17.11.1959. (iv) (a) 2 ploughings. (b) Drilling. (c) 43 lb./ac. (d) 15' × 3' to 6'. (e) N.A. (v) 5 C.L./ac. of F.Y.M.. (vi) Kenphad-25 (medium.) (vii) Irrigated. (viii) 2 weedings and 1 interculture. (ix) 35.62'. (x) 20 to 25.4.1960.

2. TREATMENTS:
   Same as in Expt. No. 56(5) on page 44.

3. DESIGN:
   (i) 25 Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 17' × 15'. (b) 12' × 10'. (v) 2.5' all round the net plot. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain yield and height of plant. (iv) (a) 1937-1938. (b) N.A. (c) Nil. (v) (a; and (b) N.A. (vi) Nil. and (vii) Nil.

5. RESULTS:
   (i) 1478 lb/ac. (ii) 282.8 lb/ac. (iii) Interaction Zn × Mn alone is significant. (iv). Mean and differential responses in lb/ac.

Differential response

<table>
<thead>
<tr>
<th></th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
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</tr>
<tr>
<td>S.E. of mean response</td>
<td>50.0 lb/ac.</td>
<td>70.7 lb/ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of differential response = 70.7 lb/ac.

Object:—To study the effect of application of Urea on growth and yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat. (b) Maize. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Light brown (gorada). (b) Refer soil analysis, Dohad. (iii) 11.12.1958. (iv) (a) Two ploughings. (b) Drilling. (c) 40 lb./ac. (d) N.A. (e) N.A. (v) Nil. (vi) Kenphad-25 (medium). (vii) Irrigated. (viii) 2 weedings and 2 intercultures. (ix) 46.62'. (x) 24.4.1959.

2. TREATMENTS:
   1. Control.
   2. 1% Urea at flag leaf stage.
   3. 1% Urea at flag leaf stage + 1% Urea at flowering.
   4. 3% Urea at flag leaf stage.
   5. 3% Urea at flag leaf stage + 3% Urea at flowering.
   6. 5% Urea at flag leaf stage.
   7. 5% Urea at flag leaf stage + 5% Urea at flowering.
5. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) N.A.  (iii) 4.  (iv) (a) $40' \times 12'$.  (b) $35' \times 8'$.  (v) $2.5' \times 2'$.  (vi) Yes.

4. GENERAL:
   (i) N.A.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1958-59.  (b) No.  (c) Nil.  (v) - (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 999 lb./ac.  (ii) 101.1 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>804</td>
<td>884</td>
<td>948</td>
<td>1007</td>
<td>1065</td>
<td>1045</td>
<td>1237</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>50.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Crop > Wheat (Rabi).
Site > Agri. Res. Stn., Dohad.>

Object:—To study the effect of application of Urea on growth and yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Maize—Wheat.  (b) Maize.  (c) 20 lb./ac. of N as A/S.  (ii) (a) Light brown (goradi).  (b) Refer soil analysis, Dohad.  (iii) 14.12.1959.  (iv) (a) 2 ploughings.  (b) Drilling.  (c) $40 lb./ac.$.  (d) 15".  (e) N.A.  (v) Nil.  (vi) Kenphad-25 (medium).  (vii) Irrigated.  (viii) 3 weedings.  (ix) 36.62".  (x) 15 to 17.4.1960.

2. TREATMENTS:
   Same as in expt. no. 58(15) on page 48.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) N.A.  (iii) 4.  (iv) (a) $42' \times 12'$.  (b) $38' \times 8'$.  (v) $2' \times 2'$.  (vi) Yes.

4. GENERAL:
   (i) N.A.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1958—1959.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1131 lb./ac.  (ii) 235.3 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1025</td>
<td>1043</td>
<td>1074</td>
<td>1101</td>
<td>1160</td>
<td>1141</td>
<td>1370</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>117.6 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Crop > Wheat (Rabi).
Site > Agri. Res. Stn., Dohad.>

Object:—To study the effect of different sources of N on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Maize.  (b) Maize.  (c) Nil.  (ii) (a) Light brown.  (b) Refer soil analysis, Dohad.  (iii) 29.11.1954.  (iv) (a) 1 harrowing and 1 ploughing.  (b) Drilling.  (c) to (e) N.A.  (v) Nil.  (vi) Pusa-4.  (vii) Irrigated.  (viii) N.A.  (ix) 46.23".  (x) 3 to 5.4.1955.
2. **TREATMENTS:**

4 sources of 40 lb./ac. of N:
- $S_0 =$ Control (no manure), $S_1 =$ A/S, $S_2 =$ A/S and G.N.C. in 1 : 1 ratio,
- $S_3 =$ Ca CN and $S_4 =$ Ca CN and G.N.C. in 1 : 1 ratio.

3. **DESIGN:**

(i) R.B.D. (ii) (a) 5. (b) N.A. (ii) 2. (iv) (a) 30'×63'. (b) 20'×53'. (v) 5'×5'. (vi) Yes.

4. **GENERAL:**

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**

(i) 1608 lb./ac. (ii) 93.49 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1359</td>
<td>1690</td>
<td>1781</td>
<td>1519</td>
<td>1693</td>
</tr>
</tbody>
</table>

S.E./mean = 66.12 lb./ac.

---

**Crop:** Wheat (Rabi).
**Site:** Agri. Res. Farm, Halvad.
**Ref:** Gj. 54(43).
**Type:** 'M'.

Object:—To study the effect N and P on growth and yield of Wheat.

1. **BASAL CONDITIONS:**

(i) (a) No. (b) Bajra. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 17.11.1959.

(iv) (a) Harrowing, cultivation by drill three times after soaking. (b) Drilling. (c) 80 lb./ac. (d) 9" between two lines. (e) N.A. (v) Nil. (vi) Wheat N.P. 710 (medium). (vii) Irrigated. (viii) Two intercultivations by kudali and one weeding. (ix) Nil. (x) 14.3.1955.

2. **TREATMENTS:**

All combinations of (1) and (2)

1) 3 levels of N as A/S: $N_0 =$ 0, $N_1 =$ 20 and $N_2 =$ 40 lb./ac.

2) 3 levels of $P_2O_5$ as Super: $P_0 =$ 0, $P_1 =$ 20 and $P_2 =$ 40 lb./ac.

3. **DESIGN:**

(i) Fact. in R.B.D. (ii) 'a'. 9. (b) N.A. (iii) 6. (iv) (a) 41'×13'. (b) 38'×10'. (v) Two lines on each side of plot lengthwise, 3' distance breadthwise. (vi) Yes.

4. **GENERAL:**

(i) Not good, except in the plot $N_2P_2$. (ii) Nil. (iii) Height of plant, length of earheads, no. of earheads/plant, and no. of grains/earhead. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. **RESULTS:**

(i) 458.8. (ii) 66.49 lb./ac. (iii) Main effect of N and P and interaction N×P are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>$N_0$</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_0$</td>
<td>173.7</td>
<td>279.1</td>
<td>289.3</td>
</tr>
<tr>
<td>$P_1$</td>
<td>303.0</td>
<td>514.3</td>
<td>676.1</td>
</tr>
<tr>
<td>$P_2$</td>
<td>389.9</td>
<td>601.2</td>
<td>902.7</td>
</tr>
</tbody>
</table>

Mean 288.9 464.9 622.7 458.8

S.E. of N or P marginal mean = 15.67 lb./ac.

S.E. of body of table = 27.14 lb./ac.

---


Object: To find out the optimum dose of N and P for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Groundnut. (c) 300 lb/ac. of P2O5. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 23.11.1955. (iv) (a) 1 ploughing. (b) Drilling. (c) 60 lb/ac. (d) 9". (e) —. (v) Nil. (vi) Kenphad. (vii) Irrigated. (viii) Nil. (ix) 13.75". (x) 27.3.1956.

2. TREATMENTS:
   Same as in Expt. no. 54(43) on page 50.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) 51'X13'. (b) 45'X6.75'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1076 lb/ac. (ii) 124.9 lb/ac. (iii) Main effects of N and P and interaction N×P are highly significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>288</td>
<td>752</td>
<td>883</td>
<td>641</td>
</tr>
<tr>
<td>P1</td>
<td>262</td>
<td>1571</td>
<td>1859</td>
<td>1231</td>
</tr>
<tr>
<td>P2</td>
<td>474</td>
<td>1474</td>
<td>2123</td>
<td>1357</td>
</tr>
<tr>
<td>Mean</td>
<td>341</td>
<td>1266</td>
<td>1622</td>
<td>1076</td>
</tr>
</tbody>
</table>

S.E. of N or P marginal means =32.25 lb/ac.
S.E. of body of table =55.86 lb/ac.

Crop :- Wheat. Ref :- Gj. 56(29).
Site :- Agri. Res. Farm, Halvad. Type :- 'M'.
52

<table>
<thead>
<tr>
<th></th>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_0 )</td>
<td>806</td>
<td>999</td>
<td>1140</td>
<td>982</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>736</td>
<td>1523</td>
<td>1564</td>
<td>1274</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>960</td>
<td>1377</td>
<td>1672</td>
<td>1336</td>
</tr>
<tr>
<td>Mean</td>
<td>834</td>
<td>1300</td>
<td>1459</td>
<td>1197</td>
</tr>
</tbody>
</table>

S.E. of N or P marginal means = 35.68 lb./ac.
S.E. of body of any table = 61.81 lb./ac.

Crop: Wheat.
Site: Agri. Res. Farm, Halvad.
Ref: Gj. 56(123).
Type: 'M'.

Object: To find out suitable doses of N, P and K for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Groundnut—wheat—cotton. (b) Tur in Kharif. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 19.11.1956. (iv) (a) One ploughing. (b) Drilling. (c) 60 lb./ac. (d) 9' between rows. (e) —. (v) Nil. (vi) N.P.-710. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 17.3.1957.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: \( N_1 =20, \ N_2 =40 \) and \( N_3 =60 \) lb./ac.
   (2) 3 levels of \( P_0 : P_1 =20, \ P_2 =40 \) and \( P_3 =60 \) lb./ac.
   (3) 3 levels of \( K_0 : K_1 =10, \ K_2 =20 \) and \( K_3 =40 \) lb./ac.

3. DESIGN:
   (i) 3³ Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) One. (iv) (a) 5¹×4.5'. (b) 45'×2.25'. (v) 3¹×1'. (vi) Yes.

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

5. RESULTS:
   (i) 1829 lb./ac. (ii) 104.1 lb./ac. (iii) Main effect of N is highly significant while that of P is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
<th>Mean</th>
<th>( K_1 )</th>
<th>( K_2 )</th>
<th>( K_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_1 )</td>
<td>1534</td>
<td>1729</td>
<td>1878</td>
<td>1714</td>
<td>1807</td>
<td>1620</td>
<td>1715</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>1672</td>
<td>1815</td>
<td>2180</td>
<td>1889</td>
<td>1815</td>
<td>1893</td>
<td>1959</td>
</tr>
<tr>
<td>( P_3 )</td>
<td>1649</td>
<td>1864</td>
<td>2135</td>
<td>1883</td>
<td>1878</td>
<td>1950</td>
<td>1821</td>
</tr>
<tr>
<td>Mean</td>
<td>1618</td>
<td>1803</td>
<td>2065</td>
<td>182</td>
<td>1833</td>
<td>1821</td>
<td>1832</td>
</tr>
</tbody>
</table>

S.E. of N, P or K marginal means = 34.7 lb./ac.
S.E. of body of any table = 60.1 lb./ac.
Crop :- Wheat (Rabi).
Object :- To find out suitable doses of N, P and K for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) 100 lb./ac. of manure mixture + 50 lb./ac. of A/S. (ii) (a) Medium black (b) Refer soil analysis, Halvad. (iii) 8.11.1957. (iv) (a) 2 ploughings and 2 harrowings. (b) to (e) N.A. (v) Nil. (vi) Kenphad. (vii) Irrigated. (viii) 3 weedings. (ix) Nil. (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 56(123) on page 52.

3. DESIGN:
   (i) 3 x 3 Factorial in R.B.D. (ii) (a) 27. (b) N.A. (iii) 3. (iv) (a) 360 sq. ft. (b) 153 sq. ft. (v) Two rows on each side. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) No. of plants, earheads and grain yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (d) and (e) N.A. (vii) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1215 lb./ac. (ii) 142.9 lb./ac. (iii) Main effects of N and P and interaction N×P are highly significant. Other effects and interactions are not 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>K1</th>
<th>K2</th>
<th>K3</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>871</td>
<td>1047</td>
<td>1272</td>
<td>1063</td>
<td>1077</td>
<td>1046</td>
<td>1066</td>
</tr>
<tr>
<td>P2</td>
<td>899</td>
<td>1270</td>
<td>1517</td>
<td>1229</td>
<td>1274</td>
<td>1183</td>
<td>1229</td>
</tr>
<tr>
<td>P3</td>
<td>989</td>
<td>1344</td>
<td>1722</td>
<td>1352</td>
<td>1424</td>
<td>1359</td>
<td>1272</td>
</tr>
<tr>
<td>Mean</td>
<td>920</td>
<td>1220</td>
<td>1504</td>
<td>1215</td>
<td>1259</td>
<td>1197</td>
<td>1189</td>
</tr>
<tr>
<td>K1</td>
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<td>1263</td>
<td>1539</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K2</td>
<td>903</td>
<td>1239</td>
<td>1448</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K3</td>
<td>883</td>
<td>1159</td>
<td>1525</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal means of N, P or K = 27.51 lb./ac.
S.E. of body of table = 47.64 lb./ac.

Crop :- Wheat.
Object :- To find out the proper time of application of A/S to Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black (b) Refer soil analysis, Halvad. (iii) 21.11.1954. (iv) (a) 2 harrowings. (b) Drilling. (c) 90 lb./ac. (d) 9". (e)— (f) Nil. (vi) N.P.-710. (vii) Irrigated (viii) 2 intercultures. (ix) Nil. (x) 16.3.1955.

2. TREATMENTS:
   300 lb./ac. of A/S applied. T1 = as a soaking dose; T2 = at the time of sowing and T3 = at the time of first irrigation.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) 41'×13'. (b) 38'×10'. (v) 1.5'×1.5'. (vi) Yes.
4. GENERAL
   (i) Very poor.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1954-N.A.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.
   (vi) Nil.  (vii) Yields very low. Reasons are not known.

5. RESULTS:
   (i) 174 lb./ac.  (ii) 40.65 lb./ac.  (iii) Treatments differ significantly.  (iv) Av. yield of grain in lb./ac.
   Treatment  T_1  T_2  T_3
   Av. yield  208  170  *  145
   S.E./mean = 14.37 lb./ac.

   Site :- Agri. Res. Stn., Halvad.  Type :- 'M'.

Object :- To find out the proper time of application of A/S to Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) Nil.  (ii) (a) Medium black.  (b) Refer soil analysis, Halvad.  (iii) 17.11.1955.  (iv) (a) 3
   ploughings.  (b) Drilling.  (c) 60 lb./ac.  (d) 9".  (e) --.  (v) 5 C.L. of F-Y.M./ac. on 16.10.1955.  (vi) N.P.-710.
   (vii) Irrigated.  (viii) Nil.  (ix) 13.75".  (x) 20.3.1956.

2. TREATMENTS:
   100 lb. ac. of A/S applied.  
   T_1 = as a soaking dose (13.11.1955); T_2 = at the time of sowing (16.11.1955); and T_3 = at the time

3. DESIGN:
   (i) R.B.D.  (ii) (a) 3.  (b) N.A.  (iii) 6.  (iv) (a) 31'x13.5'.  (b) 224 sq. ft.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1954—N.A.  (b) No.  (c) Nil.  (v) (a) and (b)
   N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1568 lb./ac.  (ii) 126.2 lb./ac.  (iii) Treatments do not differ significantly.  (iv) Av. yield of
   grain in lb./ac.
   Treatment  T_1  T_2  T_3
   Av. yield  1607  1460  1638
   S.E./mean = 51.52 lb./ac.

   Crop :- Wheat.  Ref :- Gj. 56(31).
   Site :- Agri. Res. Stn., Halvad.  Type :- 'M'.

Object :- To find out the proper time of application of A/S to Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Sann.  (c) 200 lb./ac. of Super.  (ii) (a) Medium black.  (ii) Refer soil analysis, Halvad.
   (iii) 20.11.1956.  (iv) (a) 3 ploughings and 3 barrowings.  (b) Drilling.  (c) 80 lb./ac.  (d) 9".  (e) --.  (v)
   Nil.  (vi) N.P.-710.  (vii) Irrigated.  (viii) Nil.  (ix) 33.75".  (x) 19 and 20.3.1957.

2. TREATMENTS:
   100 lb./ac. of A/S applied.  T_1 = as a soaking dose (10.11.1956).  T_2 = at the time of sowing (18.11.1956).

3. DESIGN:
   (i) R.B.D.  (ii) (a) 3.  (b) N.A.  (iii) 6.  (iv) (a) 40'x13'.  (b) 34'x6.75'.  (v) N.A.  (vi) Yes.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1501 lb./ac. (ii) 174.9 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1458</td>
<td>1540</td>
<td>1506</td>
</tr>
</tbody>
</table>

S.E./mean \( = 71.42 \) lb./ac.

---

**Crop**: Wheat.

**Site**: Agri. Res. Stn., Halvad.

**Object**: To study the response of Wheat to different micro-nutrients.

1. BASAL CONDITIONS:
(i) (a) Legumes—cereal—cotton. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 30.11.1959. (iv) (a) 2 harrowings and 3 drill cultivations. (b) Drilling. (c) 60 lb./ac. (d) 9". (e) —. (v) 100 lb./ac. of A/N and 100 lb./ac. of \( \text{P}_2\text{O}_5 \). (vi) N.P.—710. (vii) Irrigated. (viii) 3 weedings. (ix) Nil. (x) 27.3.1960.

2. TREATMENTS:
Same as in Expt. no. 56(5) on page 44.

3. DESIGN:
(i) R.B.D. Fact. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 30' x 15'. (b) 24' x 12'. (v) 3' x 1.5'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Light attack of grass hoppers and stem-borer. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) Junagadh. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1325 lb./ac. (ii) 237.3 lb./ac. (iii) None of the effects and their interactions is significant. (iv) Mean and differential response in lb./ac.

<table>
<thead>
<tr>
<th>Differential response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean response</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zn</td>
<td>—</td>
<td>—</td>
<td>—25.57</td>
<td>45.85</td>
<td>—21.93</td>
</tr>
<tr>
<td>Mn</td>
<td>10.14</td>
<td>—</td>
<td>—</td>
<td>—24.72</td>
<td>7.38</td>
</tr>
<tr>
<td>Cu</td>
<td>35.05</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—24.72</td>
</tr>
<tr>
<td>Mo</td>
<td>8.67</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>B</td>
<td>9.90</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>16.28</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

S.E. of mean response \( = 41.96 \) lb./ac.

S.E. of differential response \( = 59.33 \) lb./ac.
Crop :- Wheat.  
Ref :- Gj. 57(127).  
Type :- ‘M’.  

Object :- To study the residual effect of $P_2O_5$ applied to previous crop Mug on the yield of Wheat crop.

1. BASAL CONDITIONS :
(i) (a) Wheat—Mug. (b) Mug. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 31.10.1957. (iv) (a) 4 ploughings, 3 harrowings. (b) Drilling. (c) 60 lb./ac. (d) 9’ between rows. (e) —. (v) Nil. (vi) N.P.-710. (vii) Irrigated. (viii) Nil. (ix) 15’. (x) 17.2.1958.

2. TREATMENTS :
1. 0 lb./ac. of $P_2O_5$.
2. 16 lb./ac. of $P_2O_5$ every year.
3. 16 lb./ac. of $P_2O_5$ alternate years.
4. 32 lb./ac. of $P_2O_5$ every year.
5. 32 lb. ac. of $P_2O_5$ alternate years.

Treatments applied to previous Mug crop.

3. DESIGN :
(i) R.B.D. (ii) ‘a’ 5. (b) N.A. (iii) 4’. (iv) (a) 51’x18’. (b) 45’x12.75’. (v) 3’. (vi) Yes.

4. GENERAL :
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) and (b; N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 1222 lb./ac. (ii) 109 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1280</td>
<td>1172</td>
<td>1201</td>
<td>1242</td>
<td>1213</td>
</tr>
</tbody>
</table>

S.E./mean = 54.77 lb./ac.

Crop :- Wheat.  
Ref :- Gj. 58(21).  
Type :- ‘M’.  

Object :- To study the residual effect of $P_2O_5$ on Wheat.

1. BASAL CONDITIONS :
(i) (a; and ‘b N.A. (c) As per treatments. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 13.11.1958. (iv) (a) 2 ploughings, 2 harrowings. (b) Drilling. (c) 60 lb./ac. (d) 9’ between rows. (e) —. (v) 200 lb./ac. of A/S broadcast on 7.11.1958. (vi) N.P.-710. (vii) Irrigated. (viii) 2 intercultures. (ix) N.A. (x) 3.3.1959.

2. TREATMENTS :
Same as in Expt. no. 57(127) above.

3. DESIGN :
(i) R.B.D. (ii) ‘a’ 5. (b) N.A. (iii) 4’. (iv) (a) 51’x18’. (b) 45’x12’. (v) 3’. (vi) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 1155 lb./ac. (ii) 118.0 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.
Treatments

Av. yield.  1183  1102  1118  1284  1089
S.E./mean = 59.0 lb./ac.

Crop :- Wheat.

Object :- To study the residual effect of P₂O₅ applied to previous Mug crop on the subsequent rabi crop Wheat.

1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton. (b) Mug. (c) As per treatments. (ii) (a) Medium black. (b) Refer
   soil analysis, Halvad. (iii) 22.11.1959. (iv) (a) 3 ploughings ; 2 harrowings. (b) Drilling. (c) 60 lb./ac-
   (d) 9' between rows. (e) —. (v) Nil. (vi) N.P.-710. (vii) Irrigated. (viii) 3 weedings. (ix) Nil. (x)
   23.3.1960.

2. TREATMENTS:
   1. Control.
   2. 16 lb./ac. of P₂O₅ every year.
   3. 16 lb./ac. of P₂O₅ alternate year.
   4. 32 lb./ac. of P₂O₅ every year.
   5. 32 lb./ac. of P₂O₅ alternate year.

Manures applied to previous mug crop.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 51'×18'. (b) 45'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Slight lodging due to stormy winds and rains. (ii) Light attack of grass hoppers and stem borer. (iii)
   Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Yes.

5. RESULTS:
   (i) 579.6 lb./ac. (ii) 130.7 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain
   in lb./ac.

   Treatment
   1  2  3  4  5
   Av. yield  507  552  566  665  608
   S.E./mean = 65.34 lb./ac.

Crop :- Wheat.
Site :- Agri. Res. Farm, Jamnagar.

Object :- To find out the N and P₂O₅ requirements of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 4.11.1956. (iv) (a) N.A. (b)
   Drilling. (c) 100 lb./ac. (d) 9' between rows. (e) —. (v) Nil. (vi) N.P.-798. (vii) Irrigated. (viii) N.A.
   (ix) Nil. (x) 14.3.1957.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N : N₀=0, N₁=20, N₂=30 and N₃=40 lb./ac.
   (2) 3 levels of P₂O₅ : P₀=0, P₁=18 and P₂=36 lb./ac.

3. DESIGN:
   (i) R.B.D. Fact. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) N.A. (b) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1712 lb./ac. (ii) N.A. (iii) Main effects and interaction are 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>(N_3)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(P_0)</td>
<td>1200</td>
<td>1500</td>
<td>1717</td>
<td>1600</td>
<td>1504</td>
</tr>
<tr>
<td>(P_1)</td>
<td>1600</td>
<td>1966</td>
<td>1866</td>
<td>1833</td>
<td>1816</td>
</tr>
<tr>
<td>(P_2)</td>
<td>1433</td>
<td>1733</td>
<td>1666</td>
<td>2133</td>
<td>1816</td>
</tr>
<tr>
<td>Mean</td>
<td>1411</td>
<td>1733</td>
<td>1850</td>
<td>1855</td>
<td>1712</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Site: Agri. Res. Farm, Jamnagar.
Object: To study the effect of different micro-nutrients on yield of Wheat.

1. BASAL CONDITIONS:
(i) N.A. (b) Sann. (c) Nil. (ii) (a) Clayey loam to medium black. (b) Refer soil analysis, Jamnagar. (iii) 2.11.1959. (iv) (a) 1 ploughing and 1 harrowing. (b) to (c) N.A. (v) Sann G.M. (vi) N.P.-718 (early). (vii) Irrigated. (viii) 1 weeding, 1 Interclabling. (ix) 30°. (x) 17.3.1960.

2. TREATMENTS:
Same as in Expt. no. 56(5) on page 44.

3. DESIGN:
(i) 25 Fact. in R.B.D. (ii) (a) 32. (b) 123×58'. (iii) 4. (iv) (a) 15'×17'. (b) 10'×12'. (v) 2.5' around the net plot. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1010 lb./ac. (ii) 373.9 lb./ac. (iii) Response to Zn alone is significant. (iv) Mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Zn 135.6</td>
<td>127.0</td>
<td>144.2</td>
<td>175.8</td>
<td>95.4</td>
<td>95.5</td>
</tr>
<tr>
<td>Mn -73.6</td>
<td>-82.2</td>
<td>-65.0</td>
<td>-99.4</td>
<td>-47.8</td>
<td>-77.2</td>
</tr>
<tr>
<td>Cu -39.1</td>
<td>1.1</td>
<td>-79.3</td>
<td>-64.9</td>
<td>-13.3</td>
<td>-29.7</td>
</tr>
<tr>
<td>Mo 85.2</td>
<td>45.1</td>
<td>125.3</td>
<td>81.6</td>
<td>88.8</td>
<td>154.0</td>
</tr>
<tr>
<td>B -48.7</td>
<td>-32.4</td>
<td>-65.0</td>
<td>-145.4</td>
<td>48.0</td>
<td>-32.4</td>
</tr>
</tbody>
</table>

S.E. of mean response = 66.11 lb./ac.
S.E. of differential response = 93.48 lb./ac.
Object: To find the optimum dose of N and P₂O₅ for Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) Sann-hemp G.M.  (c) N.A.  (ii) (a) Medium black, 2' to 2½' deep.  (b) Refer soil analysis, Junagadh.  (iii) 2.11.1957.  (iv) (a) 1 ploughing and 1 to 2 harrowings.  (b) Drilling.  (c) 60 lb./ac.  (d) Between rows—12", between plants—irregular.  (e) N.A.  (v) Nil.  (vi) S-56 medium.  (vii) Irrigated.  (viii) 2 weedings and 4 interculturings.  (ix) Nil.  (x) 9.2.1957.

2. TREATMENTS:
   Main-plot treatments:
   3 levels of N as A/S: N₀=0, N₁=20 and N₂=30 lb./ac.
   Sub-plot treatments:
   4 levels of P₂O₅ as Super: P₀=0, P₁=20, P₂=30 and P₃=40 lb./ac.
   P₂O₅ was drilled before sowing, N applied (i) at the time of sowing, (ii) one month after sowing and (iii) at the time of flag leaf emergence.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 3 main-plots/block, 4 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 32' × 16'.  (b) 27' × 11'.  (v) 2½' around the net plot.  (vi) Yes.

4. GENERAL:
   (i) The crop was healthy. No lodging.  (ii) Slight rust attack, damage negligible. No control measures were taken.  (iii) Days of earing, height, grain yield, and spikelet numbers.  (iv) (a) 12½—contd.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1566 lb./ac.  (ii) (a) 450.3 lb./ac.  (b) 202.7 lb./ac.  (iii) Main effect of P₂O₅ is highly significant. Main effect of N and interaction N×P 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>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>1172</td>
<td>1317</td>
<td>1374</td>
<td>1288</td>
</tr>
<tr>
<td>P₁</td>
<td>1404</td>
<td>1728</td>
<td>1665</td>
<td>1599</td>
</tr>
<tr>
<td>P₂</td>
<td>1563</td>
<td>1843</td>
<td>1655</td>
<td>1687</td>
</tr>
<tr>
<td>P₃</td>
<td>1601</td>
<td>1629</td>
<td>1846</td>
<td>1692</td>
</tr>
<tr>
<td>Mean</td>
<td>1435</td>
<td>1629</td>
<td>1635</td>
<td>1566</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 159.2 lb./ac.
2. P marginal means = 82.6 lb./ac.
3. P means at a level of N = 143.3 lb./ac.
4. N means at a level of P = 201.8 lb./ac.
2. TREATMENTS:
Same as in Expt. no. 56(46) on page 59.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 30' × 12'. (b) 24' × 7'. (v) 3 rows on each side. (vi) Yes.

4. GENERAL:
(i) Growth was good, No lodging. (ii) Attack of rust on stems—a considerable damage, hence no control measures were taken. (iii) Height, earing date, No. of spikelets and grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS:
(i) 1850 lb./ac. (ii) (a) 198.1 lb./ac. (b) 134.7 lb./ac. (iii) Main effects of N and P are highly significant. Interaction N × P is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>1388</td>
<td>1867</td>
<td>1639</td>
<td>1996</td>
<td>1723</td>
</tr>
<tr>
<td>P₁</td>
<td>1800</td>
<td>1961</td>
<td>1902</td>
<td>1982</td>
<td>1911</td>
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<td>P₂</td>
<td>1528</td>
<td>1966</td>
<td>1932</td>
<td>1993</td>
<td>1855</td>
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<tr>
<td>P₃</td>
<td>1606</td>
<td>1961</td>
<td>1867</td>
<td>2212</td>
<td>1912</td>
</tr>
<tr>
<td>Mean</td>
<td>1581</td>
<td>1939</td>
<td>1835</td>
<td>2046</td>
<td>1850</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 70.0 lb./ac.
2. P marginal means = 47.6 lb./ac.
3. P means at a level of N = 95.3 lb./ac.
4. N means at a level of P = 108.2 lb./ac.

Crop:—Wheat.
Site:—Central Expt. Stn., Junagadh.
Object:—To find the optimum dose of N and P₂O₅ for Wheat.
Crop :- Wheat.  
Ref :- Gj. 56(111).  
Type :- 'M'.

Object :- To study the effect of different manures on the yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Bajra. (c) N.A.  (ii) Medium black.  (b) Refer soil analysis, Umrala. (iii) 1.11.1956. (iv) (a) N.A. (b) Drilling. (c) 90 lb./ac.  (d) 18" between rows.  (e)  .  (v) Nil. (vi) Kenphad. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 9.3.1957.

2. TREATMENTS :
   All combinations of (1), (2) and (3)  
   (1) 2 levels of N as A/S : N₀=0 and N₁=10 lb./ac.  
   (2) 2 levels of P₂₀ as Super : P₀=0, and P₁=9 lb./ac.  
   (3) 2 levels of F.Y.M. : F₀=0. F₁=2000 lb./ac.  
   Time and method of application N.A.

3. DESIGN :
    (i) 2² Fact. in R.B.D.  (ii) (a) 8.  (b)  .  (iii) 4.  (iv) (a) N.A.  (b) 45’x12’. (v) N.A.  (vi) Yes.

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

5. RESULTS :
   (i) 547 lb./ac.  (ii) 116.3 lb./ac.  (iii) None of the effects and interactions is significant.  
   (iv) Av. yield of grain in lb./ac.

     | N₀  | N₁  | Mean | F₀  | F₁  |
     |-----|-----|------|-----|-----|
     | 474 | 600 | 537  | 540 | 555 |
     | 540 | 575 | 557  | 592 | 522 |
     | 540 | 593 | 547  | 566 | 528 |

   S.E. of marginal means = 29.1 lb./ac.  
   S.E. of body of table = 41.1 lb./ac.
Crop :- Wheat.
Object :- To find out the N and P₂O₅ requirements of Wheat.

1. BASAL CONDITIONS :

2. TREATMENTS :
All combinations of (1) and (2).
(1) 2 levels of N as A/S : N₀ = 0 and N₁ = 30 lb./ac. (2) 3 levels of P₂O₅ as Super : P₀ = 0, P₁ = 18 and P₂ = 36 lb./ac. N applied on 26.12.1955 and P₂O₅ applied at sowing.

3. DESIGN :

4. GENERAL :

5. RESULTS :
(i): 1714 lb./ac. (ii): 112.8 lb./ac. (iii): Main effects of N and P are highly significant. Interaction N x P is not significant. (iv): Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1189</td>
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<td>2117</td>
</tr>
<tr>
<td>Mean</td>
<td>1361</td>
<td>1824</td>
<td>1957</td>
</tr>
</tbody>
</table>

S.E. of N marginal means = 26.6 lb./ac.
S.E. of P marginal means = 32.6 lb./ac.
S.E. of body of table = 46.1 lb./ac.

Crop :- Wheat.
Object :- To find out the N and P₂O₅ requirements of Wheat.

1. BASAL CONDITIONS :

2. TREATMENTS :
All combinations of (1) and (2).
(1) 2 level of N as A/S : N₀ = 0, N₁ = 30 lb./ac. (2) 3 level of P₂O₅ as Super : P₀ = 0, P₁ = 18 and P₂ = 36 lb./ac. N applied at sowing and P₂O₅ before sowing.

3. DESIGN :
4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1955-contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1376 lb./ac. (ii) 170.6 lb./ac. (iii) Main effects of N and P are highly significant. N x P is 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>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
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<td>1301</td>
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<td>1285</td>
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<tr>
<td>N₁</td>
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<td>1603</td>
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<tr>
<td>Mean</td>
<td>1192</td>
<td>1452</td>
<td>1485</td>
<td>1376</td>
</tr>
</tbody>
</table>

S.E. of N marginal means = 40.2 lb./ac.
S.E. of P marginal means = 49.2 lb./ac.
S.E. of body of table = 69.6 lb./ac.

Crop: Wheat.
Object: To find out the N and P₂O₅ requirements of Wheat.

1. BASAL CONDITIONS:
(i) (a) No. (b) Sann hemp as G.M. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 29.10.1957. (iv) (a) Two ploughings and two harrowings. (b) to (e) N.A. (v) Nil. (vi) Kenphad-28. (vii) Irrigated. (viii) Weeding on 27.12.1956. (ix) Nil. (x) 3.3.1958.

2. TREATMENTS:
Same as in Expt. no. 56(102) on page 62.

3. DESIGN:
(i) 2 x 3 Fact. in L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 21' x 26'. (b) 15' x 20'. (v) 3' all round the net plot. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Rust attack. (iii) Height of plants, no. of tillers and grain yield. (iv) (a) 1955-57. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1331 lb./ac. (ii) 218.8 lb./ac. (iii) Main effect of P is highly significant. Main effect of N and interaction N x P 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>
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</thead>
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<td>1361</td>
<td>1595</td>
<td>1298</td>
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</tr>
<tr>
<td>Mean</td>
<td>1001</td>
<td>1393</td>
<td>1600</td>
<td>1331</td>
</tr>
</tbody>
</table>

S.E. of N marginal means = 51.6 lb./ac.
S.E. of P marginal means = 63.1 lb./ac.
S.E. of body of table = 89.3 lb./ac.
Crop :- Wheat.

Objective: To find out the economic dose of N for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) 30 lb./ac. of N as manure mixture. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 25.11.1956. (iv) (a) One harrowing. (b) Drilling. (c) 30 lb./ac. (d) 9" between rows. (e) N.A. (v) Nil. (vi) Kenphad-28. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 18.3.1957.

2. TREATMENTS:
   1. Control (no manure)
   2. 0 lb./ac. of N + 18 lb./ac. of P
   3. 20 lb./ac. of N + 18 lb./ac. of P
   4. 40 lb./ac. of N + 18 lb./ac. of P
   5. 60 lb./ac. of N + 18 lb./ac. of P
   6. 80 lb./ac. of N + 18 lb./ac. of P
   7. 100 lb./ac. of N + 18 lb./ac. of P
   N as A.S and P as Super applied in furrows after sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 12' x 13'. (b) 6' x 24'. (v) 3' all round the net plot. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Height in cm. no. of tillers, length and no. of spikelets, grain and fodder yield. (iv) a. N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1349 lb./ac. (ii) 223.2 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

   Treatment  
   1  2  3  4  5  6  7
   Av. yield 1104 1338 1437 1301 1422 1361 1482
   S.E./mean = 99.8 lb./ac.

---

Crop :- Wheat.  

Objective: To find out the economic dose of N for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sann hemp for G.M. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 2.11.1957. (iv) (a) and (b) The sann was buried with iron plough, then one wooden ploughing followed by two harrowings. (c) to (e) N.A. (v) Nil. (vi) Kenphad-28. (vii) Irrigated. (viii) One weeding. (ix) Negligible. (x) 3.3.1958.

2. TREATMENTS:
   6 levels of N: N$_1$=0, N$_2$=20, N$_3$=40, N$_4$=60, N$_5$=80 and N$_6$=103 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 24' x 18'. (b) 18' x 12'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Height in cm. no. of tillers, length and no. of spikelets, grain and fodder yield. (iv) a. N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS:
   (i) 924 lb./ac. (ii) 232.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
Object:—To find out the suitable time of application of N to Wheat crop under irrigated conditions.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Local Jowar. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 13.11.1957. (iv) (a) Two ploughings and two harrowings. (b) to (e) N.A. (v) Nil. (vi) Kenphad-28. (vii) Irrigated. (viii) N.A. (ix) Negligible. (x) 8.3.1958.

2. TREATMENTS:
   40 lb./ac. of N as A/S applied at:—T1=sowing time, T2=tillering, T3=flag leaf stage, T4=at sowing+at tillering and T5=at sowing+at tillering+at flag leaf stage.

3. DESIGN:
   (i) L. Sq. (ii) 5. (b) N.A. (iii) 5. (iv) (a) 12'×15'. (b) 9'×12'. (v) 1½ all round the net plot. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Height and number of tillers. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 715 lb./ac. (ii) 176.5 lb./ac. (iii) Treatments differences are not significant. (iv) Av. yield of grain in lb./ac.

   Treatments                              T1  T2  T3  T4  T5
   Av. yield                                741 671 786 691 686
   S.E./mean                                =78.9 lb./ac.

Crop :- Wheat.                        Ref :- Gj. 57(80).
Site :- Agri. Res. Stn., Umrala.       Type :- 'M'.

Object:—To study the effect of micro-nutrients on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 25.11.1959. (iv) (a) One ploughing, one harrowing. (b) Drilling. (c) 60 lb./ac. (d) and (e) N.A. (v) Nil. (vi) N.P.-718. (vii) Irrigated. (viii) Nil. (ix) 25.98° for the whole year. (x) N.A.

2. TREATMENTS:
   Same as in Expt. no. 56(5) on page 44.

3. DESIGN:
   (i) 2² Fact. in R.B.D. (ii) 32. (b) N.A. (iii) 4. (iv) (a) 18'×15'. (b) 15'×12'. (v) 1.5' all round the net plot. (vi) Yes.

4. GENERAL:
   (i) Not satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1959-contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 289 lb./ac.  (ii) 129.59 lb./ac.  (iii) Interaction Mn \times B is significant.  (iv) Mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th>Differential response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
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<tbody>
<tr>
<td>Mean response</td>
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<td>15.50</td>
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<tr>
<td>Mn</td>
<td>37.58</td>
<td>7.97</td>
<td>67.19</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cu</td>
<td>2.95</td>
<td>11.27</td>
<td>-5.37</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mo</td>
<td>40.16</td>
<td>35.77</td>
<td>44.55</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>B</td>
<td>-16.49</td>
<td>-5.98</td>
<td>-27.00</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

| S.E. of differential response | =32.40 lb./ac. |
| S.E. of mean response         | =22.91 lb./ac. |

Crop :- Wheat.  
Site :- Agri. Res. Stn., Vijapur.  
Ref :- Gj. 55(61).  
Type :- 'M'.

Object :- To determine the effect of different micro-nutrients on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Bajra and Wheat.  (c) 8 C.L. of F.Y.M./ac.  (ii) (a) Sandy loam. (b) N.A.  (iii) 21.11.1955.  
(iv) (a) N.A. (b) Drilling.  (c) 50 lb./ac. (d) 12" apart. (e) N.A.  (v) (a) 1-1/2" grate.  (b) 12" x 12". (c) 6. (d) 12" apart. (e) N.A.  (vi) A-206.  (vii) Yes.  (viii) Irrigated. (ix) Nil.  (x) 19.3.1956.

2. TREATMENTS:
Same as in expt. no. 56(5) on page 44 at Arnej.

3. DESIGN:
(i) 2² Fact. in R.B.D.  (ii) 32.  (b) N.A.  (iii) 4.  (iv) (a) 20' x 12'. (b) 16' x 8'. (v) 2' all round the net plot.  (vi) Yes.

4. GENERAL:
(i) Fairly good.  (ii) The crop was attacked by rust and root rot.  (iii) Grain and fodder yield. (iv) Grain and fodder yield. (v) Bajra, Jamnagar.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 3090 lb./ac.  (ii) 1033.9 lb./ac.  (iii) None of the effects is significant.  (iv) Mean and differential responses in lb./ac.
Object:—To study the effect of different micro-nutrients on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cigarette tobacco. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 4.12.1956. (iv) (a) N.A. (b) Broadcasting. (c) 80 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Wheat (A-206). (vii) Irrigated. (viii) Nil. (ix) Nil. (x) 28.3.1957.

2. TREATMENTS:
   Same as in exp. no. 56(5) on page 44 at Arnej.

3. DESIGN:
   (i) 2^5 Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 17' x 15'. (b) 12' x 10'. (v) 2.5' all round the net plot. (vi) Yes.

4. GENERAL:
   (i) The season was characterised by a severe infection of wheat crop by leaf and stem rust. Although the variety grown is fairly resistant to wheat rust, the seed being not pure, the crop was partially attacked by rust, which ultimately affected the total yield and grain size. (ii) The crop was badly affected by wheat rust disease. (iii) Grain and fodder yield. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) Arnej, Jamnagar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2079.9 lb./ac. (ii) 504.8 lb./ac. (iii) Interaction A X E alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>A₀</th>
<th>A₁</th>
<th>B₀</th>
<th>B₁</th>
<th>C₀</th>
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<td>2246</td>
<td>2210</td>
<td>2082</td>
<td>2146</td>
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<td>2116</td>
</tr>
<tr>
<td>E₁</td>
<td>1917</td>
<td>2105</td>
<td>1927</td>
<td>2096</td>
<td>2033</td>
<td>1989</td>
<td>2041</td>
<td>2074</td>
<td>1948</td>
</tr>
<tr>
<td>Mean</td>
<td>2081</td>
<td>2076</td>
<td>1986</td>
<td>2171</td>
<td>2121</td>
<td>2035</td>
<td>2079</td>
<td>2125</td>
<td>2032</td>
</tr>
<tr>
<td>D₀</td>
<td>2105</td>
<td>2145</td>
<td>1946</td>
<td>2304</td>
<td>2174</td>
<td>2076</td>
<td>2069</td>
<td>2095</td>
<td></td>
</tr>
<tr>
<td>D₁</td>
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<td>2007</td>
<td>2027</td>
<td>2242</td>
<td>2074</td>
<td>1976</td>
<td>2011</td>
<td>2047</td>
<td></td>
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<tr>
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<td>2162</td>
<td>2081</td>
<td>2026</td>
<td>2217</td>
<td>2069</td>
<td>2124</td>
<td>2007</td>
<td>2027</td>
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<tr>
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<td>1971</td>
<td>1947</td>
<td>2124</td>
<td>2081</td>
<td>2267</td>
<td>2145</td>
<td>2174</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 63.1 lb./ac.
S.E. of body of any table = 89.2 lb./ac.
2. TREATMENTS:
   Some as in exp. no. 56(5) on Page 44 at Arnej.

3. DESIGN:
   (i) R.B.D. Fact. (ii) (a) 32. (b) N.A. (iii) 4. (iv) 22'×12'. (b) 15'×8'. (v) 2.5'×2'. (vi) Yes.

4. GENERAL:
   (i) Growth was good till flowering but it has been damaged due to occurrence of rust. (ii) Slight attack of white ant and 50% attack of rust. (iii) Grain and fodder yield, height of plant, no. of tillers, length, breadth and height of roots. (iv) (a) 1955-1959. (b) No. (c) Nil. (v) (a) Arnej, Dohad. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 512 lb./ac. (ii) 150.3 lb./ac. (iii) Effect of Cu and interaction Zn×Mo are significant. Others are not significant. (iv) Mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
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</tr>
<tr>
<td>Zn</td>
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</tr>
<tr>
<td>Mn</td>
<td>51.33</td>
<td>84.74</td>
<td>17.92</td>
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</tr>
<tr>
<td>Cu</td>
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<td>29.38</td>
<td>89.62</td>
<td>33.01</td>
<td>85.99</td>
</tr>
<tr>
<td>Mo</td>
<td>23.76</td>
<td>32.79</td>
<td>80.31</td>
<td>26.20</td>
<td>21.32</td>
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<td>-16.84</td>
<td>-36.41</td>
<td>2.73</td>
<td>-2.83</td>
<td>-30.85</td>
</tr>
</tbody>
</table>

S.E. of mean response = 26.57 lb./ac.
S.E. of differential response = 37.57 lb./ac.

Crop :- Wheat.
Site :- Agri. Res. Stn., Vijapur.

Object :- To study the effect of different micro-nutrients on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Light sandy. (b) N.A. (iii) 16.11.1959. (iv) a) Nil. (b) Drilling. (c) 80 lb./ac. (d) 12'. (e) —. (f) Nil. (vi) Arnej-206. (vii) Irrigated. (viii) 2 weedings and 1 interculturing. (ix) 53.81'. (x) 29.2.1960.

2. TREATMENTS:
   Same as in exp. no. 56(5) on page 44 at Arnej.

3. DESIGN:
   (i) 25 Fact. in R.B.D. (ii) (a) 32. (b) 82'×96'. (iii) 4. (iv) (a) 20'×20'. (b) 15'×18'. (v) 2.5'×1'. (vi) Yes.
5. RESULTS:

(i) 204.8 lb/ac.  (ii) 23.60 lb/ac.  (iii) Only interactions Mn×Cu and Mn×Mo are significant. Main effects and other interactions are not significant.  (iv) Mean and differential responses in lb/ac.

### Differential response

<table>
<thead>
<tr>
<th></th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
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</tr>
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<td>+</td>
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<td>+</td>
</tr>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Zn 6.98</td>
<td>—</td>
<td>—</td>
<td>37.35</td>
<td>-23.59</td>
<td>25.07</td>
</tr>
<tr>
<td>Mn -27.96</td>
<td>2.61</td>
<td>58.53</td>
<td>—</td>
<td>—</td>
<td>-65.90</td>
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<td>Cu 6.07</td>
<td>24.16</td>
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<td>-31.87</td>
<td>44.01</td>
<td>—</td>
</tr>
<tr>
<td>Mo 6.64</td>
<td>13.28</td>
<td>0.00</td>
<td>40.95</td>
<td>-27.67</td>
<td>-20.75</td>
</tr>
<tr>
<td>B 8.90</td>
<td>3.74</td>
<td>14.06</td>
<td>8.05</td>
<td>9.75</td>
<td>6.92</td>
</tr>
</tbody>
</table>

S.E. of mean response  = 4.17 lb/ac.
S.E. of differential response  = 5.90 lb/ac.

### Crop - Wheat.

**Site:** Agri. Res. Stn., Vijapur.

Object: To find out the optimum requirements of N for Wheat.

1. BASAL CONDITIONS:

(i) (a) N.A.  (b) N.A.  (c) N.A.  (ii) (a) Light sandy.  (b) N.A.  (iii) 1.12.1958.  (iv) (a) Nil.  (b) Drilling.  (c) 80 lb/ac.  (d) 12".  (e) —.  (v) Nil.  (vi) N-345.  (vii) Irrigated.  (viii) 1 weeding and 2 interculturings.  (ix) 25.77".  (x) 1.4.1959.

2. TREATMENTS:

1. 60 lb/ac. of N as A/S in two doses.
2. 40 lb/ac. of N as A/S in two doses.
3. Control.


3. DESIGN:

(i) R.B.D.  (ii) (a) 3.  (b) 40'×42'.  (iii) 6.  (iv) (a) 40'×14'.  (b) 36'×12'.  (v) 2'×1'.  (vi) Yes.

4. GENERAL:

(i) Fair.  (ii) Nil.  (iii) Grain and fodder yield.  (iv) (a) 1957-1959.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 521 lb/ac.  (ii) 148.3 lb/ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>665</td>
<td>621</td>
<td>278</td>
</tr>
</tbody>
</table>

S.E./mean  = 60.6 lb/ac.

### Crop - Wheat.

**Site:** Agri. Res. Stn., Vijapur.

Object: To find out the optimum requirements of N for Wheat.

Ref: Gj. 58(62).  Type: 'M'.

---
1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Light sandy. (b) N.A. (iii) 18.11.1959. (iv) (a) Nil. (b) Drilling. (c) 80 lb./ac. (d) 12°. (e) N.A. (f) Nil. (vi) N.P.-710. (vii) Irrigated. (viii) 3 weedings and 1 inter-culturing. (ix) 53.81°. (x) 17.3.1960.

2. **TREATMENTS**:
   1. 60 lb./ac. of N as A/S in two doses.
   2. 40 lb./ac. of N as A/S in two doses.
   3. 20 lb./ac. of N as A/S in two doses.
   4. Control.


3. **DESIGN**:
   (i) R.B.D. (ii) (a) 4. (b) 38'×72'. (iii) 4. (iv) (a) 38'×18'. (b) 34'×16'. (v) 2'×1'. (vi) Yes.

4. **GENERAL**:
   (i) Good. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1957—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   (i) 845 lb./ac. (ii) 119.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
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<th>1</th>
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<td>900</td>
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   S.E., mean = 59.7 lb./ac.

---

**Crop:** Wheat *(Rabi)*  
**Site:** M.A.E. Farm, Umraula.  
**Ref:** Gj. 56 (MAE).  
**Type:** 'M'.

Object:—Type 4—To study the residual effect of P<sub>2</sub>O<sub>5</sub> applied to legumes and direct effect of N on Wheat crop.

1. **BASAL CONDITIONS**:
   (i) (a) Legumes—Wheat. (b) and (c) As per treatments. (ii) (a) Medium black soil of trap and gneissic origin. (b) N.A. (iii) 15.11.1956. (iv) (a) 2 ploughings and 2 harrowings. (b) Drilling. (c) 90 lb./ac. (d) Rows 9' apart. (c) N.A. (v) Nil. (vi) Kenphad—28. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 12.3.1957.

2. **TREATMENTS**:
   All combinations of (1) and (2) + a control (fallow L<sub>3</sub>P<sub>2</sub>).
   (1) 3 levels of P<sub>2</sub>O<sub>5</sub> as single Super applied to legumes: P<sub>0</sub>=0, P<sub>1</sub>=40 and P<sub>2</sub>=80 lb./ac.
   (2) 2 legumes: L<sub>1</sub>=Groundnut and L<sub>2</sub>=Sesamum.

   **Sub-plot treatments**:
   3 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=15 and N<sub>2</sub>=30 lb./ac.

3. **DESIGN**:
   (i) Split-plot. (ii) (a) 7 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 14½'×12'. (b) 12'×9'. (v) N.A. (vi) Yes.

4. **GENERAL**:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Nil.

5. **RESULTS**:
   (i) 1401 lb./ac. (ii) (a) 312.2 lb./ac. (b) 277.1 lb./ac. (iii) Only P effect is significant. (iv) Av. yield of grain in lb./ac.
Crop: Wheat (Rabi).
Site: M.A.E. Farm, Umrala.
Object: Type 4—To study the residual effect of $P_2O_5$ applied to legumes and direct effect of $N$ on Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Legumes—Wheat. (b) and (c) As per treatments. (ii) (a) Medium black soil of trap and gneissic origin. (b) N.A. (iii) 2nd week of Nov. 1957. (iv) (a) 2 ploughings, 2 harrowings. (b) Drilling. (c) 90 lb./ac. (d) Rows 9" apart. (e) — (f) Nil. (vi) Kenphad—28. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 2nd week of March, 1958.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 56 (MAE) on page 70.

5. RESULTS:
   (i) 1331 lb./ac. (ii) (a) 190.7 lb./ac. (b) 170.5 lb./ac. (iii) Only $L$ and $P$ effects are highly significant. (iv) Av. yield of grain in lb./ac.

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Mean 1495 1112 1367 1457 1336 1381 1656 1401

S.E. of difference of two marginal means:
1. LP marginal means = -147.2 lb./ac.
2. N marginal means = 85.5 lb./ac.
3. N means at the same level of LP = 226.3 lb./ac.
4. LP means at the same level of N = -236.2 lb./ac.

Crop: Wheat (Rabi).
Site: M.A.E. Farm, Umrala.
Object: Type 4—To study the residual effect of $P_2O_5$ applied to legumes and direct effect of $N$ on Wheat crop.

Ref: Gj. 57 (MAE).
Type: ‘M’.

Ref: Gj. 58 (MAE).
Type: ‘M’.
1. BASAL CONDITIONS:
(i) (a) Legumes—Wheat. (b) and (c) As per treatments. (ii) (a) Medium black soil of trap and gneissic origin. (b) N.A. (iii) Nov. 1958. (iv) (a) 2 ploughings and 2 harrowings. (b) Drilling. (c) 90 lb./ac. (d) Rows 9" apart. (e) —. (v) Nil. (vi) Kenphad—28. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) March. 1959.

2. TREATMENTS: to 4. GENERAL:
Same as in exp. no. 56(MAE) on page 70.

3. RESULTS:
(i) 1019 lb./ac. (ii) (a) 195.6 lb./ac. (b) 116.3 lb./ac. (iii) L, control vs. other LP effects and interaction N x control vs. others are significant. N effect is highly 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. LP marginal means = 92.2 lb./ac.
2. N marginal means = 35.9 lb./ac.
3. N means at the same level of LP = 95.0 lb./ac.
4. LP means at the same level of N = 120.5 lb./ac.

Crop :- Wheat (Rabi).

Site :- M.A.E. Farm, Umrala,

Object :- Type 4—To study the residual effects of P_2O_5 applied to legumes and direct effect of N on Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Legumes—Wheat. (b) and (c) As per treatments. (ii) (a) Medium black. (b) N.A. (iii) 2.11.1959. (iv) (a) One ploughing and two harrowings. (b) Drilling. (c) 80 lb./ac. (d) 9". (e) —. (v) Nil. (vi) N.P. 718 medium. (vii) Irrigated. (viii) 2 weedings. (ix) 25.98°. (x) 26.2.1960.

2. TREATMENTS: to 4. GENERAL:
Same as in exp. no. 56(MAE) on page 70.

5. RESULTS:
(i) 658 lb./ac. (ii) (a) 190.2 lb./ac. (b) 157.7 lb./ac. (iii) Only P effect is significant. (iv) Av. yield of grain in lb./ac.

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</table>

S.E. of difference of two
1. LP marginal means = 89.7 lb./ac.
2. N marginal means = 48.7 lb./ac.
3. N means at the same level of LP = 128.8 lb./ac.
4. LP means at the same level of N = 138.2 lb./ac.

Ref :- Gj. 59 (MAE).

Type :- 'M'.
Crop: Wheat (Rabi).
Site: M.A.E., Farm, Umdalla.
Object: Type 2—To study the long term effect of three levels each of N, P, K and two levels of bulky
manure on three-course rotation crops.

1. BASAL CONDITIONS:
(i) (a) Jowar—Wheat—Cotton—Fallow. (b) Jowar. (c) As per treatments. (ii) (a) Medium black soil
of trap and gneissic origin. (b) N.A. (iii) 2nd week of November. (iv) (a) 2 ploughings and 2 harrowings.
(b) N.A. (c) 90 lb./ac. (d) N.A. (e) N.A. (v) N.A. (vi) Kenphad-28. (vii) Irrigated. (viii) One
weeding. (ix) N.A. (x) 2nd week of March.

2. TREATMENTS:
Main-plot treatments:
2 levels of FYM: \( F_0 = 0 \) and \( F_1 = 5000 \) lb./ac. of FYM.
Sub-plot treatments:
All combinations of (1), (2) and (3)
(1) 3 levels of \( N \): \( N_0 = 0 \), \( N_1 = 30 \) and \( N_2 = 60 \) lb./ac.
(2) 3 levels of \( P_2 O_5 \): \( P_0 = 0 \), \( P_1 = 30 \) and \( P_2 = 60 \) lb./ac.
(3) 3 levels of \( K_2 O \): \( K_0 = 0 \), \( K_1 = 30 \) and \( K_2 = 60 \) lb./ac.

3. DESIGN:
(i) Split-plot confd. (ii) (a) 2 main-plots/replication; 3 sub-blocks/main-plot and 9 sub-plots/sub-block.
(b) N.A. (iii) 1. (iv) (a) 30'X15'. (b) 24'X12'. (v) 3'X1.5'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1957 (kharif)—contd. (b) Yes. (c) Nil. (v) Nil.
(vi) and (vii) Nil.

5. RESULTS:
(i) 905 lb./ac. (ii) (a) 369.0 lb./ac. (b) 104.5 lb./ac. (iii) P effect is highly significant. Interactions NP,
PK, NPK and FP are significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

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</table>

S.E. of difference of two

1. \( F \) marginal means = 100.4 lb./ac.
2. N, P or K marginal means = 34.8 lb./ac.
3. N, P, or K means at the same level of F = 49.3 lb./ac.
4. F means at the same level of N, P, or K = 108.2 lb./ac.
5. Means in the body of \( N \times P \), \( N \times K \), or \( P \times K \) table = 60.3 lb./ac.
Crop: Wheat (Rabi).
Site: M.A.E. Farm, Umrala.

Object: Type 2—To study the long term effect of three levels each of N, P, K and two levels of bulky manure on three-course rotation crops.

1. BASAL CONDITIONS: to 4. GENERAL:
   Same as in expt. no. 57(MAE), on page 73.

5. RESULTS:
   (i) 1553 lb./ac. (ii) (a) 116.8 lb./ac. (b) 262.3 lb./ac. (iii) Interaction NK alone is significant. (iv) Av. yield of grain in lb./ac.

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<th>N₂</th>
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S.E. of difference of two
1. F marginal means = 31.8 lb./ac.
2. N, P or K marginal means = 87.4 lb./ac.
3. N, P or K means at the same level of F = 123.6 lb./ac.
4. F means at the same level of N, P or K = 105.8 lb./ac.
5. Means in the body of N×P, N×K or P×K tables = 151.4 lb./ac.

---

Crop: Wheat (Rabi).
Site: M.A.E. Farm, Umrala.

Object: Type 2—To study the long term effect of three levels each of N, P, K and two levels of bulky manure on three-course rotation crops.

1. BASAL CONDITIONS:
   (i) 'a' Wheat—Cotton — Jowar. (b) Jowar. (c) As per treatments. (ii) Medium black. (iii) 2.11.1959. (iv) (a) One ploughing, 2 harrowings. (b) Drilling. (c) 80 lb./ac. (d) Rows 9" apart. (e) — (f) Nil. (v) N.P. 718 (medium). (vi) Irrigated. (vii) 2 weedings. (ix) 25.98°. (x) 6.3-1960.

2. TREATMENTS: to 4. GENERAL:
   Same as in expt. no. 57(MAE) on page 73.

5. RESULTS:
   (i) 657 lb./ac. (ii) 'a' 90.9 lb./ac. (b) 117.9 lb./ac. (iii) P effect alone is significant. (iv) Av. yield of grain in lb./ac.
Crop: Wheat (Rabi).

Site: Mahasana.

Object: To study the effect of different doses and sources of N on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Alluvial—sandy loam—pH 8.1. (iii) to (vi) N.A. (vii) Mid. October. (viii) Irrigated.

2. TREATMENTS:
   0 = Control (no manure).
   N1 = 20 lb./ac. of N as A/S
   N2 = 40 lb./ac. of N as A/S
   N'1 = 20 lb./ac. of N as Urea
   N'2 = 40 lb./ac. of N as Urea

3. DESIGN:
   (i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat in the selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out.

4. GENERAL:
   (i) Normal. (ii) Black rust attack. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   Treatment: 0 N1 N2 N'1 N'2
   Av. yield: 1486 1688 1721 1707 1846
   G.M. = 1690 lb./ac.; S.E./mean = 40.3 lb./ac. No. of trials = 27.
Crop: Wheat (Rabi).  
Site: Mahasana.

Object: Type V—To study the effect of different doses and sources of N on Wheat.

1. BASAL CONDITIONS: to 2. TREATMENTS:
   Same as in exp. no. 54(SFT) type I on page 75.

3. DESIGN:
   Same as in exp. no. 54(SFT) type I on page 75.

4. GENERAL:
   (i) Normal. Partial lodging. (ii) Incidence of rust in about 15% of the experimental fields and in few cases there was slight damage by rats. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) N.A. (v) No. (vi) and (vii) Nil.

5. RESULTS:

\[
\begin{array}{c|cccc|c}
\text{Treatment} & 0 & N_1 & N_2 & N_1' & N_2' \\
\hline
\text{Av. yield} & 1693 & 1878 & 2065 & 2065 & 2139 \\
\text{G.M.} & -1968 \text{lb./ac.} ; & \text{S.E./mean} & =44.5 \text{lb./ac. and no. of trials} & =34.
\end{array}
\]

Crop: Wheat (Rabi).  
Site: Mahasana.

Object: Type V—To study the effect of different doses and sources of N on Wheat.

1. BASAL CONDITIONS:
   Same as in exp. no. 54(SFT) type I on page 75.

2. TREATMENTS:

\[
\begin{array}{c|c|c|c|c|c}
\text{0} & \text{N}_1 & \text{N}_2 & \text{N}_1' & \text{N}_2' \\
\hline
\text{=Control (no manure)} & \text{=20 lb./ac. of N as A/S} & \text{=40 lb./ac. of N as A/S} & \text{=20 lb./ac. of N as A/N} & \text{=40 lb./ac. of N as A/N}
\end{array}
\]

3. DESIGN:
   Same as in exp. no. 54(SFT) type I on page 75.

4. GENERAL:
   (i) Normal. Partial lodging. (ii) Incidence of rust in about 15% of the experimental fields and in few cases there was slight damage by rats. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) N.A. (v) No. (vi) and (vii) Nil.

5. RESULTS:

\[
\begin{array}{c|c|c|c|c|c}
\text{Treatment} & 0 & N_1 & N_2 & N_1' & N_2' \\
\hline
\text{Av. yield} & 1774 & 2065 & 2121 & 2081 & 2170 \\
\text{G.M.} & -2042 \text{lb./ac.} ; & \text{S.E./mean} & =35.3 \text{lb./ac. and no. of trials} & =31.
\end{array}
\]

Crop: Wheat (Rabi).  
Site: Mahasana.

Object: Type II—To study the effect of different levels and types of N and P on Wheat.
1. **Basal Conditions:**
   (i) (a) to (c) N.A. (ii) Alluvial—Sandy loam—pH 8.1. (iii) to (v) N.A. (vi) mid. of October. (vii) Irrigated. (viii) and (ix) N.A. (x) mid. of March.

2. **Treatments:**
   0 = Control (no manure)  
   $P_1 = 20$ lb./ac. of $P_2$ as Super  
   $P_1N_1 = 20$ lb./ac. of $P_2$ as Super + 20 lb./ac. of $N$ as A/S  
   $P_1N_2 = 20$ lb./ac. of $P_2$ as Super + 40 lb./ac. of $N$ as A/S  
   $P_1N_1' = 20$ lb./ac. of $P_2$ as Super + 20 lb./ac. of $N$ as A/N  
   $P_1N_2' = 20$ lb./ac. of $P_2$ as Super + 40 lb./ac. of $N$ as A/N

3. **Design:**
   Same as in exp. no. 54(SFT) type I on page 75.

4. **General:**
   (i) Normal. (ii) Black rust attack. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

5. **Results:**
   Treatment  
   Av. yield  
   $P_1$  
   $P_1N_1$  
   $P_1N_2$  
   $P_1N_1'$  
   $P_1N_2'$  
   G.M. = 1755 lb./ac.; S.E./mean = 61.7 lb./ac. and no. of trials = 27.

---

**Crop:** Wheat  
**Site:** Mahasana  
**Ref:** Gj. 55(SFT)  
**Type:** 'M'.

Object:—Type II—To study the effect of different levels of $N$ and types of $N$ and $P$ on Wheat.

1. **Basal Conditions:** and 2. **Treatments:**
   Same as in exp. no. 54(SFT) type II on page 76.

3. **Design:**
   Same as in exp. no. 54(SFT) type I on page 75.

4. **General:**
   (i) Normal. Partial lodging. (ii) Incidence of rust in about 15% of the experimental fields and in few cases there was slight damage by rats. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) N.A. (v) No. (vi) and (vii) Nil.

5. **Results:**
   Treatment  
   Av. yield  
   $P_1$  
   $P_1N_1$  
   $P_1N_2$  
   $P_1N_1'$  
   $P_1N_2'$  
   G.M. = 210 lb./ac.; S.E./mean = 38.3 lb./ac. and no. of trials = 33.

---

**Crop:** Wheat (Rabi).  
**Site:** Mahasana  
**Ref:** Gj. 54(SFT).  
**Type:** 'M'.

Object:—Type IV—To study the effect of $N$, $P$ and $K$ on Wheat.

1. **Basal Conditions:**
   (i) (a) to (c) N.A. (ii) Alluvial—Sandy loam—pH 8.1. (iii) to (v) N.A. (vi) mid. of October. (vii) Irrigated. (viii) and (ix) N.A. (x) mid. of March.
2. **TREATMENTS**:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1549</td>
<td>1903</td>
<td>1920</td>
<td>1977</td>
<td>1879</td>
<td>1914</td>
</tr>
</tbody>
</table>

G.M. = 1857 lb./ac.; S.E. = 46.9 lb./ac. and no. of trials = 27.

3. **DESIGN**:
Same as in exp. no. 51; type 1 on page 75.

4. **GENERAL**:
(i) Normal; (ii) Black rust attack. (iii) Grain yield. (iv) 1954—1955. (b) No. (c) N.A. (v) No. (vi) and (vii) Nil.

5. **RESULTS**:

**Crop:** Wheat *(Rabi).*  
**Site:** Mahasana.

Object: To study the effect of N, P, and K on Wheat.

1. **BASAL CONDITIONS** and 2. **TREATMENTS**.
Same as in exp. no. 54 (SFT) type IV on page 77.

3. **DESIGN**:
Same as the exp. no. 54 (SFT), type I on page 75.

4. **GENERAL**:
(i) Normal; Partial lodging. (ii) Incidence of rust in about 15% of the experimental fields and in few cases there was slight damage by rats. (iii) Grain yield. (iv) 1954—1955. (b) No. (c) N.A. (v) No. (vi) and (vii) Nil.

5. **RESULTS**:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1775</td>
<td>1986</td>
<td>2114</td>
<td>2218</td>
<td>2168</td>
<td>2204</td>
</tr>
</tbody>
</table>

G.M. = 2078 lb./ac.; S.E. = 43.7 lb./ac. and no. of trials = 31.

---

**Crop:** Wheat *(Rabi).*  
**Site:** Manavadav.

Object: To study the effect of different doses and sources of N on Wheat.

1. **BASAL CONDITIONS**:
(i) (a) to (c) N.A. (ii) Medium brown—clayey soil—pH 8.3. (iii) to (v) N.A. (vi) Mid. of October. (vii) Irrigated. (viii) and (ix) N.A. (x) March.

2. **TREATMENTS**:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1775</td>
<td>1986</td>
<td>2114</td>
<td>2218</td>
<td>2168</td>
<td>2204</td>
</tr>
</tbody>
</table>

G.M. = 2078 lb./ac.; S.E. = 43.7 lb./ac. and no. of trials = 31.

---

**Crop:** Wheat *(Rabi).*  
**Site:** Manavadav.

Object: To study the effect of different doses and sources of N on Wheat.

1. **BASAL CONDITIONS**:
(i) (a) to (c) N.A. (ii) Medium brown—clayey soil—pH 8.3. (iii) to (v) N.A. (vi) Mid. of October. (vii) Irrigated. (viii) and (ix) N.A. (x) March.

2. **TREATMENTS**:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1775</td>
<td>1986</td>
<td>2114</td>
<td>2218</td>
<td>2168</td>
<td>2204</td>
</tr>
</tbody>
</table>

G.M. = 2078 lb./ac.; S.E. = 43.7 lb./ac. and no. of trials = 31.
3. DESIGN:
Same as in expt. no. 54 (SFT) type I on page 75.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield data. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N₁</th>
<th>N₂</th>
<th>N₁'</th>
<th>N₂'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1312</td>
<td>1488</td>
<td>1628</td>
<td>1720</td>
<td>1789</td>
</tr>
</tbody>
</table>

G.M. = 1587 lb./ac. S.E./mean = 51.0 lb./ac. and no. of trials = 29.

---

_Crop_ :- Wheat (Rabi).
_Site_ :- Manavadav.
_Object_ :- Type I—To study the effect of different doses and types of N on Wheat.

1. BASAL CONDITIONS:
Same as in expt. no. 54 (SFT) type I on page 75.

2. TREATMENTS:
0 = Control
N₁ = 20 lb./ac. of N as A/S
N₂ = 40 lb./ac. of N as A/S
N₁' = 20 lb./ac. of N as A/N.
N₂' = 40 lb./ac. of N as A/N.

3. DESIGN: and 4. GENERAL:
Same as in expt. no. 54 (SFT) type I on page 75.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N₁</th>
<th>N₂</th>
<th>N₁'</th>
<th>N₂'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1199</td>
<td>1447</td>
<td>1709</td>
<td>1949</td>
<td>2205</td>
</tr>
</tbody>
</table>

G.M. = 1702 lb./ac. S.E./mean = 76.3 lb./ac. and no. of trials = 29.

---

_Crop_ :- Wheat (Rabi).
_Site_ :- Manavadav.
_Object_ :- Type II—To study the effect of different levels and types of N and P on Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Medium black—clayey loam, p.H. 8.3. (iii) to (v) N.A. (vi) Mid. of October.
(vii) Irrigated. (viii) and (ix) N.A. (x) March.

2. TREATMENTS:
0 = Control.
P₁₁ = 20 lb./ac. of P₂O₅ as Super
P₁₁N₁ = 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of N as A/S
P₁₁N₂ = 20 lb./ac. of P₂O₅ as Super + 40 lb./ac. of N as A/S
P₁₁N₁' = 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of N as Urea.
P₁₁N₂' = 20 lb./ac. of P₂O₅ as Super + 40 lb./ac. of N as Urea.

3. DESIGN:
Same as in expt. no. 54 (SFT) type I on page 75.
4. GENERAL
(i) Normal. (ii) Nil. (iii) Yield data. (iv) (a) 1953—55. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>P₁</th>
<th>P₁N₁</th>
<th>P₁N₂</th>
<th>P₁N₃</th>
<th>P₁N₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1289</td>
<td>1568</td>
<td>1723</td>
<td>2002</td>
<td>2099</td>
<td>2283</td>
</tr>
</tbody>
</table>

G.M. =1827 lb./ac.; S.E./mean =79.0 lb./ac. and no. of trials =29.

**RESULTS:**

**Crop:** Wheat (*Rabi*).  
**Site:** Manavadav.  
**Ref:** Gj. 55 (SFT).  
**Type:** ‘M’.

Object:—Type II—To study the effect of different levels and types of N and P on Wheat.

1. BASAL CONDITIONS:
   Same as in exp. no. 54 (SFT) type II on page 76.

2. TREATMENTS:
   0 = Control.
   P₁ = 20 lb./ac. of P₂O₅ as Super.
   P₁N₁ = 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of N as A/S.
   P₁N₂ = 20 lb./ac. of P₂O₅ as Super + 40 lb./ac. of N as A/S.
   P₁N₃ = 20 lb./ac. of P₂O₅ as Super + 20 lb./ac. of N as A/N.
   P₁N₄ = 20 lb./ac. of P₂O₅ as Super + 40 lb./ac. of N as A/N.

3. DESIGN:
   Same as in exp. no. 54 (SFT) type I on page 75.

4. GENERAL:

5 RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>P₁</th>
<th>P₁N₁</th>
<th>P₁N₂</th>
<th>P₁N₃'</th>
<th>P₁N₄'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1251</td>
<td>1498</td>
<td>1844</td>
<td>2195</td>
<td>2386</td>
<td>2537</td>
</tr>
</tbody>
</table>

G.M. =1952 lb./ac.; S.E./mean =75.4 lb./ac. and no. of trials =29.

**RESULTS:**

**Crop:** Wheat (*Rabi*).  
**Site:** Manavadav.  
**Ref:** Gj. 55 (SFT).  
**Type:** ‘M’.

Object:—Type II—To study the effect of different levels and types of N and P on Wheat.

1. BASAL CONDITIONS:
   Same as in exp. no. 54 (SFT) type II on page 76.

2. TREATMENTS:
   All combinations of (1), (2) and (3) + 3 extra treatments.
   (1) 3 levels of N: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
   (2) 3 sources of N: S₁ = A/S, S₂ = A/S/N and S₃ = Urea.
   (3) 3 levels of P₂O₅ as triple Super: P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.

3 extra treatments:  
E₁ = 60 lb./ac. of N + 40 lb./ac. of P₂O₅.  
E₂ = 40 lb./ac. of N + 80 lb./ac. of P₂O₅ and  
E₃ = 60 lb./ac. of N + 80 lb./ac. of P₂O₅ + N as A/S and P₂O₅ as triple Super.

Nitrogenous fertilizers mixed with soil and broadcast just before sowing and mixed into the soil by running seed drill across the length of plots. P₂O₅ incorporated into the soil 9 days before sowing.
3. DESIGN:
(i) 3r Fact. confd.+3 extra treatments in each block. (ii) 12 plots/block: 3 blocks/replication. 
N.A. (iii) 1. (iv) (a) 29'×18'’. (b) 26'×15'’. (v) 1.5'×1.5’. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Attack of white flies in early stages of the crop, negligible % of top shoot borer and rat damage. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1781 lb./ac. (ii) 314.2 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

\[
\begin{array}{|c|c|c|c|}
\hline
 & N_0 & N_1 & N_2 \\
\hline
P_0 & 1853 & 2006 & 1409 \\
P_1 & 1543 & 1331 & 1818 \\
P_2 & 1750 & 2025 & 2134 \\
Mean & 1715 & 1787 & 1787 \\
\hline
S_1 & 1873 & 1899 & \\
S_2 & 1958 & 1850 & \\
S_3 & 1531 & 1812 & \\
\hline
\end{array}
\]

S.E. of body of any table or any extra treatment =181.4 lb./ac.
S.E. of any marginal mean =104.7 lb./ac.

_Crop_: Wheat (Rabi).
_Site_: Paliyad.
_Ref_: Gj. 55 (SFT).
_Type_: ‘M’.

Object:—Type I (a)—To study the effect of N and P\textsubscript{2}O\textsubscript{5} on Wheat.

1. BASAL CONDITIONS: to 3. DESIGN:
Same as in expt. no. 54 (SFT) type I (a) on page 80.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) N.A. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1977 lb./ac. (ii) 166.2 lb./ac. (iii) N effect alone is highly significant. (iv) Av. yield of grain in lb./ac.

\[
\begin{array}{|c|c|c|c|c|c|c|c|}
\hline
 & N_0 & N_1 & N_2 & N_3 & S_1 & S_2 & S_3 \\
\hline
P_0 & 1749 & 1803 & 2042 & 1865 & 1816 & 1886 & 1892 \\
P_1 & 1539 & 1797 & 2166 & 1834 & 1963 & 1699 & 1840 \\
P_2 & 1758 & 1935 & 2209 & 1967 & 1881 & 1925 & 2095 \\
Mean & 1682 & 1845 & 2139 & 1889 & 1887 & 1837 & 1942 \\
S_1 & 1850 & 2175 & & & & & \\
S_2 & 1729 & 2105 & & & & & \\
S_3 & 1956 & 2136 & & & & & \\
\hline
\end{array}
\]

S.E. of body of any table or any extra treatment =96.0 lb./ac.
S.E. of any marginal mean =55.4 lb./ac.
Crop: Wheat (Rabi).
Site: Paliyad.

Object:—Type II (a)—To study the effect of different sources of N applied at different times on Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Medium deep soil. (iii) Nil. (iv) N.P.-715. (v) (a) N.A. (b) Drilling by 5 coultred drill. (c) 80 lb./ac. (d) 9'. (e) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) March 1955.

2. TREATMENTS:
All combinations of (1) and (2) + a control
(1) 3 sources of 20 lb./ac. of N : S1=A/S, S2=A/S/N and S3=Urea.
(2) 2 times of application of N : T1=at sowing and T2=at first irrigation.
Fertilizers mixed with soil and broadcast.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 51/11'. (b) 48/81'. (v) 1.5'x1.5'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) [a] 1954—1955. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 180 lb./ac. (ii) 132.1 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>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>1715</td>
<td>1908</td>
<td>1715</td>
<td>1779</td>
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<tr>
<td>T2</td>
<td>1826</td>
<td>1935</td>
<td>1831</td>
<td>1864</td>
</tr>
<tr>
<td>Mean</td>
<td>1770</td>
<td>1921</td>
<td>1773</td>
<td>1821</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 52.6 lb./ac.
S.E. of marginal mean of T = 64.4 lb./ac.
S.E. of body of table or control mean = 91.0 lb./ac.

Crop: Wheat (Rabi).
Site: Paliyad.

Object:—Type II (a)—To study the effect of different sources of N applied at different times on Wheat.

1. BASAL CONDITIONS:
Same as in expt. no. 54 (SFT); type II above.

5. RESULTS:
(i) 1066 lb./ac. (ii) 132.9 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>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>1052</td>
<td>1034</td>
<td>1086</td>
<td>1057</td>
</tr>
<tr>
<td>T2</td>
<td>1155</td>
<td>1023</td>
<td>1027</td>
<td>1068</td>
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<tr>
<td>Mean</td>
<td>1103</td>
<td>1028</td>
<td>1056</td>
<td>1062</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of S = 47.0 lb./ac.
S.E. of marginal mean of T = 38.4 lb./ac.
S.E. of body of table or control mean = 66.5 lb./ac.
Crop :- Wheat (Rabi).
Site :- Paliyad.

Object :- Type IV—To study the effect of different doses and sources of \( P_2O_5 \) applied through different methods of application on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (e) N.A. (ii) Medium black soil. (iii) Nil. (iv) N.P.= 715. (v) (a) and (b) Drilling by 5 coulted seed drill. (c) 80 lb./ac. (d) 9". (e) Nil. (vi) N.A. (vii) Irrigated. (viii) (and ix) N.A. (x) March 1955.

2. TREATMENTS:
   All combinations of (1), (2) and (3)+2 control.
   (1) 2 levels of \( P_2O_5 \) : \( P_1=20 \) and \( P_2=40 \) lb./ac.
   (2) 2 sources of \( P_2O_5 \) : \( S_1=\) Triple super and \( S_2=\) Ammo. Phos.
   (3) 3 methods of applications : \( M_1=\) Broadcast before final cultivation, \( M_2=\) Band placement and \( M_3=\) 7" below the seeds.

N was equalised by broadcasting A/S to make up 30 lb./ac. of N.

3. DESIGN:
   (i) and (ii) R.B.D. in 3 replications with 14 plots/replication. (iii) (a) 36' x 15'. (iv) 33' x 12'. (iv) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) N.A. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1637 lb./ac. (ii) 507.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

\[
\begin{array}{cccccc}
& M_1 & M_2 & M_3 & \text{Mean} & S_1 & S_2 \\
P_1 & 1771 & 1639 & 1491 & 1634 & 1609 & 1659 \\
P_2 & 1709 & 1858 & 1385 & 1651 & 1457 & 1844 \\
\text{Mean} & 1740 & 1748 & 1438 & 1642 & 1533 & 1751 \\
S_1 & 1522 & 1801 & 1277 & & & \\
S_2 & 1959 & 1696 & 1599 & & & \\
\end{array}
\]

S.E. of marginal mean of \( M \) = 146.5 lb./ac.
S.E. of marginal mean of \( P \) or \( S \) = 119.6 lb./ac.
S.E. of body of \( P \times M \) or \( S \times M \) tables or of control mean = 207.2 lb./ac.
S.E. of body of \( P \times S \) table = 169.2 lb./ac.

---

Crop :- Wheat (Rabi).
Site :- Paliyad.

Object :- Type IV—To study the effect of different doses and sources of \( P_2O_5 \) applied through different methods of application on Wheat.

1. BASAL CONDITIONS:
   Same as in expt. no. 54(SFT) type IV as above.

5. RESULTS:
   (i) 1865 lb./ac. (ii) 370.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.
Crop :- Wheat (Rabi).
Site :- Paliyad.
Ref :- Gj. 54(SFT).
Type :- 'M'.

Object :- Type VI—To study the residual effect of phosphate applied in different doses on Wheat.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) Medium black soil.  (iii) 1.25 lb./plot of A/S applied to all treatments except treatment No. 1.  (vi) N.P.-715.  (v) (a) N.A.  (b) Drilling with 5 coultured seed drill.  (c) to (e) N.A.  (vi) N.A.  (vii) Irrigated.  (viii) and (ix) N.A.  (x) Mid March.

2. TREATMENTS :
   Year  1  2  3  4  5  6  7  8  9  10  11  12
   1  0  0  0  0  0  0  1  2  0  0  0  0  0  1  2
   2  0  0  0  0  0  1  2  0  0  0  1  4  1  2
   3  0  0  0  0  0  0  0  0  1  2  1  2
   4  0  0  0  0  1  2  0  0  0  0  0  1  2

   Unit dressing of 20 lb./ac. of P2O5 applied as above and residual effect of phosphate subsequently studied.

3. DESIGN :
   (i) R.B.D.  (ii) [a] 12.  (b) N.A.  (iii) N.A.  (iv) (a) 36'×15'.  (b) 33'×12'.  (v) N.A.  (iv) Yes.

4. GENERAL :
   (i) Good.  (ii) N.A.  (iii) Grain yield.  (iv) N.A.  (v) to (vii) Nil.

5. RESULTS :
   (i) 2488 lb./ac.  (ii) 185.7 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb./ac.

   Treatment  1 (A)  10 (B)  4,11 (C)  5,12 (D)  2,36 to 9 (E)
   Av. yield  2487  2676  2450  2645  2418

   S.E./mean for A or B = 131.3 lb./ac.  S.E./mean for C or D = 92.9 lb./ac.  S.E./mean (E) = 53.6 lb./ac.
5. RESULTS:
(i) 2200 lb./ac.  (ii) 324.4 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain 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>
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<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
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<tr>
<td>Av. yield</td>
<td>1920</td>
<td>2219</td>
<td>2219</td>
<td>1909</td>
<td>2238</td>
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<td>2476</td>
<td>2219</td>
<td>2219</td>
<td>2334</td>
<td>2364</td>
<td>2187</td>
</tr>
</tbody>
</table>

S.E. of mean of treatments other than (2,3,8,9) = 229.3 lb./ac.
S.E. of mean of 2,3, 8 and 9 = 114.7 lb./ac.

Crop :- Wheat (Rabi).
Site :- Paliyad.

Object :- Type IX—To study the effect of N, P and F.Y.M. applied singly and in combination on Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) Sandy to clay loam.  (iii) N.A.  (iv) N.P.-715.  (v) (a) Ploughing and harrowing. Seed covered by running a long blade harrow.  (b) 5 coultured seed drill.  (c) 80 lb./ac.  (d) 9°.  (e) —.  (vi) N.A.  (vii) Irrigated.  (viii) and (ix) N.A.  (x) End of March 1955.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S: N0 = 0, N1 = 20 and N2 = 40 lb./ac.
(2) 3 levels of P2O5 as Super: P0 = 0, P1 = 20 and P2 = 40 lb./ac.
(3) 3 levels of F.Y.M.: F0 = 0, F1 = 10 and F2 = 20 C.L./ac.
F.Y.M. broadcast on 2.11.1954, Super ploughed in while A/S was broadcast immediately before sowing of wheat.

3. DESIGN:
(i) and (ii) 3 confd.  (iii) 1 repln.  (iv) (a) 24'X22'.  (b) 21'X19'.  (v) N.A.  (vi) Yes.

4. GENERAL
(i) to (vii) N.A.

5. RESULTS:
(i) 1936 lb./ac.  (ii) 134.7 lb./ac.  (iii) Only N effect is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>Mean</th>
<th>F0</th>
<th>F1</th>
<th>F2</th>
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<td>1840</td>
<td>1793</td>
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<td>1988</td>
<td>2040</td>
<td>1993</td>
<td>2035</td>
<td>1920</td>
<td>2024</td>
</tr>
<tr>
<td>N2</td>
<td>1932</td>
<td>2114</td>
<td>2024</td>
<td>2023</td>
<td>1892</td>
<td>2035</td>
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<tr>
<td>Mean</td>
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<td>1957</td>
<td>1968</td>
<td>1936</td>
<td>1890</td>
<td>1915</td>
<td>2004</td>
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<table>
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<tr>
<th></th>
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<th>F2</th>
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<tbody>
<tr>
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<tr>
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<td>1967</td>
</tr>
<tr>
<td>F2</td>
<td>1972</td>
<td>2046</td>
<td>1995</td>
</tr>
</tbody>
</table>

S.E. of any, marginal mean = 44.9 lb./ac.
S.E. of body of any table = 77.8 lb./ac.

Crop :- Wheat (Rabi).
Site :- Paliyad.

Ref :- Gj. 54(SFT).
Type :- 'M'.
1. BASAL CONDITIONS to 4. GENERAL:
   Same as in expt. no. 54(SFT) type IX on page 85.

5. RESULTS:
   (i) 1345 lb./ac.  (ii) 156.6 lb./ac.  (iii) Only P and F effects are 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>
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<tr>
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<td>1347</td>
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<td>1467</td>
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<tr>
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</tr>
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<td>1613</td>
<td>1500</td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 52.2 lb./ac.
S.E. of body of any table = 90.4 lb./ac.

---

Crop :- Wheat.
Site :- Agri. Res. Stn., Kholwad.
Ref :- Gj. 59(69).
Type :- 'MV'.

Object :- To find out suitable doses of manures for different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Cotton in 1958-59; and Sann in kharif 1959-60.  (c) N.A.  (ii) (a) Medium black.  (b) N.A.  (iii) 17.11.1959 and 25.11.1959.  (iv) (a) 1 ploughing and 4 harrowings.  (b) Dibbling.  (c) N.A.  (d) 12"×4".  (e) 4 seeds/dibble.  (v) 5 C.L./ac. of F.Y.M. broadcast on 9.6.1959.  (vi) As per treatments.  (vii) Irrigated.  (viii) 2 interculturings.  (ix) 106.5” (June to Oct. 1959).  (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of N : N₀=0, N₁=30 and N₂=60 lb./ac.
   (2) 2 levels of P₂O₅ : P₀=0 and P₁=20 lb./ac.
   Sub-plot treatments:
   4 varieties ; V₁=N.P.-718, V₂=Hy 65, V₃=N-345 and V₄=N-917.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 6 main-plots/block; 4 sub-plots/main-plot.  (b) N.A.  (iii) 2.  (iv) (a) 21’×36’.  (b) 15’×30’.  (v) 3’×3’.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1959—contd.  (b) N.A.  (c) No.  (v) ’a’ and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1176 lb./ac.  (ii) (a) 279.8 lb./ac.  (b) 114.2 lb./ac.  (iii) Main effect of N alone is significant. Other effects and interactions are not significant.  (iv) Av. yield of grain in lb./ac.
Crop :- Wheat (*Rabi*).

Site :- Paliyad.

Object :- Type VIII—To study the effect of N and P<sub>2</sub>O<sub>5</sub> on different varieties of Wheat.

1. BASAL CONDITIONS:

   (i) (a) to (c) N.A. (ii) Medium black soils of trap and gneissic origin. (iii) N.A. (iv) As per treatments. 
   (v) (a) N.A. (b) Drilled by 5 coulted seed drill. (c) 80 lb./ac. for V<sub>1</sub> and V<sub>a</sub> and 100 lb./ac. for V<sub>2</sub>. 

2. TREATMENTS:

   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A/S: 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> as triple super: P<sub>0</sub>=0, P<sub>1</sub>=20 and P<sub>2</sub>=40 lb./ac.
   (3) 3 varieties: V<sub>1</sub>=White katha, V<sub>2</sub>=Kenphad and V<sub>a</sub>=N.P.-715.

   Triple Super incorporated into the soil 6 days before sowing and A/S broadcasted just before sowing.

3. DESIGN:

   (i) 3<sup>3</sup> Fact. confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) I. (iv) (a) 36’×15’.
   (b) 33’×12’. (v) N.A. (vi) Yes.

4. GENERAL:

   (i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

   (i) 1874 lb./ac. (ii) 182.5 lb./ac. (iii) Only N effect is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V&lt;sub&gt;1&lt;/sub&gt;</th>
<th>V&lt;sub&gt;2&lt;/sub&gt;</th>
<th>V&lt;sub&gt;3&lt;/sub&gt;</th>
<th>Mean</th>
<th>P&lt;sub&gt;0&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
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<td>1186</td>
<td>1325</td>
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<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. N marginal means = 98.9 lb./ac.
2. P marginal means = 80.8 lb./ac.
3. V marginal means = 46.6 lb./ac.
4. V means at the same level of N = 80.8 lb./ac.
5. V means at the same level of P = 65.9 lb./ac.
6. N means at the same level of V = 121.1 lb./ac.
7. P means at the same level of V = 98.9 lb./ac.
S.E. of body of N×P table = 139.9 lb./ac.
Crop: Wheat (Rabi).
Site: Paliyad.

Ref: Gj. 55(SFT).
Type: 'MV'.

Object: Type VIII—To study the effect of N and P₂O₅ on different varieties of Wheat.

1. BASAL CONDITIONS to 4. GENERAL:
   Same as in expt. no. 54(SFT) on page 87.

5. RESULTS:
   (i) 1398 lb./ac.
   (ii) 194.7 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>V₁</th>
<th>V₂</th>
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<td>1604</td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 60.8 lb./ac.
S.E. of body of any table = 105.4 lb./ac.

---

Crop: Wheat. (Rabi).

Ref: Gj. 54(11).
Type: 'C'.

Object:—To study the economic seed rate for irrigated Wheat.

1. BASAL CONDITIONS:

2. TREATMENTS:
   5 seed rates:—R₁=40, R₂=60, R₃=80, R₄=100 and R₅=120 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) 5. (iii) 5. (iv) (a) 26' x 13.5'. (b) 21' x 9.75'. (v) 5 rows on either side of the block and one row on either side of each plot. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1662 lb./ac. (ii) 155.3 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.
Crop :- Wheat (Rabi).


Object :-To find out the optimum date of sowing for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Shallow, light black. (b) Refer soil analysis, Amreli. (iii) As per treatments. (iv) (a) One harrowing. (b) Drilling. (c) 80 lb./ac. (d) 9" between rows. (e). (v) K.C.N.-133. (vi) Irrigated. (vii) Two interculturings. (ix) 1.13". (x) 2, 8 and 16.3.1959.

2. TREATMENTS:

3. DESIGN :
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 80'x10.25'. (b) 77'x8.25'. (v) 1.5'x1'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) No reason given for high yields.

5. RESULTS:
   (i) 2265 lb./ac. (ii) 123.4 lb./ac. (iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.
Crop :- Wheat (*Rabi*).

Object :- To study the residual effect of mixed cropping in *Kharif* on the yield of succeeding Wheat crop.

1. BASAL CONDITIONS :
   (i) (a) *Bajri* and Groundnut—Wheat. (b) *Bajri* and Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 2.11.1957. (iv) (a) One ploughing and three harrowings. (b) Drilling. (c) 60 lb./ac. (d) Between rows—9'. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 27.42'. (x) 9 and 10.3.1958.

2. TREATMENTS :
   1. Separate rows of *Bajri* and Groundnut in 1 : 1 proportion.
   2. Separate rows of *Bajri* and Groundnut in 1 : 2 proportion.
   3. Separate rows of *Bajri* and Groundnut in 1 : 3 proportion.
   4. *Bajri* alone
   5. Groundnut alone

   Treatments applied in *Kharif* 1957-58.

3. DESIGN :
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 94' x 21'. (b) 90' x 18'. (v) 2' x 1.5'. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 803 lb./ac. (ii) 79.54 lb./ac. (iii) Treatments differ significantly. (iv) Av yield of grain in lb./ac.
   Treatment  1  2  3  4  5
   Av. yield    794  743  777  769  931
   S.E./mean   = 39.66 lb./ac.
5. RESULTS:
(i) 1140 lb./ac.  (ii) 80.80 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>960</td>
<td>1093</td>
<td>1151</td>
<td>993</td>
<td>1504</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40.40</td>
</tr>
</tbody>
</table>

**Crop:** Wheat (Rabi).  **Ref:** Gj. 59(92).  **Type:** 'C'.

**Site:** Agri. Res. Stn., Amreli.

Object:—To find out the residual effect of mixed cropping in *Kherif* on yield of succeeding Wheat crop.

1. BASAL CONDITIONS:
(i) (a) and (b) As per treatments.  (c) N.A.  (ii) (a) Shallow, light black.  (b) Refer soil analysis, Amreli.  (iii) 25.11.1959.  (iv) (a) One ploughing, two harrowings.  (b) Drilling.  (c) 60 lb./ac.  (d) 9° between rows.  (e)—.  (v) 5 C.L./ac. of F.Y.M.  (vi) K.C.N.—133.  (vii) Irrigated.  (viii) Three to four interculturings and two weedings.  (ix) 12.99.  (x) 14.3.1960.

2. TREATMENTS:
Same as in expt. no. 57 (5) on page 90.

3. DESIGN:
(i) R.B.D.  (ii) (a) 5.  (b) N.A.  (iii) 4.  (iv) (a) 92'x21'.  (b) 90'x15'.  (v) 1'x3'.  (vi) Yes.

4. GENERAL:
(i) Normal.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1950—1955.  (b) Yes.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 859 lb./ac.  (ii) 65.37 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>788</td>
<td>854</td>
<td>943</td>
<td>699</td>
<td>1010</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>32.69</td>
</tr>
</tbody>
</table>

**Crop:** Wheat.  **Ref:** Gj. 54(5).  **Type:** 'C'.

**Site:** Agri. Res. Stn., Arnej.

Object:—To find out the best preparatory tillage for Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Gram—Wheat.  (b) Gram.  (c) Nil.  (ii) (a) Medium to deep black.  (b) Refer soil analysis, Arnej.  (iii) 25.10.1954.  (iv) (a) and (b) N.A.  (c) 40 lb./ac.  (d) Between rows—12°.  (e) N.A.  (v) Nil.  (vi) A—206 (medium).  (vii) Unirrigated.  (viii) Weeding.  (ix) 24.10°.  (x) 6.3.1955.

2. TREATMENTS:
All combinations of (1) and (2)
(1) No. of harrowings : H1=2, H2=3, H3=4 and H4=5.
(2) Floughings: P0= none and P1=1 ploughing.

3. DESIGN:
(i) Fact. in R.B.D.  (ii) (a) 8.  (b) N.A.  (iii) 4.  (iv) (a) 113'x14'.  (b) 169'x10'.  (v) 2'x2'.  (vi) Yes.

4. GENERAL:
(i) Fair.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1950—1955.  (b) and (c) No. (v) (a) and (b) N.A.  (vi) Cloudy weather affected the yield.  (vii) Nil.
5. RESULTS:
(i) 546 lb/ac. (ii) 81.6 lb/ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>H₁</th>
<th>H₂</th>
<th>H₃</th>
<th>H₄</th>
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<tbody>
<tr>
<td>P₁</td>
<td>441</td>
<td>523</td>
<td>623</td>
<td>574</td>
<td>540</td>
</tr>
<tr>
<td>P₁</td>
<td>593</td>
<td>570</td>
<td>513</td>
<td>530</td>
<td>552</td>
</tr>
<tr>
<td>Mean</td>
<td>517</td>
<td>546</td>
<td>568</td>
<td>552</td>
<td>546</td>
</tr>
</tbody>
</table>

S.E. of H marginal mean = 28.8 lb/ac.
S.E. of P marginal mean = 20.4 lb/ac.
S.E. of body of table = 40.8 lb/ac.

_Crop :- Wheat._
_Site :- Agri. Res. Stn., Arnej._

Object :- To find out the best preparatory tillage for Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Gram—Wheat. (b) Gram. (c) Nil. (ii) (a) Medium to deep black. (b) Refer soil analysis, Arnej.
(iii) 28.10.1955. (iv) (a) N.A. (b) Drilled. (c) 40 lb/ac. (d) Between rows—12'. (e) N.A. (v) Nil.

2. TREATMENTS:
Same as in exp. no. 54(3) on page 91.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 8. (b) 113’X112’. (iii) 4. (iv) (a) 113’X14’. (b) 109’X10’. (v) 2’X2’.
(vi) Yes.

4. GENERAL:
(i) Due to continuous rain in the first fortnight of September no adequate tillage operation were carried out, which affected the growth of the crop. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1955. (b) and (c) No. (v) a: No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 410 lb/ac. (ii) 81.2 lb/ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>H₁</th>
<th>H₂</th>
<th>H₃</th>
<th>H₄</th>
<th>Mean</th>
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<tbody>
<tr>
<td>P₁</td>
<td>371</td>
<td>433</td>
<td>399</td>
<td>445</td>
<td>412</td>
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<td>P₁</td>
<td>388</td>
<td>391</td>
<td>391</td>
<td>457</td>
<td>407</td>
</tr>
<tr>
<td>Mean</td>
<td>380</td>
<td>412</td>
<td>395</td>
<td>451</td>
<td>401</td>
</tr>
</tbody>
</table>

S.E. of H marginal mean = 28.7 lb/ac.
S.E. of P marginal mean = 20.3 lb/ac.
S.E. of body of table = 40.6 lb/ac.

_Crop :- Wheat._
_Site :- Agri. Res. Stn., Arnej._

Object :- To find out suitable spacing and economic seed rate for Wheat.

Ref :- Gj. 55(1). Type :- 'C'.

Ref :- Gj. 54(2). Type :- 'C'.
1. BASAL CONDITIONS:
   (i) (a) Jowar—Wheat. (b) Jowar for fodder. (c) Nil. (ii) (a) Medium to deep black. (b) Refer soil analysis, Arnej. (iii) 24.10.1954. (iv) (a) Four harrowings. (b) Drilled. (c) to (e) N.A. (v) Nil. (vi) A=206 (medium). (vii) Unirrigated. (viii) Nil. (ix) 24.10. 1955.

2. TREATMENTS:
   Main-plot treatments:
   - 3 seed rates: R1 = 30, R2 = 40 and R3 = 50 lb./ac.
   Sub-plot treatments:
   - 2 spacings between rows: S1 = 9" and S2 = 12".

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) Main-plot: 84'×63'; sub-plot: 21'×42'. (b) 15'×36'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952-1955. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 283 lb./ac. (ii) (a) 71.80 lb./ac. (b) 47.59 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>260</td>
<td>251</td>
<td>337</td>
<td>283</td>
</tr>
<tr>
<td>S2</td>
<td>278</td>
<td>260</td>
<td>312</td>
<td>283</td>
</tr>
<tr>
<td>Mean</td>
<td>269</td>
<td>256</td>
<td>324</td>
<td>283</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. R marginal means = 29.31 lb./ac.
2. S marginal means = 15.86 lb./ac.
3. S means at the same level of R = 27.48 lb./ac.
4. R means at the same level of S = 35.17 lb./ac.

Crop :- Wheat.
Object :- To find out whether drilling is superior to broadcasting of seeds.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis, Bhachau. (iii) 3.11.1955. (iv) (a) N.A. (b) As per treatments. (c) N.A. (d) As per treatments. (e) No. (v) N.A. (vi) N.P.—718 (medium). (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   3 methods of sowing : S1= Broadcasting, S2= Drilling at 9’ spacing and S3= Drilling at 18’ spacing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 53’×33’. (b) 50’×30’. (v) 1.5’×1.5’. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1955—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1238 lb./ac. (ii) 169.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
Crop :- Wheat.

Object :- To find out whether drilling or broadcasting of seed for Wheat crop.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis, Bhachau. (iii) N.A. (iv) (a) N.A. (b) As per treatments. (c) N.A. (d) As per treatments. (e) —. (v) N.A. (vi) N.P.—718 (medium). (vii) Irrigated. (viii) to x; N.A.

2. TREATMENTS :
Same as in expt. no. 55(107) on page 93.

3. DESIGN :
(i) R.B.D. (ii) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 45'x27'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) and (ii), N.A. (iii) Grain yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 1149 lb./ac. (ii) N.A. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1288</td>
<td>1118</td>
<td>1100</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Crop :- Wheat.

Object :- To find out suitable spacing and seedrate for Wheat.

1. BASAL CONDITIONS :
(i) (a) Fallow—wheat—cotton—wheat. (b) Cotton. (c) 8 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) N.A. (iii) 21.10.1954. (iv) (a) N.A. (b) Drilling. (c) As per treatments. (d) Between rows—As per treatments. Between plants—irregular. (e) N.A. (v) 7 C.L./ac. of F.Y.M. broadcast on 1 and 2.6.1954. (vi) Kenphad. (vii) Unirrigated. (viii)Nil. (ix) 0.4'. (x) 12.2.1955.

2. TREATMENTS :
Main-plot treatments :
3 spacings between rows : S_1 = 18", S_2 = 24" and S_3 = 27".
Sub-plot treatments :
3 seed rates : R_1 = 30, R_2 = 40 and R_3 = 50 lb./ac.

3. DESIGN :
(i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) a) 39'x27', 40'x27' and 40.5'x27' for 18", 24" and 27" spacings respectively. (b) 36'x21'. (v) One row on either side and 3' at each end. (vi) Yes.
4. GENERAL:
(i) Not uniform. (ii) Stem borers affected the crop to a little extent. (iii) Grain and chaff yield. (iv) (a) 1952—1955. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 467 lb./ac. (ii) (a) 198.9 lb./ac. (b) 71.0 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>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>400</td>
<td>560</td>
<td>490</td>
<td>483</td>
</tr>
<tr>
<td>R2</td>
<td>436</td>
<td>479</td>
<td>387</td>
<td>434</td>
</tr>
<tr>
<td>R3</td>
<td>442</td>
<td>562</td>
<td>449</td>
<td>484</td>
</tr>
</tbody>
</table>

Mean 467

S.E. of difference of two
1. S marginal means = 66.3 lb./ac.
2. R marginal means = 23.7 lb./ac.
3. R means at the same level of S = 40.9 lb./ac.
4. S means at the same level of R = 74.3 lb./ac.

Crop: Wheat.
Object: To find out suitable spacing and seedrate for wheat.

Ref: Gj. 55(9).
Type: 'C'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 21.10.1955. (iv) (a) Four harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) K—25. (vii) Un-irrigated. (viii) 2 interculturings. (ix) 31.65°. (x) 26.2.1956.

2. TREATMENTS:
Same as in expt. no. 54(19) on page 94.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 36'×21'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1952-1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) No cause has been given for the low yield.

5. RESULTS:
(i) 55 lb./ac. (ii) (a) 34.74 lb./ac. (b) 20.11 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>
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<td>84</td>
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<tr>
<td>R3</td>
<td>58</td>
<td>60</td>
<td>28</td>
<td>49</td>
</tr>
</tbody>
</table>

Mean 55
Object: To compare different tillage operations for Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) *Rajra*. (c) 20 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 16.11.1958. (iv) (a) As per treatments. (b) Drilling. (c) 60 lb./ac. (d) 9" between rows. (e) --. (v) 200 lb./ac. of A/S+200 lb./ac. of manure mixture+100 lb./ac. of P2O5 broadcasted on 6.11.1958 and 10 C.L./ac. of F.Y.M. on 2.11.1958. (vi) N.P.—710. (vii) Irrigated. (viii) Three interculturings. (ix) N.A. (x) 12.3.1959.

2. TREATMENTS:
Main-plot treatments:
2 methods of cultivation: \( M_1 = \) no cultivation by drill after soaking dose and before sowing and \( M_2 = \) cultivation by drill after soaking dose and before sowing.

Sub-plot treatments:
5 cultural operations: \( C_1 = \) no operation (control), \( C_2 = \) one ploughing with mould board plough, \( C_3 = \) one ploughing with local plough, \( C_4 = \) two ploughings with local plough and \( C_5 = \) one harrowing.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 40' × 14'. (b) 34' × 9'. (c) 3' × 2.5'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain and *kachro* yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(ii) (a) 176.4 lb./ac. (b) 112.8 lb./ac. (iii) Only C effect is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( C_2 )</th>
<th>( C_1 )</th>
<th>( C_2 )</th>
<th>( C_3 )</th>
<th>( C_4 )</th>
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<td>690</td>
<td>673</td>
<td>780</td>
<td>593</td>
<td>647</td>
</tr>
<tr>
<td>( M_1 )</td>
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<td>681</td>
<td>709</td>
<td>811</td>
<td>653</td>
<td>695</td>
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<tr>
<td>Mean</td>
<td>562</td>
<td>686</td>
<td>691</td>
<td>796</td>
<td>623</td>
<td>671</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. \( M \) marginal means = 64.4 lb./ac.
2. \( C \) marginal means = 65.1 lb./ac.
3. \( C \) means at the same level of \( M \) = 92.1 lb./ac.
4. \( M \) means at the same level of \( C \) = 104.6 lb./ac.
1. BASAL CONDITIONS:
   (i) (a) Legumes—cereal—cotton. (b) Bajra. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 16.11.1958. (iv) (a) As per treatments. (b) Drilling. (c) 60 lb./ac. (d) 24". (e) —. (v) 200 lb./ac. of A/S±200 lb./ac. of manure mixture +100 lb./ac. of Super. (vi) N.P.—710. (vii) Irrigated. (viii) Three weedings. (ix) About 13". (x) 12.3.1959, 1.4.1959 and 2.4.1959.

2. TREATMENTS:
   1. One ploughing with mould board plough.
   2. One ploughing with local plough.
   3. Two ploughings with local plough.
   4. One harrowing.
   5. Control.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 3. (iv) (a) 40'X14'. (b) 34'X9'. (v) 3'X2.5'. (vi) Yes.

4. GENERAL:
   (i) Moderate. (ii) Light attack of rust. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) Junagadh. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 647.4 lb./ac. (ii) 145.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>690</td>
<td>673</td>
<td>780</td>
<td>593</td>
<td>501</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>≈83.83 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat.

Ref :- Gj. 55(106).
Type :- 'C'.

Object :- To study the effect of interculturings on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Groundnut—wheat—cotton. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 13.11.1955. (iv) (a) Nil. (b) Drilling. (c) 80 lb./ac. (d) 9" between rows. (e) —. (v) Nil. (vi) N.P.—710. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 7.3.1956.

2. TREATMENTS:
   No. of interculture : C₀=0, C₁=1 and C₂=2.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 51'X18'. (b) 45'X12'. (v) 3'X3'. (vi) Yes.

4. GENERAL:
   (i) Below normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 269 lb./ac. (ii) 40.28 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₀</th>
<th>C₁</th>
<th>C₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>281</td>
<td>242</td>
<td>283</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>≈14.24 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop :- Wheat (Rabi).


Object :- To compare different methods of sowing Wheat.

1. BASAL CONDITIONS :
   (i) 'a' Nil. (b) 'B' Sann as G.M. 'c' Nil. (ii) 'a' Medium black. (b) Refer soil analysis, Halvad. (iii) 15.11.1954. (iv) 'a' One ploughing, 2 harrowings and 3 cultivations by drill. (b) As per treatments. (c) 40 lb./ac., 120 lb./ac. and 80 lb./ac. for different methods of sowing. (d) As per treatments. (e) N.A. (f) Nil. (vi) N.P.-710 (medium). (vii) Irrigated. (viii) Two weedings. (ix) Nil. (x) 5.3.1955.

2. TREATMENTS :
   1. Drilling by cultivator's method.
   2. Dibbling at 12" x 4" spacing.
   3. Drilling with 9" spacing between two lines.

3. DESIGN :
   (i) R.B.D. (ii) 'a' 3. (b) N.A. (iii) 6. (iv) (a) 66' x 23'. (b) 60' x 17'. (v) Four rows along length and 3' along breadth. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. No lodging. (ii) Nil. (iii) Height of plant, length of earhead, no. of earheads, no. of spikes, earhead and grain yield. (iv) a N.A. b, and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS :
   (i) 456.6 lb./ac. (ii) 60.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac. Treatment 1 2 3 Av. yield 520.6 374.3 474.9 S.E./mean = 24.34 lb./ac.


<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1806</td>
<td>2064</td>
<td>1906</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 38.54 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).


Ref :- Gj. 56(28).

Type :- 'C'.

Object :- To compare different methods of sowing Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Lucerne. (c) 50 lb./ac. of \( P_2O_5 \). (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 24-11-1956. (iv) (a) One harrowing. (b) As per treatments. (c) 100,80 and 60 lb./ac. for treatments 1, 2 and 3 respectively. (d) 9" between rows. (e) ---. (v) 200 lb./ac. of manure mixture+30 lb./ac. of \( P_2O_5 \)+120 lb./ac. of A/S broadcast. (vi) N.P.—710. (vii) Irrigated. (viii) Nil. (ix) 33.75". (x) 13 to 18-3-1957.

2. TREATMENTS:
   Same as in expt. no. 55 (28) on page 98.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 51'×13'. (b) 45'×6.75'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1468 lb./ac. (ii) 165.6 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1449</td>
<td>1597</td>
<td>1357</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=67.63 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat.


Ref :- Gj. 57(22).

Type :- 'C'.

Object :- To find out whether line sowing is economically advantageous over local method of sowing.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sann as G.M. (c) 200 lb./ac. of single-super. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 6.11.1957. (iv) (a) Ploughings, harrowings and cultivation by drill. (b) to (c) N.A. (v) 200 lb./ac. of single-super before soaking; 200 lb./ac. of manure mixture; 200 lb./ac. of A/S and 200 lb./ac. of castor cake broadcasted before sowing. (vi) N.P.—710 (vii) Irrigated. (viii) Weedings. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. Drilling with hand drill at 6" spacing between two rows.
   2. Drilling with hand drill at 9" spacing between two rows.
   3. Drilling with hand drill at 12" spacing between two rows.
   4. Line sowing by drill at 9" spacing.
   5. Sowing by local method, with 18" distance between rows, by running the drill 3 times in different directions.
3. DESIGN:
   (i) R.B.D. (ii) a. (b) N.A. (iii) 3. (iv) (a) 42'×13'. (b) 36'×61'. (v) 3 rows on each side. (vi) Yes.
4. GENERAL:
   (i) Satisfactory. (ii) No. (iii) Height of plant, no and length of earhead, no. of spikes earhead, grain and fodder yield. (iv) (a) 1955—contd. (b) and (c) No. (v) a, and b, N.A. (vi) and (vii) Nil.
5. RESULTS:
   (i) 1891 lb./ac. (ii) 204.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
   
   Treatment | 1 | 2 | 3 | 4 | 5
   Av. yield | 1867 | 2046 | 1913 | 1762 | 1870
   S.E./mean | =117.9 lb./ac.

Crop :- Wheat.
Object :-To compare different dates of sowing Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sann as G.M. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii)
   As per treatments. (iv) (a) Ploughing, harrowing and cultivation three times after soaking dose. (b)
   Drilling. (c) 80 lb./ac. (d) 9' between two lines. (e) N.A. (f) Nil. (g) N.P.-710. (h) Irrigated.
   (vii) Two interculturings by hand with kodi and one weeding in D3 and D4 plots. (ix) Nil. (x) 6, 16, and
   25.2.1955, 5.3.1955 and 11.3.1955 for treatments D1 to D5 respectively.
2. TREATMENTS:
3. DESIGN:
   (i) R.B.D. (ii) a. (b) N.A. (iii) 4. (iv) (a) 66'×23'. (b) 60'×17'. (v) Four rows along length and 3' along breadth. (vi) Yes.
4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Height of plant and length of earhead in inches, no. of grain/earhead and grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) a and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
   (i) 323.9 lb./ac. (ii) 40.14 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
   
   Treatment | D1 | D2 | D3 | D4 | D5
   Av. yield | 236.9 | 294.2 | 344.3 | 359.7 | 384.5
   S.E./mean | = 20.07 lb./ac.

Crop :- Wheat.
Object :-To compare different dates of sowing Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Groundnut. (c) 18 lb./ac. of N. (ii) (a) Medium black. (b) Refer soil analysis, Halvad.
   (iii) As per treatments. (iv) a. Two harrowings. (b) Drilling. (c) 60 lb./ac. (d) 9' between rows. (e) —.
   (v) 200 lb./ac. of A/S+200 lb. ac. of manure mixture +222 lb./ac. of P2O5; broadcast. (vi) N.P.-710.
   (vii) Irrigated. (viii) Nil. (ix) 13.75'. (x) D1, D2 and D3—21.3.1956; D4 and D5—24.3.1956.
2. **TREATMENTS:**
5 dates of sowing: \(D_1 = 27.10.1955, \quad D_2 = 6.11.1955, \quad D_3 = 16.11.1955, \quad D_4 = 26.11.1955\) and \(D_5 = 6.12.1955\).

3. **DESIGN:**
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 51'×13.5' (b) 360 sq. ft. (Dimensions N.A.) (v) N.A. (vi) Yes.

4. **GENERAL:**
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
(i) 1649 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>(D_1)</th>
<th>(D_2)</th>
<th>(D_3)</th>
<th>(D_4)</th>
<th>(D_5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1497</td>
<td>1887</td>
<td>1856</td>
<td>1474</td>
<td>1530</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td>7.76</td>
<td>7.76</td>
</tr>
</tbody>
</table>

**Crop:** Wheat.  
**Site:** Agri. Res. Stn., Halvad.  
**Ref:** Gj. 56(30).  
**Type:**  'C'.

Object:—To compare different dates of sowing Wheat.

1. **BASAL CONDITIONS:**
(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) As per treatments. (iv) (a) One ploughing and 1 harrowing. (b) Drilling. (c) 60 lb./ac. (d) 9" between rows. (e) —. (v) 125 lb./ac. of manure mixture+100 lb./ac. of A/S broadcasted and 185 lb./ac. of P\(_2\)O\(_5\) drilled. (vi) N.P.—710. (vii) Irrigated. (viii) Nil. (ix) 33.75°. (x) 7.3.1957, 11.3.1957, 15.3.1957 and 26.3.1957 for \(D_1\) to \(D_4\) respectively.

2. **TREATMENTS:**
4 dates of sowing: \(D_1 = 6.11.1956, \quad D_2 = 16.11.1956, \quad D_3 = 26.11.1956\) and \(D_4 = 6.12.1956\).

3. **DESIGN:**
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 51'×13'. (b) 45'×6.75'. (v) N.A. (vi) Yes.

4. **GENERAL:**
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
(i) 1577 lb./ac. (ii) 160.0 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>(D_1)</th>
<th>(D_2)</th>
<th>(D_3)</th>
<th>(D_4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1568</td>
<td>1608</td>
<td>1623</td>
<td>1309</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td>71.54</td>
</tr>
</tbody>
</table>

**Crop:** Wheat.  
**Site:** Agri. Res. Stn., Halvad.  
**Ref:** Gj. 57(34).  
**Type:**  'C'.

Object:—To study the effect of different kharif crops on the yield of succeeding Wheat crop.
1. BASAL CONDITIONS:

(i) 'a' Nil.  b; As per treatments.  (c) 100 lb./ac. of A and S to non-legumes and 100 lb./ac. of single super to legumes.  ii 'a'; Medium black.  b; Refer soil analysis, Halvad.  iii; 9.11.1957.  iv; 'a' Ploughing, harrowing, and cultivation by drill.  b) Drilling.  c) to; N.A.  'v'; 200 lb./ac. of single super before soaking dose.  Broadcasting 200 lb./ac. of A/S and 200 lb./ac. of manure mixture before sowing.  'vi' N.P.—710.  (vii) Irrigated.  (viii) Weedings.  ix' Nil.  'x; N.A.

2. TREATMENTS:

Wheat to be sown after following kharif crops: C0=Fallow, C1=Sann (G.M.), C2=Bajra, C3=Bajra+Til, C4=Til, C5=Guar (G.M.), C6=Bajra+Mug, C7=Mug and C8=Groundnut.

3. DESIGN:

(i) R.B.D.  (ii) 'a' 9.  b; N.A.  (iii) 4.  (iv) (a) 1/77.79 th acre.  (b) 1/142.35 th acre.  'v'; 3 rows on either side.  (vi) Yes.

4. GENERAL:

(i) Satisfactory.  'ii' Nil.  iii Height of plant, no. and length of earheads, no. of spikes/earhead, grain and fodder yield.  iv. 'a' 1956—contd.  (b) and (c) No.  (v) ,a, and (b) N.A.  'vi, and 'vii' Nil.

5. RESULTS:

(i) 1495 lb./ac.  (ii) 146.8 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grains in lb./ac.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ref</td>
<td>Gj. 58(25).</td>
</tr>
<tr>
<td>Type</td>
<td>'C'.</td>
</tr>
</tbody>
</table>

Object :-To study the effect of different kharif crops on the yield of succeeding Wheat crop.

1. BASAL CONDITIONS:

(i) 'a' Legume—cereal—cotton.  b; As per treatments.  (c) Nil.  'ii' (a) Medium black.  (b) Refer soil analysis, Halvad.  (iii) 10.11.1958.  (iv) (a) Two harrowings.  (b) Drilling.  (c) 60 lb./ac.  (d) 9' between rows.  e;—.  'v'; 200 lb./ac. of manure mixture+200 lb./ac. of A/S+100 lb./ac. of Super.  'vi' N.P.—710.  (vii) Irrigated.  (viii) Two weedings.  (ix) About 13'.  'x' 28.2.1959, 9, 10 and 12.3.1959.

2. TREATMENTS:

Wheat to be sown after following kharif crops: C0=Fallow, C1=Sann green, C2=Bajra, C3=Bajra+Til, C4=Til, C5=Guar (G.M.), C6=Bajra+Mug, C7=Mug, C8=Groundnut, C9=Cotton, C10=Cotton+Groundnut and C11=Cotton+Guar.

3. DESIGN:

(i) R.B.D.  (ii) 'a' 12.  b; N.A.  (iii) 4.  (iv) (a) 40'×14'.  (b) 24'×9'.  (v) 3'×2.5'.  (vi); Yes.

4. GENERAL:

(i) Good.  ii Light attack of rust.  iii Grain yield.  (iv) (a) 1956—contd.  (b) No.  (c) Nil.  'v') (a) Julagadh.  b; Nil.  'vi' N.A.  'vii, Data for treatments C9, C10 and C11 is not available.

5. RESULTS:

(i) 1050 lb./ac.  (ii) 245.6 lb. ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1033</td>
<td>1214</td>
<td>986</td>
<td>827</td>
<td>947</td>
<td>1562</td>
<td>836</td>
<td>1040</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C8</th>
<th>C9</th>
<th>C10</th>
<th>C11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1003</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

S.E., mean =122.8 lb./ac.
Crop :- Wheat.


Ref :- Gj. 57(31).

Type :- 'C'.

Object :- To find out the effect of different cultivation practices on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Mud. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 30.10.1957.
   (iv) (a) As per treatments. (b) to (e) N.A. (v) 200 lb./ac. of Super before sowing. Broadcasting of
   200 lb./ac. of A/S and 200 lb./ac. of manure mixture before sowing. (vi) N.P.—710. (vii) Irrigated.
   (viii) Weeding. (ix) Nil. (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   Cultivations: C0 = Nil. and C1 = Cultivation before sowing.

   Sub-plot treatments:
   Ploughings and harrowings: P0 = Control, P1 = One ploughing with mould-board plough, P2 = One
   ploughing with local plough, P3 = Two ploughings with local plough, and P4 = Harrowing.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 5 sub-plots/main plot. (b) N.A. (iii) 4. (iv) (a) 51' x 16'.
   (b) 45' x 9'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Height of plant, no. and length of earheads, no. of spikes/earhead and grain
   yield. (iv) (a) 1957—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1385 lb./ac. (ii) (a) 310.2 lb./ac. (b) 135.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield
   of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C0</td>
<td>1378</td>
<td>1328</td>
<td>1283</td>
<td>1454</td>
<td>1308</td>
<td>1350</td>
</tr>
<tr>
<td>C1</td>
<td>1378</td>
<td>1510</td>
<td>1494</td>
<td>1379</td>
<td>1336</td>
<td>1419</td>
</tr>
<tr>
<td>Mean</td>
<td>1378</td>
<td>1419</td>
<td>1389</td>
<td>1417</td>
<td>1322</td>
<td>1385</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. C marginal means = 98.1 lb./ac.
2. P marginal means = 67.5 lb./ac.
3. P means at the same level of C = 95.5 lb./ac.
4. C means at the same level of P = 130.1 lb./ac.

Crop :- Wheat.

Site :- Agri. Res. Farm, Jamnagar.

Ref :- Gj. 56(116).

Type :- 'C'.

Object :- To study the effect of seed rate and spacing on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 11.11.1956. (iv) (a) N.A. (b) Drilling.
   (c) and (d) As per treatments. (e) —. (v) N.A. (vi) N.P.—798. (vii) and (viii) N.A. (ix) Nil. (x) 14.3.1957.

2. TREATMENTS:
   Main plot treatments:
   2 seed rates: R1 = 75 and R2 = 100 lb./ac.

   Sub-plot treatments:
   3 spacings between rows: S1 = 9', S2 = 18' and S3 = local method (three way sowing).
3. DESIGN:
(i) Split-plot.  (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot.  (b) N.A.  (iii).  (iv) (a) and (b) N.A.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Good.  (ii) N.A.  (iii) Grain yield.  (iv) (a) and (b) N.A.  (c) Nil.  (v) and (vi) Nil.  (vii) Plot size and raw data N.A.

5. RESULTS:
(i) 1729 lb./ac.  (ii) (a) and (b) N.A.  (iii) Interaction R X S 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>R₁</td>
<td>1824</td>
<td>1556</td>
<td>1876</td>
<td>1752</td>
</tr>
<tr>
<td>R₂</td>
<td>1700</td>
<td>1500</td>
<td>1920</td>
<td>1707</td>
</tr>
<tr>
<td>Mean</td>
<td>1762</td>
<td>1528</td>
<td>1898</td>
<td>1729</td>
</tr>
</tbody>
</table>

S.E.'s = N.A.

---

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

**Site :- Agri. Res. Farm, Jamnagar.**

Object :- To study the effect of different spacings on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) 'a' Nil.  (b) and (c) N.A.  (ii) 'a' Medium black.  (b) N.A.  (iii) 25.10.1957.  (iv) (a) N.A.  (b) Drilling and broadcasting.  (c) N.A.  (d) As per treatments.  (c) N.A.  (e) Broadcasting one md. of A/S before sowing and one md. of Super at sowing.  (f) N.P.-798.  (g) Irrigated.  (h) Nil.  (i) Nil.  (k) 18.2.1958.

2. TREATMENTS:
4 spacings between rows : S₁ =9", S₂ =18", S₃ =3"x3" (Chinese method) and S₄ =Criss-cross (local method).

3. DESIGN:
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 1/120 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) N.A.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1956—1958.  (b) and (c) No.  (y) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1070 lb./ac.  (ii) 171.3 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1007</td>
<td>1108</td>
<td>1183</td>
<td>981</td>
</tr>
</tbody>
</table>

S.E.(mean) = 69.95 lb./ac.

---

**Crop :- Wheat.**

**Site :- Agri. Res. Farm, Jamnagar.**

Object:—To study the effect of different spacings on the yield of Wheat.
1. BASAL CONDITIONS:
(a) Nil. (b) and (c) N.A.  
(ii) (a) Medium black. (b) N.A.  
(iii) 3.11.1958. (iv) (a) One harrowing. 
(b) Hand sowing. (c) 80 lb/ac. (d) As per treatments. (e) For treatment S1 only 1 plant/hole. (v) 30 lb/ac. of N. (vi) N.P.—798. (vii) Irrigated. (viii) One weeding. (ix) Nil. (x) 3rd week of Feb. 1959.

2. TREATMENTS:
Same as in exp. no. 57(111) on page 104.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 12’×30’. (b) 9’×27’. (v) 1.5’×1.5’. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—N.A. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1082 lb/ac. (ii) 131.0 lb/ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>956</td>
<td>1063</td>
<td>1122</td>
<td>1188</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>53.51 lb/ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Crop :- Wheat *(Rabi)*.  
Site :- Agri. Res. Farm, Jamnagar.  
Ref :- Gj. 58(89).  
Type :- ‘C’.

Object :- To study the optimum period of sowing for Wheat.

1. BASAL CONDITIONS:
(a) Nil. (b) Lucerne. (c) Nil. (ii) (a) Medium black. (b) N.A. (iii) As per treatments. (iv) (a) One harrowing. (b) Dibbling. (c) 80 lb/ac. (d) 9” between rows. (e) N.A. (v) Nil. (vi) N.P.—798. (vii) Irrigated. (viii) Three weedings. (ix) N.A. (x) N.A.

2. TREATMENTS:

3. DESIGN
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 12’×34’. (b) 9’×30’. (v) 1.5’×2’. (vi) Yes.

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

5. RESULTS:
(i) 1358 lb/ac. (ii) 270.4 lb/ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1106</td>
<td>1357</td>
<td>1514</td>
<td>1518</td>
<td>1202</td>
<td>1420</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>135.2 lb/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Crop :- Wheat.  
Site :- Agri. Res. Farm, Jamnagar.  
Ref :- Gj. 59(22).  
Type :- ‘C’.

Object :- To study the optimum period of sowing for Wheat.
1. BASAL CONDITIONS:
   (i) a Nil, b Bajra, c Nil. (ii) (a) Clay loam with medium black to brown colour. 
   (b) N.A. (iii) As per treatments. (iv) a One ploughing and 1 harrowing. 
   (v) Nil. (vi) 40 lb./ac. of P2O5. (vii) N.P.—798. (viii) Irrigated. (ix) One interculturing and one weeding. 
   (x) 30°. (x) N.A.

2. TREATMENTS:
   Six dates of sowing:—D1=16.10.1959, D2=23.10.1959, D3=30.10.1959, D4=6.11.1959, 
   D5=13.11.1959 and D6=20.11.1959.

3. DESIGN:
   (i) R.B.D. (ii) 6. (b) 72' X 45'. (iii) 4. (iv) (a) 36' X 15'. (b) 30' X 12'. (v) 3' X 1.5'. (vi) Yes.

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

5. RESULTS:
   (i) 1345 lb./ac. (ii) 289.4 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of 
   grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1025</td>
<td>956</td>
<td>1416</td>
<td>1531</td>
<td>1763</td>
<td>1381</td>
</tr>
<tr>
<td>S.E., mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>144.7</td>
</tr>
</tbody>
</table>

   Crop :— Wheat.  
   Site :— Agri. Res. Farm, Jamnagar.  
   Object :—To compare different methods of Wheat cultivation.

Ref :— Gj. 56(114).  
Type :— 'C'.

1. BASAL CONDITIONS:
   (i) a Nil, b and c N.A. (ii) (a) Medium black. (b) N.A. (iii) 24.11.1956. (iv) (a) N.A. (b) 
   As per treatments. (c) 100 lb./ac. (d) and (e) N.A. (v) S.C.L./ac. of F.Y.M. +30 lb./ac. of N+36 

2. TREATMENTS:
   1. Chinese method : dibbling one seed/hill at 2.5' X 2.5' spacing.
   2. Close spacing method : hand sowing in rows 2.5' apart without plant spacing.
   3. Local method : three way sowing.

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

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Raw 
   data N.A.

5. RESULTS:
   (i) 2942 lb./ac. (ii) N.A. (iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>3552</td>
<td>2800</td>
<td>2473</td>
</tr>
<tr>
<td>S.E., mean</td>
<td></td>
<td></td>
<td>N.A.</td>
</tr>
</tbody>
</table>

   Crop :— Wheat.  
   Site :— Central Expt. Stn., Junagadh.  
   Object :—To study the optimum time of sowing for Wheat crop.

Ref :— Gj. 56(48).  
Type :— 'C'.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sann hemp as G.M. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) As per treatments. (iv) (a) One ploughing and two harrowings. (b) Drilling. (c) 60 lb./ac. (d) Between rows—12"; between plants—irregular. (e) N.A. (v) 125 lb./ac. of A/S in three doses at first irrigation, at tillering and at flag leaf stage. (vi) K—28 (medium). (vii) Irrigated. (viii) Three weedicings and 4 interculturings. (ix) Nil. (x) N.A.

2. TREATMENTS:

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 32' x 11'. (b) 26' x 5'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Number of tillers, height, no. of spikelets, earing dates and grain yield. (iv) (a) 1956—contd. (b) and (c) No (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1091 lb./ac. (ii) 227.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>889</td>
<td>1453</td>
<td>1456</td>
<td>1381</td>
<td>741</td>
<td>626</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>——</td>
<td>——</td>
<td>——</td>
<td>——</td>
<td>——</td>
<td>92.81</td>
</tr>
</tbody>
</table>

— Crop — Wheat.  
— Site — Central Exptl. Stn., Junagadh. 

Object — To study the optimum spacing and seed rate for Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sann hemp as G.M. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 3.10.1956. (iv) (a) Two ploughings and 2 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Top dressing with 125 lb./ac. of A/S in three doses at 1st irrigation, tillering and at flag leaf stage. (vi) K—28 (medium). (vii) Irrigated. (viii) Two weedicings and 4 interculturings. (ix) Nil. (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)+T (extra treatment)
(1) 3 spacings between rows: R1 = 9", R2 = 12" and R3 = 18".
(2) 3 seed rates: S1 = 40, S2 = 60 and S3 = 80 lb./ac.
T: broadcasting of 80 lb./ac. of seed; spacing between plants is irregular.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 30' x 13'. (b) 24' x 6'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. No lodging. (ii) Slight attack of rust. (iii) Height, stand count, spikelets, earing dates and grain yield. (iv) (a) 1956—contd. (modified in 1957). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1441 lb./ac. (ii) 136.4 lb./ac. (iii) Interaction R x S alone is significant. (iv) Av. yield of grain in lb./ac.
T=1456 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>1629</td>
<td>1569</td>
<td>1398</td>
<td>1532</td>
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<tr>
<td>S₂</td>
<td>1428</td>
<td>1475</td>
<td>1362</td>
<td>1422</td>
</tr>
<tr>
<td>S₃</td>
<td>1279</td>
<td>1282</td>
<td>1533</td>
<td>1365</td>
</tr>
</tbody>
</table>

Mean | 1445 | 1442 | 1431 | 1439

S.E. of any marginal mean = 45.46 lb./ac.
S.E. of T vs any other mean = 90.82 lb./ac.
S.E. of body of table or T mean = 78.73 lb./ac.

**Crop:** Wheat.

**Site:** Central Expt. Sta., Junagadh.

**Object:** To study the optimum spacing and seed rate for Wheat.

1. **BASAL CONDITIONS:**
   
   (i) Nil.  
   (b) Sannhemp as G.M.  
   (c) N.A.  
   (d) Medium black.
   
   (b) Refer soil analysis, Junagadh.  
   (iv) Nil.  
   (v) 0.12 ploughing and two harrowings.  
   (d) Drilling.  
   (c) and (d) As per treatments.  
   (b) N.A.  
   (iv) Ammo. Phos. at 1 lb./plot before sowing in furrows and 1 lb./plot at tillering.
   
   (v) S-56 medium.  
   (vi) Irrigated.  
   (vii) Two weeding and one intercutting.  
   (x) Nil.  
   (x) 1.3.1955.

2. **TREATMENTS:**
   
   All combinations of 1, and 2.
   
   (1) 4 spacings between rows: R₁=9", R₂=12", R₃=18" and R₄=broadcasting,
   
   (2) 3 seed rates: S₁=40, S₂=60 and S₃=80 lb./ac.
   
   Spacing between plants is irregular.

3. **DESIGN:**
   
   (i) Fact. in R.B.D.  
   (ii) a, 12.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) 30' x 12'.  
   (b) 24' x 6'.  
   (v) 3' all round the net plot.  
   (vi) Yes.

4. **GENERAL:**
   
   (i) Good. No lodging.  
   (ii) Slight attack of rust.  
   (iii) Earing dates, height, no. of spikelets and grain yield.  
   (iv) a 1956—contd.  
   (b) No. (c) Nil.  
   (c) N.A.  
   (d) N.A.  
   (v) and (vii) Nil.

5. **RESULTS:**
   
   (i) 1775 lb./ac.  
   (ii) 177.7 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>1746</td>
<td>1795</td>
<td>1738</td>
<td>1584</td>
<td>1716</td>
</tr>
<tr>
<td>S₂</td>
<td>1875</td>
<td>1888</td>
<td>1856</td>
<td>1725</td>
<td>1836</td>
</tr>
<tr>
<td>S₃</td>
<td>1712</td>
<td>1739</td>
<td>1850</td>
<td>1791</td>
<td>1773</td>
</tr>
</tbody>
</table>

Mean | 1778 | 1807 | 1815 | 1700 | 1775

S.E. of R marginal mean = 51.31 lb./ac.
S.E. of S marginal mean = 44.44 lb./ac.
S.E. of body of table = 88.88 lb./ac.

**Ref:** Gj. 57(56).

**Type:** ‘C’.
Crop :- Wheat (Rabi).
Site :- Central Expt. Stn., Junagadh.

Object :- To study the optimum spacing and seed rate for Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) Nil. (ii) (a) Medium Black. (b) Refer soil analysis, Junagadh. (iii) 4.12.1958. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) -. (v) N at 40 lb./ac. and P₂O₅ at 40 lb./ac. at sowing. (vi) S-56. (vii) Irrigated. (viii) One hoeing. (ix) Nil. (x) 6.4.1959.

2. TREATMENTS:
   Same as in expt. no. 57(56) on page 108.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 30'x12'. (b) 24'x6'. (v) 3'x3'. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1761 lb./ac. (ii) 269.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>1597</td>
<td>1704</td>
<td>1692</td>
<td>1531</td>
<td>1631</td>
</tr>
<tr>
<td>S₂</td>
<td>1862</td>
<td>1765</td>
<td>1962</td>
<td>1521</td>
<td>1777</td>
</tr>
<tr>
<td>S₃</td>
<td>1758</td>
<td>1891</td>
<td>1926</td>
<td>1919</td>
<td>1874</td>
</tr>
<tr>
<td>Mean</td>
<td>1739</td>
<td>1787</td>
<td>1860</td>
<td>1657</td>
<td>1761</td>
</tr>
</tbody>
</table>

S.E. of R marginal means = 77.80 lb./ac.
S.E. of S marginal means = 67.38 lb./ac.
S.E. of body of table = 134.75 lb./ac.

Crop :- Wheat.

Object :- To find out a suitable method of sowing for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Groundnut—Wheat. (b) Groundnut. (c) Nil. (ii) (a) Sandy soil. (b) N.A. (iii) 22.11.1958. (iv) (a) N.A. (b) As per treatments. (c) N.A. (d) As per treatment. (e) -. (v) 5 C.L./ac. of F.Y.M. (vi) N.P.—718. (vii) Irrigated. (viii) N.A. (ix) 12°. (x) 11.3.1959.

2. TREATMENTS:
   1. Line sowing at 9" distance between rows.
   2. Line sowing at 18" distance between rows.

3. DESIGN
   (i) R.B.D. (ii) (a) 3. (b) 45'x40'. (iii) 5. (iv) (a) 15'x40'. (b) 12'x36'. (v) 1.5'x2'. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) No. (b) -. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 414 lb./ac.  (ii) 62.71 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>467</td>
<td>309</td>
<td>467</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>28.03 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Object :- To study the effect of different spacings on Wheat.

5. RESULTS:

(i) 6~8 lb./ac.  (ii) 34 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>758</td>
<td>538</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>9.85 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Site :- Irrigation Demonstration Farm, Umrala.  
Object :- To find out the optimum time of sowing for Wheat.

2. BASAL CONDITIONS:

(i) a: Nil.  b: Bajra  c: Nil.  (ii) (a) Medium black.  (b) N.A.  (iii) 25.11.1956.  (iv) (a) N.A.  (b) Drilling.  c: 100 lb./ac.  (d) As per treatments.  (e) —.  (v) Nil.  (vi) Kenphad.  (vii) Irrigated.  (viii) One weeding.  (ix) N.A.  (x) 20.3.1957.

2. TREATMENTS:

(i) 18' spacing between rows.  
(ii) 36' spacing between rows.

3. DESIGN:

(i) R.B.D.  (ii) 2.  (b) N.A.  (iii) 12.  (iv) (a) and (b) 45'x12'.  (v) Nil.  (vi) Yes.

2. TREATMENTS:


3. DESIGN:

(i) 5x5 L-Sq.  (ii) a: 5.  (b) N.A.  (iii) 5.  (iv) (a) 24'x18'.  (b) 21'x15'.  (v) 1.5' around the plot.  (vi) Yes.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 968 lb./ac. (ii) 85.24 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>671</td>
<td>857</td>
<td>927</td>
<td>1148</td>
<td>1238</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>38.05 lb./ac.</td>
<td></td>
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</table>

Crop :- Wheat.
Site :- Irrigation Demonstration Farm, Umrala.
Ref :- Gj. 57(76).
Type :- 'C'.

Object :- To find out the optimum time for sowing Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sannhemp as G.M. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) As per treatments. (iv) (a) One ploughing and 3 harrowings. (b) to (e) N.A. (v) 30 lb./ac. of N as A/S +18 lb./ac. of P2O5 as super. (vi) Kenphad—28 (medium). (vii) Irrigated... (viii) One weeding. (ix) Nil. (x) 8.3.1958.

2. TREATMENTS:

3. DESIGN:
(i) 5 x 5 L. Sq. (ii) (a) S. (b) N.A. (iii) 5. (iv) (a) 24' x 18'. (b) 21' x 15'. (v) All round the plot. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Height of plants and grain yield. (iv) (a) 1956—1957. (b) No. (c) Nil. (d) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1130 lb./ac. (ii) 122.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
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<tr>
<td>Av. yield</td>
<td>746</td>
<td>1047</td>
<td>1083</td>
<td>1230</td>
<td>1542</td>
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<tr>
<td>S.E./mean</td>
<td>54.93 lb./ac.</td>
<td></td>
<td></td>
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</tbody>
</table>

Crop :- Wheat.
Site :- Irrigation Demonstration Farm, Umrala.
Ref :- Gj. 58(2).
Type :- 'C'.

Object :- To ascertain the optimum time for sowing Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) As per treatments. (iv) (a) One ploughing. (b) Drilling. (c) 90 lb./ac. (d) 5' between rows. (e) —. (v) Nil. (vi) N.P.—718. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) For treatments D1 and D2—27.2.1957, for D3 and D4—30.2.1959, for D5—14.3.1959 and for D6—24.3.1959.

2. TREATMENTS:
3. DESIGN:
(i) R.B.D., (ii) 6. (b) N.A. (iii) 5. (iv) (a) 24 x 18'. (b) 21 x 15'. (v) 1.5' around the net plot. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) N. (c) Nil. (d) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1652 lb/ac. (ii) 102.8 lb/ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>D₅</th>
<th>D₆</th>
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<tr>
<td>Av. yield</td>
<td>1548</td>
<td>1818</td>
<td>1784</td>
<td>1618</td>
<td>1634</td>
<td>1507</td>
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<tr>
<td>S.E./mean</td>
<td>45.96 lb/ac.</td>
<td></td>
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</table>

Ref: Gj. 57(35).
Type: ‘CV’.

Object: To find out suitable seed rate for different varieties of Wheat.

1. BASAL CONDITIONS:
(i) 'a Nil. (b) Sann as G.M. (c) 220 lb/ac. of Super. (ii) 'a Medium black. (b) Refer soil analysis, Halvad. (iii) 8.11.1957. (iv) (a) Ploughing, harrowing and cultivation by drill. (b) N.A. (v) 200 lb/ac. of super before soaking dose, 200 lb/ac. of A/S, 200 lb/ac. of manure mixture and 100 lb/ac. of castor cake broadcast before sowing. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) N.D. 'x' N.A.

2. TREATMENTS:
Main-plot treatments:
2 varieties: V₁=N.P-710 and V₂=Kenphad.
Sub-plot treatments:
3 seed rates: R₁=60, R₂=80 and R₃=100 lb/ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) N.A. (v) 3 rows on each side. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Height of plant, no. of earheads, length of earheads, no. of spikes/earhead. Grain and fodder yield. (iv) (a) 1957—contd. (b) and (c) N. (d) (a) and (b) N.A. (e) 'x' and (vii) Nil.

5. RESULTS:
(i) 1817 lb/ac. (ii) 'a 132.7 lb/ac. (b) 143.3 lb/ac. (iii) Main effect of V is significant. Effect of R and interaction V X R are not significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>Mean</th>
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<td>1884</td>
<td>1872</td>
<td>1880</td>
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<tr>
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<tr>
<td>Mean</td>
<td>1815</td>
<td>1839</td>
<td>1798</td>
<td>1817</td>
</tr>
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</table>

S.E. of difference of two
1. V marginal means = 44.23 lb/ac.
2. R marginal means = 58.50 lb/ac.
3. R means at the same level of V = 82.73 lb/ac.
4. V means at the same level of R = 80.74 lb/ac.
Crop :- Wheat.
Site :- Agri. Res. Stn., Dabhoi.

Object :- To find out an improved method of cultivation for Wheat.

1. BASEL CONDITIONS :
   (i) (a) Nil. (b) N.A. (c) N.A.  
   (ii) (a) Medium black. (b) Refer soil analysis, Dabhoi.  
   (iii) 15.11.1957.  
   (iv) (a) N.A. (b) Drilling.  
   (c) As per treatments. (d) 12" between rows. (c) Nil. (v) Kenphad.  

2. TREATMENTS :
   2 methods of cultivation : M1 = improved — sann G.M. at 60 lb./ac.; seed rate at 40 lb./ac.; 40 lb./ac. of N as A/S applied on 8.12.1957 and 30.12.1957 and M2 = local — sann G.M. at 60 lb./ac.; seed rate at 80 lb./ac. and no top dressing.

3. DESIGN :
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) 40'x36'. (b) 36'x30'. (v) 2'x3'. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 885 lb./ac. (ii) 167.4 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment  M1  M2
   Av. yield   1223  548

   S.E./mean = 83.70 lb./ac.

Crop :- Wheat.
Site :- Agri. Res. Stn., Dabhoi.

Object :- To find out an improved method of cultivation for Wheat.

1. BASEL CONDITIONS :
   (i) (a) Nil. (b) Cotton. (c) 1.7 C.L./ac. of F.Y.M. + 63 lb./ac. of A/S. (ii) (a) Black. (b) Refer soil analysis, Dabhoi. (iii) 15.11.1958.  
   (iv) (a) Nil. (b) Drilling. (c) As per treatments. (d) 12" between rows. (e) Nil. (v) Kenphad. (vi) Irrigated. (vii) Nil. (ix) N.A. (x) 4.4.1959.

2. TREATMENTS :
   2 methods of cultivation : M1 = improved — sann G.M. at 60 lb./ac.; 40 lb./ac. of N as A/S applied in two doses; seed rate at 40 lb./ac. and M2 = local — sann G.M. at 60 lb./ac.; seedrate at 80 lb./ac. and no top dressing.

3. DESIGN :
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) 40'x36'. (b) 36'x30'. (v) 2'x3'. (vi) Yes.

4. GENERAL :
   (i) Not satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Abnormal season. (vii) Nil.

5. RESULTS :
   (i) 368 lb./ac. (ii) 96.79 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

   Treatment  M1  M2
   Av. yield   455  281

   S.E./mean = 48.39 lb./ac.
Crop :- Wheat.
Site :- Agri. Res. Sta., Dabhoi.

Object :- To find out an improved method of cultivation for Wheat.

1. BASAL CONDITIONS:
   (i) a: Nil. (b) Cotton. (c) 8 C.L./ac. of F.Y.M. (ii) (a) Black. (b) Refer soil analysis, Dabhoi. (iii) 22.12.1959. (iv) (a) 2 ploughings and one harrowing. (b) Drilling. (c) As per treatments. (d) 12' between rows. (e) —. (v) Nil. (vi) Kenphad. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 20.4.1960.

2. TREATMENTS:
   2 methods of cultivation : M₁ = improved—40 lb./ac. of N as A/S; seed rate at 40 lb./ac. and M₂ = local—10 C.L./ac. of F.Y.M.; seed rate at 80 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) 40'×36'. (b) 36'×30'. (v) 2'×3'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 469 lb./ac. (ii) 47.95 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment | M₁ | M₂ | S.E./mean | =23.97 lb./ac.
   1. Paddy sathi in Kharif followed by wheat in Rabi.
   2. Groundnut in Kharif followed by wheat in Rabi.
   3. Groundnut with 20 lb./ac. of P₂O₅ in Kharif followed by wheat in Rabi.
   5. Chinamug with 20 lb./ac. of P₂O₅ in Kharif followed by wheat in Rabi.
   7. Sann with 20 lb./ac. of P₂O₅ in Kharif followed by wheat in Rabi.
   8. Fallow in Kharif followed by wheat in Rabi.

   Paddy and wheat received 40 lb./ac. of N as A/S + 20 lb./ac. of P₂O₅ as Super except in treatment 9.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 60'×24'. (b) 54'×18'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 649 lb./ac. (ii) 78.65 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
Crop :- Wheat.

Object :- To find out a suitable method of sowing and dose of N for Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Jowar. (c) 20 lb./ac. of N as A/S.
   (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 28.11.1956.
   (iv) (a) One ploughing, one harrowing. (b) As per treatments. (c) 90 lb./ac.
   (d) As per treatments. (e) -. (v) Nil. (vi) Kenphad—28. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 27.3.1957.

2. TREATMENTS :
   Main-plot treatments :
   4 methods of sowing : S₁=broadcasting seed, S₂=two-way sowing, S₃=drilling seed 9" apart and S₄=drilling seed 18" apart.
   Sub-plot treatments :
   3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac. of N.
   N applied at the time of sowing.

3. DESIGN :
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 3 subs-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 30'x12'. (b) 24'x6'. (v) 3'x3'. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 953 lb./ac. (ii) (a) 201.2 lb./ac. (b) 171.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
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<tr>
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<td>920</td>
<td>965</td>
<td>973</td>
<td>953</td>
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</table>

S.E. of difference of two
1. S marginal means = 82.1 lb./ac.
2. N marginal means = 60.6 lb./ac.
3. N means at the same level of S = 121.2 lb./ac.
4. S means at the same level of N = 129.6 lb./ac.

Crop :- Wheat.

Object :- To find out a suitable dose of N and method of sowing for Wheat.
1. BASAL CONDITIONS:

(i) a Nil.  
(b) San.  
(c) Nil.  
(ii) a: Medium black.  
(b) Refer soil analysis, Umrula.  
(iii) 31.10.1957.  
(iv) a, One ploughing.  
(b) As per treatment.  
(c) N.A.  
(d) As per treatments.  
(e) N.A.  
(f) San.  
(g) G.M. at the rate of 2000 lb. ac. buried in kharif season.  
(h) N.A.  
(i) Irrigated.  
(j) Nil.  
(k) and x, N.A.

2. TREATMENTS:

Same as in expt. no. 56 '101' on page 115.

3. DESIGN:

(i) Split-plot.  
(ii) a) 4 main-plots replication, 3 sub-plots/main-plot.  
(b) N.A.  
(iii) 4.  
(iv) (a) 12' X 30'.  
(b) 6' X 24'.  
(c) 3' X 3'.  
(v) Yes.  
(vi) N.A.

4. GENERAL:

(i) Good.  
(ii) Nil.  
(iii) Grain and fodder yield.  
(iv) (a) 1956—contd.  
(b) No.  
(c) Nil.  
(v) (a) and 
(b) N.A.  
(vi) and (vii) Nil.

5. RESULTS:

(i) 1452 lb./ac.  
(ii) a, 243.7 lb./ac.  
(iii) 169.1 lb./ac.  
(iv) None of the effects is significant.  
(v) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>N_1</th>
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<td>1429</td>
<td>1483</td>
<td>1452</td>
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</table>

S.E. of difference of two

1. S marginal means = 99.5 lb./ac.
2. N marginal means = 59.8 lb./ac.
3. N means at a level of S = 119.6 lb./ac.
4. S means at a level of N = 139.4 lb./ac.

---

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

**Site :- M.A.E. Farm, Umrula.**

Object :- Type VIII—To determine the optimum seedrate and date of sowing for Wheat when different doses of N and P_2O_5 are applied.

1. BASAL CONDITIONS:

(i) 'Cotton—Jowar—Wheat.  
(b) N.A.  
(c) N.A.  
(ii) 'a', Medium black soil of trap and gneissic origin.  
(b) N.A.  
(iii) As per treatments.  
(iv) a 1 ploughings, 2 harrowings with bakhar.  
(b) N.A.  
(c) As per treatments.  
(d) Rows 9' apart.  
(e) N.A.  
(v) Sannhemp buried as G.M.  
(vi) Irrigated.  
(vii) N.A.  
(viii) N.A.  
(ix) 12 to 28.3.1957.

2. TREATMENTS:

Main-plot treatments:

All combinations of (1' and 2)

1. 3 sordrates : R_1 = 50, R_2 = 70 and R_3 = 90 lb./ac.
2. 3 sowing dates : D_1 = 28.10.2956, D_2 = 12.11.1956 and D_3 = 27.11.1956.

Sub-plot treatments:

All combinations of (1' and 2)

1. 3 levels of N as A S : N_0 = 0, N_1 = 20 and N_2 = 40 lb./ac.
2. 3 levels of P_2O_5 as Super : P_0 = 0, P_1 = 20 and P_2 = 40 lb./ac.

Nitrogenous fertilizers broadcast at the time of sowing and phosphatic fertilizers placed in furrows.
3. DESIGN:
(i) Split-plot. (ii) (a) 9 main-plots/block; 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 30’×12’. (b) 24’×6’. (v) 3’ alround. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—1958. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1728 lb./ac. (ii) (a) 948.9 lb./ac. (b) 285.8 lb./ac. (iii) P effect and interaction NRD are highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>N0</th>
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<td>P2</td>
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<td>1769</td>
<td>1699</td>
<td>1734</td>
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<td>1960</td>
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<td>1677</td>
<td>1832</td>
<td>1903</td>
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S.E. of difference of two
1. D or R marginal means = 182.6 lb./ac.
2. N or P marginal means = 55.0 lb./ac.
3. N or P means at the same level of D or R = 95.3 lb./ac.
4. D or R means at the same level of N or P = 198.5 lb./ac.
5. means in the body of D X R table = 316.3 lb./ac.
6. means in the body of N X P table = 95.3 lb./ac.

Crop :- Wheat (Rabi).

Site :- M.A.E. Farm, Umrala.

Ref :- Gj. 57(MAE).

Type :- 'CM'.

Object :- Type VIII—To determine the optimum seedrate and date of sowing for Wheat when different doses of N and P<sub>2</sub> are applied.

1. BASAL CONDITIONS:
(i) (a) Cotton—Jowar—Wheat. (b) and (c) N.A. (ii) (a) Medium black soil of trap and gneissic origin. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings, 2 harrowings. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) Sannhemp sown for G.M. and applied at the rate of 13,000 lb./ac. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 2nd week of March 1958.

2. TREATMENTS:
Main-plot treatments:
- All combinations of (1) and (2)
  (1) 3 seedrates: R<sub>1</sub>=50, R<sub>2</sub>=70 and R<sub>3</sub>=90 lb./ac.
  (2) 3 sowing dates: D<sub>1</sub>=28.10.1957, D<sub>2</sub>=12.11.1957 and D<sub>3</sub>=27.11.1957.

Sub-plot treatments:
Same as in expit. no. 56(MAE) on page 116.
3: DESIGN and 4. GENERAL:

Same as in expt. no. 56 (MAE) on page 116.

5. RESULTS:

(i) 1466 lb./ac. (ii) 546.3 lb./ac. (b) 265.9 lb./ac. (iii) P effect and interaction D × P are highly significant. Other effects are not significant.

Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>P0</th>
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<th>P2</th>
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<td>1274</td>
<td>1357</td>
<td>1344</td>
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<tr>
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<td>1549</td>
<td>1588</td>
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<td>1070</td>
<td>1762</td>
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<td>1592</td>
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<td>1522</td>
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<td>1486</td>
<td>1551</td>
<td>1456</td>
<td>1468</td>
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<td>1108</td>
<td>1574</td>
<td>1716</td>
<td>1466</td>
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</tbody>
</table>

S.E. of the difference of two

1. D or R marginal means = 105.1 lb./ac.
2. N or P marginal means = 51.2 lb./ac.
3. N or P means at the same level of D or R = 88.6 lb./ac.
4. D or R means at the same level of N or P = 127.6 lb./ac.
5. Means in the body of D × R table = 182.1 lb./ac.
6. Means in the body of N × P table = 88.6 lb./ac.

Crop :- Wheat (Rabi).

Site :- M.A.E. Farm, Umrala.

Object :- Type VIII—To determine the optimum seed rate and date of sowing for Wheat when different doses of N and P2O5 are applied.

1. BASAL CONDITIONS:

(i) a. Cotton—Jowar—Wheat. (b) and (c) N.A. (ii) (a) Medium black soil of trap and gneissic origin. (b) N.A. (iii) As per treatments. (iv) (a) 2 ploughings and 2 harrowings. (b) N.A. (c) As per treatments. (d) and e. N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) March 1959.

2. TREATMENTS:

Main-plot treatments:

All combinations of (1) and (2)

1. 3 seed rates: R1 = 50, R2 = 70 and R3 = 90 lb./ac.

Sub-plot treatments:

Same as in expt. no. 56 (MAE) on page 116 on wheat crop.

3. DESIGN to 4. GENERAL:

Same as in expt. no. 56 (MAE) on page 116.
5. RESULTS:

(i) 1834 lb./ac.  (ii) (a) 496.3 lb./ac.  (b) 314.7 lb./ac.  (iii) P effect is highly significant.  D and N effects and interaction N×P are significant. Other effects are not significant.  (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
<th>R_1</th>
<th>R_2</th>
<th>R_3</th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>P_0</th>
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<th>P_2</th>
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<td>1962</td>
<td>2083</td>
<td>1845</td>
<td>2005</td>
<td>2075</td>
<td>1631</td>
<td>2067</td>
<td>2227</td>
<td>1975</td>
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<td>1585</td>
<td>1874</td>
<td>2044</td>
<td>1834</td>
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</tbody>
</table>

S.E. of the difference of two
1. D or R marginal means = 95.5 lb./ac.
2. N or P marginal means = 60.6 lb./ac.
3. N or P means at the same level of D or R = 104.9 lb./ac.
4. D or R means at the same level of N or P = 128.3 lb./ac.
5. means in the body of DXR table = 165.4 lb./ac.
6. means in the body of NXP table = 104.9 lb./ac.

Crop :- Wheat (Rabi).
Ref :- Gj. 59 (94).
Type :- 'CMV'.

Object :- To determine the optimum spacing, seed rate and manural dose for different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) and (c) N.A.  (ii) (a) Shallow, light black.  (b) Refer soil analysis, Amreli.  (iii) 4.11.1959.
   (iv) (a) One ploughing and 2 borrowings.  (b) Drilling.  (c) and (d) As per treatments.  (e) —.  (v) Nil.

2. TREATMENTS:
All combinations of (1), (2), (3), (4), (5) and (6)
   (1) 2 varieties of wheat : A_0=KCN-133 and A_1=N.P.-710.
   (2) 2 spacings between rows : B_0=9” and B_1=criss-cross drilling.
   (3) 2 seed rates : C_0=60 and C_1=100 lb./ac.
   (4) 2 doses of F.Y.M. : D_0=0 and D_1=10,000 lb./ac.
   (5) 2 levels of N as A/S : E_0=0 and E_1=40 lb./ac.
   (6) 2 levels of P_2O_5 as Super : F_0=0 and F_1=40 lb./ac.
   Time and method of application of manures—N.A.

3. DESIGN:
(i) 2^6 Fact. confd.  (ii) (a) 8 plots/block ; 8 blocks/replication.  (b) N.A.  (iii) One.  (iv) (a) 36’×21’.  (b) 30’×15’.  (v) 3’ around the net plot.  (vi) Yes.

4. GENERAL:
   (i) Normal.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1959—contd.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.
5. RESULTS:
(i) 1398 lb./ac.  (ii) 207.3 lb./ac.  (iii) Effect of F and interaction E \times F are highly significant. Effect of D and E are significant. Others are not significant. (iv) Mean and differential responses in lb./ac.

<table>
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<tr>
<th>Differential response</th>
<th>Mean response</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<td>+</td>
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<td>+</td>
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</tr>
<tr>
<td>A -128.53</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-124.33 -132.73</td>
<td>-90.39 -166.67</td>
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<tr>
<td>C 29.31</td>
<td></td>
<td>126.14 -67.52</td>
<td>-</td>
<td>-</td>
<td>5.08 53.54</td>
<td>33.51 25.11 -18.51 77.13</td>
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<tr>
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<td></td>
<td>155.18 127.42</td>
<td>117.07 165.53</td>
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<td>-</td>
<td>193.36 89.24 201.13 79.47</td>
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<td>256.83 352.47</td>
<td>366.48 242.82 157.67 451.63</td>
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</tr>
</tbody>
</table>

S.E. of mean response =51.8 lb./ac.
S.E. of differential response =73.3 lb./ac.

Crop := Wheat (Rabi).

Object := To study the effect of different seed rates and fertilizers on different varieties of Wheat.

1. BASAL CONDITIONS:
(i) 'a' Legume—Cereal—Cotton. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 16.11.1958. (iv) (a) N.A. (b) Drilling. (c) As per treatments. (d) 9'. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 8 weedings. (ix) 13.10'. x) 5, 9 and 18.3.1959, and 2, 8.4.1959.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1), (2), (3) and (4)
(1) 3 varieties : V\(_0\)=N.P.—710; V\(_1\)=N.P.—718 and V\(_2\)=Kenphad.
(2) 3 seed rates: S\(_0\)=40, S\(_1\)=60 and S\(_2\)=80 lb./ac.
(3) 3 doses of N : N\(_0\)=0, N\(_1\)=20 and N\(_2\)=40 lb./ac.
(4) 3 doses of P\(_2\)O\(_5\) : P\(_0\)=0, P\(_1\)=20 and P\(_2\)=40 lb./ac.
Sub-plot treatments:
2 levels of F.Y.M.: F\(_0\)=0 and F\(_1\)=10 C.L./ac.

3. DESIGN:
(i) 3\(^2\) Split-plot confd. (ii) (a) 9 blocks/replication ; 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) (a) 33'\times18'. (b) 30'\times15'. (c) 1.5' around the plot. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Light attack of rust. (iii) Grain yield. (iv) (a) 1958—cond. (b) and (c) —. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 191.5 lb./ac. (ii) 111.0 lb./ac. (iii) Main effects of V, N and P are highly significant. Others are not significant. (iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th></th>
<th>V₀</th>
<th>V₁</th>
<th>V₂</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>N₀</th>
<th>N₁</th>
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</table>

S.E. of difference of two:

1. V, S, N or P marginal means = 36.9 lb./ac.
2. F marginal means = 17.4 lb./ac.
3. F means at a level of V, S, N or P = 30.2 lb./ac.
4. V, S, N or P means at a level of F = 42.5 lb./ac.
S.E. of body of any table not involving F = 45.14 lb./ac.

Crep -> Wheat (Rabi).


Ref -> Gj. 59(79).
Type -> 'CMV'.

Object: -> To study the effect of different seed rates and fertilizers on different varieties of Wheat.

1. BASAL CONDITIONS:
(i) Legume—Cereal— Cotton. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 21, 22, 23.11.1959. (iv) (a) Three ploughings and 2 harrowings. (b) Drilling. (c) As per treatments. (d) 9". (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) 3 weedings. (ix) Nil. (x) 26.3.1960.

2. TREATMENTS:
Same as in expt. no. 58 (85) on page 120.

3. DESIGN:
(i) 3₄×2 split-plot confd. (ii) (a) 9 blocks/replication; 9 main-plots/block; 2 sub-plots/train-plot. (b) N.A. (iii) 1. (iv) (a) 34'×20'. (b) 30'×15'. (v) 2'×2.5'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Slight attack of grass-hoppers and stem-borers. (iii) Grain and fodder yield. (iv) (a) 1958—cond. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 868 lb./ac. (ii) (a) 234.1 lb./ac. (b) 145.6 lb./ac. (iii) Main effect of N and P, interaction N×P are significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.
Crop: Wheat (Rabi).  
Ref: Gj. 59(12).  
Type: 'CMV'.

Object: To determine the optimum spacing, seed rate and material dose for different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) 'a' Legum—Cereal—Cotton. (b) Fallow. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. iii 26.11.1959. (iv) (a) 3 ploughings and 2 harrowings. (b) Drilling. (c) and (d) As per treatments. e — (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Three weedings. (ix) Nil. 'x' 1.4.1960.

2. TREATMENTS:
   Same as in exp. no. 59.94i on page 119.

3. DESIGN:
   (i) 2² confd. ii a 8 plots/block; 8 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 36' x 15'. (b) 30' x 12' (v) 3' x 1.5'. (vi) Yes.

4. GENERAL:
   (i) Very good. Slight lodging due to high winds and rains. (ii) Slight attack of grass-hoppers and stem borers. (iii) Grain yield. (iv) 1959—contd. (b) No. (c) Nil. (v) (a) Junagadh and Jamnagar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1637 lb./ac.  (ii) 227.0 lb./ac.  (iii) Main effect of F and interaction A x C are significant. Other effects are not significant.  (iv) Mean and differential responses in lb./ac.

<table>
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<tr>
<th></th>
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<th>V₁</th>
<th>V₂</th>
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2. F marginal means = 22.9 lb./ac.
3. F means at a level of V, S, N or P = 39.6 lb./ac.
3. V, S, N or P means at a level of F = 53.1 lb./ac.
S.E. of body of any table not involving F = 55.18 lb./ac.
Differential response

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S.E. of mean response = -56.75 lb./ac.
S.E. of differential response = -80.26 lb./ac.

Crop: Wheat (Rabi).

Site: Agri. Res. Farm, Jamnagar.

Object: To study the effect of different seed rates and fertilizers on different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 19.11.1958. (iv) (a) N.A. (b) Hand sowing. (c) As per treatments. (d) 9' between rows. (e) (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Two weedings. (ix) 28.42'. (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 58(85) on page 120.

3. DESIGN:
   (i) 3\(\times\)2 split-plot. (ii) (a) 9 blocks/replication; 9 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) (iv) (a) 15'x30'. (b) 12'x27'. (v) 1.5'x1.5'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iii) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 884 lb./ac. (ii) (a) 140.8 lb./ac. (b) 121.2 lb./ac. (iii) Effect of N, P, F and interaction P X S and V X S are highly significant. Interaction P X F is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

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124

S.E. of difference of two
1. V, S, N or P marginal means =27.1 lb./ac.
2. F marginal means =19.0 lb./ac.
3. F means at a level of V, S, N or P =33.0 lb./ac.
4. V, S, N or P means at a level of F =35.8 lb./ac.
S.E. of body of any table not involving F =62.78 lb./ac.

Crop :- Wheat (Rabi).
Site :- Agri. Res. Farm, Jamnagar.

Object :-To study the effect of different seed rates and fertilizers on different varieties of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Clayey loam to medium black. (b) N.A. (iii) 16.11.1959. (iv)
   (a) One ploughing and 1 harrowing. (b) Drilling. (c) As per treatments. (d) N.A. (e) —. (v) Nil.
   (vi) As per treatments. (vii) Irrigated. (viii) One weeding and 2 interculturings. (ix) 30". (x) 12.3.1960.

2. TREATMENTS :
   All combinations of (1), (2), (3), (4) and (5)
   (1) 3 varieties : V₀=N.P.—710, V₁=N.P.—718 and V₂=Kenphad—28.
   (2) 3 seed rates : S₀=40, S₁=60 and S₂=80 lb./ac.
   (3) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.
   (4) 3 levels of P₂₀ : P₀=0, P₁=20 and P₂=40 lb./ac.
   (5) 2 levels of F.Y.M. : F₀=0 and F₁=10 C.L./ac.

3. DESIGN :
   (i) 3×2 confd. (ii) (a) 9 blocks/replication; 18 plots/block. (b) N.A. (iii) 1. (iv) (a) 30'×15'. (b)
   24'×9'. (v) 3'×3'. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—coastd. (b) No. (c) Nil. (v) (a) Halvad and Junagadh.
   (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1327 lb./ac. (ii) 175.5 lb./ac. (iii) Interactions N×P, N×V and V×S are significant. Other effects are
   not significant. (iv) Av. yield of grain in lb./ac.

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Crop: Wheat (Rabi).
Site: Central Expt. Stn., Junagadh.

Object: To study the effect of different seed rates and fertilizers on different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) N.A. (iv) (a) and (b) N.A. (c) As per treatments. (d) N.A. (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) Nil. (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 58(85) on page 120.

3. DESIGN:
   (i) 3³ x 2 split-plot confd. (ii) (a) 9 blocks/replication; 9 main-plots/block; 2 sub-plots/main-plot. (b) 99' x 108'. (iii) 1. (iv) (a) 33' x 18'. (b) 30' x 15'. (v) 1.5' x 1.5'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1526 lb./ac. (ii) (a) 275.1 lb./ac. (b) 181.6 lb./ac. (iii) P and F effects are highly significant. N effect is significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

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<td>1706</td>
<td>1636</td>
<td>1594</td>
<td>1720</td>
<td>1704</td>
<td>1603</td>
<td>1685</td>
<td>1739</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N₀</td>
<td>1456</td>
<td>1452</td>
<td>1526</td>
<td>1353</td>
<td>1526</td>
<td>1418</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>N₁</td>
<td>1566</td>
<td>1614</td>
<td>1493</td>
<td>1486</td>
<td>1619</td>
<td>1568</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N₂</td>
<td>1603</td>
<td>1618</td>
<td>1543</td>
<td>1579</td>
<td>1547</td>
<td>1639</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S₀</td>
<td>1474</td>
<td>1499</td>
<td>1445</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S₁</td>
<td>1582</td>
<td>1631</td>
<td>1479</td>
<td></td>
<td></td>
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<tr>
<td>S₂</td>
<td>1569</td>
<td>1555</td>
<td>1501</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V, S, N or P marginal means = 52.9 lb./ac.
2. F marginal means = 28.5 lb./ac.
3. F means at the same level of V, S N or P = 49.4 lb./ac.
4. V, S, N or P means at the same level of F = 63.4 lb./ac.
S.E. of body of any table not involving F = 64.84 lb./ac.
Crop: - Wheat (Rabi).
Site: - Central Expt. Stn., Junagadh.

Object: - To study the effect of different seed rates and fertilizers on different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) a. Nil. b and c. N.A. 
   (ii) Refer soil analysis, Junagadh. 
   (iii) 24 to 29.11.1953. 
   (iv) a. One ploughing and 1 harrowing. 
   (v) Nil. 
   (vi) As per treatments. 
   (vii) Irrigated. 
   (viii) Two interculturings and 2 weedings. 
   (ix) Nil. 

2. TREATMENTS:
   Same as in exp. no. 58 (85) on page 120.

3. DESIGN:
   (i) 3 x 2 split-plot. 
   (ii) 9 blocks/repl.; 9 main-plots/block; 2 sub-plots/main-plot. 
   (iii) 18' x 33'. 
   (iv) 15' x 30'. 
   (v) Yes.

4. GENERAL:
   (i) Good. 
   (ii) Nil. 
   (iii) Grain and fodder yield. 
   (iv) (a) 1958—contd. 
   (v) N.A.

5. RESULTS:
   (i) 1033 lb./ac. 
   (ii) 334.9 lb./ac. 
   (iii) V effect is highly significant. F effect is significant. Other effects are not significant. 
   (iv) Avg. yield of grain in lb./ac.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sann. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Unerala. (iii) 8, 9.11.1959.
   (iv) (a) One ploughing and 1 harrowing. (b) Drilling. (c) As per treatments. (d) 9" between rows.
   (e)—. (v) Sann green manuring (amount N.A.). (vi) As per treatments. (vii) Irrigated. (viii) Nil.
   (ix) 25.98". (x) 20.22.3.1960.

2. TREATMENTS:
   Same as in expt. no. 58(85) on page 120.

3. DESIGN:
   (i) 3\(\times\)2 split-plot. (ii) (a) 9 blocks/replication ; 9 main-plots/block; 2 sub-plots/main-plot. (b) N.A.
   (iii) 1. (iv) (a) 18' x 33'. (b) 15' x 30'. (v) 1.5' around the net plot. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1582 lb./ac. (ii) (a) 341.7 lb./ac. (b) 216.8 lb./ac. (iii) P effect is highly significant. V effect is signi
   ficant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

   \[
   \begin{array}{ccccccccccc}
   & V_0 & V_1 & V_2 & S_0 & S_1 & S_2 & N_0 & N_1 & N_2 & \text{Mean} \\
   F_0 & 1575 & 1652 & 1511 & 1556 & 1552 & 1630 & 1484 & 1621 & 1631 & 1579 \\
   F_1 & 1635 & 1660 & 1458 & 1543 & 1620 & 1590 & 1504 & 1590 & 1660 & 1585 \\
   \text{Mean} & 1605 & 1656 & 1485 & 1550 & 1586 & 1610 & 1494 & 1607 & 1647 & 1582 \\
   P_0 & 1424 & 1414 & 1235 & 1291 & 1319 & 1462 & 1347 & 1352 & 1376 & 1582 \\
   P_1 & 1574 & 1751 & 1556 & 1616 & 1636 & 1629 & 1555 & 1695 & 1633 & 1582 \\
   P_2 & 1819 & 1803 & 1663 & 1742 & 1804 & 1738 & 1582 & 1773 & 1931 & 1582 \\
   S_0 & 1534 & 1548 & 1400 & 1488 & 1543 & 1452 & 1347 & 1352 & 1376 & 1582 \\
   S_1 & 1602 & 1601 & 1615 & 1548 & 1554 & 1716 & 1555 & 1695 & 1633 & 1582 \\
   S_2 & 1680 & 1819 & 1439 & 1613 & 1662 & 1663 & 1555 & 1695 & 1633 & 1582 \\
   \end{array}
   \]

   S.E. of difference of two:
   1. V, S, N or P marginal means = 65.8 lb./ac.
   2. F marginal means = 34.1 lb./ac.
   3. F means at the same level of V, S, N or P = 59.0 lb./ac.
   4. V, S, N or P means at the same level of F = 77.9 lb./ac.
   S.E. of body of any table not involving F = 80.5 lb./ac.

Crop: Wheat.
Object: To find out the economic rate of irrigation for Wheat.

Ref: Gj. 59(93).
Type: 'P'.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Shallow, light black. (b) Refer soil analysis, Amreli. (iii) 24.10.1959.
   (iv) (a) One ploughing and 2 harrowings. (b) Drilling. (c) 80 lb./ac. (d) 9" between rows. (e)—.
   (v) 5 C.L/ac. of F.Y.M. (vi) K.C.N.-133. (vii) As per treatments. (viii) 3-4 interculturings and 2 weedings.
2. TREATMENTS:
6 levels of irrigation: I = 5, I = 7, I = 9, I = 11, I = 13 and I = 15 irrigations.

3. DESIGN:
(i) R.B.D. (ii) a 6. b N.A. (iii) 4. (iv) (a) 45'x27'. (b) 42'x24'. (v) 1.5'x1.5'. (vi) Yes.

4. GENERAL:
(i) Normal. a Nil. (ii) Grain yield. (iv) (a) 1954—contd. (b) Nil. (v) (a) and (b: N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1315 lb./ac. (ii) 97.15 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
<th>I₄</th>
<th>I₅</th>
<th>I₆</th>
<th>S.E. mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1058</td>
<td>1123</td>
<td>1265</td>
<td>1323</td>
<td>1556</td>
<td>1575</td>
<td>=48.57 lb./ac.</td>
</tr>
</tbody>
</table>

Object: To study the effect of different intervals of irrigation on the yield of Wheat.

6. BASAL CONDITIONS:
(i) (a') Legume—Cereal—Cotton. (b) Mag. (c) Nil. (d) M. (e) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 20.11.1959. (iv) ‘a’. Three ploughings, 2 harrowings. (b) Drilling. (c) 60 lb./ac. (d) 9’. e —. (v) 40 lb. ac. of N~40 lb. ac. of P₂O₅ broadcast. (vi) N.P.—710. (vii) As per treatments. (viii) 3 weedings. (ix) Nil. x 23.3.1960.

2. TREATMENTS:
I₁=5 irrigations at interval of 18 days.
I₂=7 irrigations at interval of 13 days.
I₃=9 irrigations at interval of 10 days.

3. DESIGN:
(i) R.B.D. (ii) a 3. (b) N.A. (iii) 6. (iv) (a) 70'x26.25'. (b) 60'x18.75'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Light attack of grass hoppers and stem-borers. (iii) Grain yield. (iv) (a) 1955—contd. (modified in 1959. (b) No. (c) Nil. (d) (a) and (b) N.A. (e) and (vii) Nil.

5. RESULTS:
(i) 1315 lb./ac. (ii) 74.38 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1303</td>
<td>1355</td>
<td>1286</td>
</tr>
<tr>
<td>S.E. mean</td>
<td>=30.37 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Object: To study the effect of different intervals of irrigation on the yield of Wheat.
BASAL CONDITIONS:
(i) (a) Legume—Cereal—Cotton. (b) Sann for G.M. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 27 and 28.11.1958. (iv) (a) 2 ploughings. (b) Drilling. (c) 60 lb./ac. (d) 9°. (e) —. (v) 100 lb./ac. of P$_2$O$_5$+100 lb./ac. of manure mixture+100 lb./ac. of A/S. (vi) N.P.-710. (vii) As per treatments. (viii) Two weedings. (ix) 13°. (x) 21.3.1959, 11 and 15.4.1959.

TREATMENTS:
3 intervals of irrigation: $I_1=14$, $I_2=21$ and $I_3=28$ days.

DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 54'×20'. (b) 44'×8.25'. (v) 5'×6'. (vi) Yes.

GENERAL:
(i) Good. (ii) Slight attack of rust. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Junagadh, Jamnagar and Umrala. (b) N.A. (vi) and (vii) Nil.

RESULTS:
(i) 2302 lb./ac. (ii) 580.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$I_1$</th>
<th>$I_2$</th>
<th>$I_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1439</td>
<td>4140</td>
<td>1327</td>
</tr>
</tbody>
</table>

S.E./mean =290.1 lb./ac.

Crop:—Wheat.
Site:—Agri. Res. Farm, Jamnagar.

Object:—To find out the optimum level of irrigation for Wheat.

BASAL CONDITIONS:
(i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Clayey loam to medium black. (b) N.A. (iii) 14.11.1959. (iv) (a) 1 ploughing and harrowing. (b) to (e) N.A. (v) 40 lb./ac. of N and 40 lb./ac. of P$_2$O$_5$. (vi) N.P.-798. (vii) As per treatments. (viii) One weeding and 1 interculturing. (ix) 30°. (x) N.A.

TREATMENTS:
6 levels of irrigation: $I_1=5$, $I_2=7$, $I_3=9$, $I_4=11$, $I_5=13$ and $I_6=15$ irrigations.

DESIGN:
(i) R.B.D. (ii) (a) 6. (b) 72'×45'. (iii) 4. (iv) (a) 36'×15'. (b) 30'×9'. (v) 3'×3'. (vi) Yes.

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

RESULTS:
(i) 1477 lb./ac. (ii) 179.9 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$I_1$</th>
<th>$I_2$</th>
<th>$I_3$</th>
<th>$I_4$</th>
<th>$I_5$</th>
<th>$I_6$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1255</td>
<td>1531</td>
<td>1422</td>
<td>1570</td>
<td>1409</td>
<td>1674</td>
</tr>
</tbody>
</table>

S.E./mean =89.95 lb./ac.

Crop:—Wheat (Rabi).
Site:—Agri. Res. Sta., Umrala.

Object:—To find out the optimum number of irrigations for Wheat.
1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Sanhoff for G.M. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 1.11.1956. (iv) (a) N.A. (b) Drillings. (c) 90 lb./ac. (d) 9' between rows. (e) ---. (v) Sanhoff as G.M. at the rate of 20,000 lb./ac. buried in soil during Kharif. (vi) Kenphad—28. (vii) As per treatments. (viii) N.A. (ix) N.A. (x) 13.3.1957.

2. **TREATMENTS**:
3 levels of irrigation: \( I_1 = 4 \), \( I_2 = 5 \) and \( I_3 = 6 \) irrigations.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 30' x 12'. (b) 24' x 6'. (v) 3' x 3'. (vi) Yes.

4. **GENERAL**:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   (i) 1160 lb./ac. (ii) 207.5 lb./ac. (iii) Treatments differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( I_1 )</th>
<th>( I_2 )</th>
<th>( I_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>951</td>
<td>1219</td>
<td>1311</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>84.73</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop:** Wheat *(Rabi)*. **Ref:** Gj. 57(78).  
**Site:** Agri. Res. Stn., Umrala.  
**Type:** ‘I’.

Object:—To find out the optimum number of irrigations for Wheat crop.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Sunnhemp for G.M. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 28.10.1957. (iv) (a) One ploughing, two harrowings. (b) to (e) N.A. (v) 30 lb./ac. of N as A/S. (vi) Kenphad—28 (medium). (vii) As per treatments. (viii) N.A. (ix) Nil. (x) 3.3.1958.

2. **TREATMENTS**:
3 levels of irrigation: \( I_1 = 4 \), \( I_2 = 5 \) and \( I_3 = 6 \) irrigations.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 30' x 12'. (b) 24' x 6'. (v) 3' x 3'. (vi) Yes.

4. **GENERAL**:
   (i) Good. (ii) Nil. (iii) Height of plants, grain and fodder yield. (iv) (a) 1956—1957. (b) N.A. (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   (i) 641 lb./ac. (ii) 112.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( I_1 )</th>
<th>( I_2 )</th>
<th>( I_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>576</td>
<td>608</td>
<td>740</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>45.98</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop:** Wheat. **Ref:** Gj. 59(99).  
**Site:** Agri. Res. Stn., Umrala.  
**Type:** ‘I’.

Object:—To find out the optimum number of irrigations for Wheat.
1. **BASAL CONDITIONS**:

(i) (a) Nil. (b) Sann for G.M. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umra. (iii) 5.11.1959. (iv) (a) Nil. (b) Drilling. (c) 60 lb/ac. (d) 9' between rows. (e) —. (v) Sann G.M. (vi) N.P. 718. (vii) As per treatments. (viii) Nil. (ix) 25.9° (during the whole year). (x) 11.3.1960.

2. **TREATMENTS**:

3 levels of irrigation: I₁=5, I₂=7 and I₃=9 irrigations.

3. **DESIGN**:

(i) R.B.D. (ii) 3. (b) N.A. (iii) 6. (iv) (a) 18'×30'. (b) 15'×27'. (v) 1.5'×1.5'. (vi) Yes.

4. **GENERAL**:

(i) Good. (ii) Nil. (iii) Grain yield. (iv) 1956—contd. (not conducted in 1958). (b) No. (c) Nil. (d) and (e) N.A. (vi) and (vii) Nil.

5. **RESULTS**:

(i) 1636 lb/ac. (ii) 121.6 lb/ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1549</td>
<td>1631</td>
<td>1728</td>
<td></td>
<td>1026</td>
<td>49.67 lb/ac.</td>
</tr>
</tbody>
</table>

Crop: **Wheat** (Rabi).  
Site: **Agri. Res. Stn., Halvad**.  
Type: **IIC**.  
Ref: **Gj. 57(30)**.

Object: To find out a suitable interval of irrigation and plot size for Wheat in canal area.

1. **BASAL CONDITIONS**:

(i) (a) Nil. (b) Sann G.M. (c) 200 lb/ac. of Super. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 6.11.1957. (iv) (a) Ploughing, harrowing and cultivation by drill. (b) to (e) N.A. (v) 200 lb/ac. of single super incorporated in soil before soaking dose, 200 lb/ac. of manure mixture, 200 lb/ac. of A/S and 200 lb/ac. of castor cake. Broadcast before sowing. (vi) N.P. 710. (vii) As per treatments. (viii) Weeding. (ix) Nil. (x) N.A.

2. **TREATMENTS**:

Main-plot treatments:  
2 sizes of plot (gross): S₁=1 guntha, S₂=2 gunthas.

Sub-plot treatments:  
3 levels of irrigation: I₁=7 irrigations at 14 day’s interval, I₂=5 irrigations at 21 day’s interval and I₃=3 irrigations at 28 day’s interval.

3. **DESIGN**:

(i) Split-plot design. (ii) (a) 2 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) According to treatments. (b) 363 Sq. ft. (v) N.A. (vi) Yes.

4. **GENERAL**:

(i) Satisfactory. (ii) Nil. (iii) Height of plant, no. of earheads, length of earheads and no. of spikes. (iv) (a) 1957—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:

(i) 1712 lb/ac. (ii) (a) 288.7 lb/ac. (b) 175.6 lb/ac. (iii) Main effect of I is highly significant. Others are not significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>1762</td>
<td>1754</td>
<td>1391</td>
<td>1636</td>
</tr>
<tr>
<td>S₂</td>
<td>2000</td>
<td>1799</td>
<td>1568</td>
<td>1789</td>
</tr>
<tr>
<td>Mean</td>
<td>1881</td>
<td>1777</td>
<td>1480</td>
<td>1712</td>
</tr>
</tbody>
</table>
Object: To find out a suitable plot size and a proper interval of irrigation for Wheat.

1. BASAL CONDITIONS:
   (a) Nil. (b) Sann. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 27 and 28.11.1958. (iv) (a) One ploughing, 2 harrowings. (b) Drilling. (c) 60 lb./ac. (d) 9" between rows. (e) —
   (v) 100 lb./ac. of A/S+100 lb./ac. of manure mixture broadcast and 54 lb./ac. of P2O5 drilled on 11.11.1958. (vi) N.P. 710. (vii) As per treatments. (viii) One interculturing. (ix) N.A. (x) 21.3.1959.

2. TREATMENTS:
   Main-plot treatments:
   2 sizes of plot (gross) : S1 = 1 guntha and S2 = 2 gunthas.
   Sub-plot treatments:
   3 intervals of irrigation : I1 = 14, I2 = 21 and I3 = 28 days.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) S1 = 54" x 20" and S2 = 108" x 20". (b) S1 = 44" x 8.25" and S2 = 98" x 8.25". (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) A and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1381 lb./ac. (ii) (a) 236.4 lb./ac. (b) 127.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>I1</th>
<th>I2</th>
<th>I3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>1439</td>
<td>1351</td>
<td>1342</td>
<td>1377</td>
</tr>
<tr>
<td>S2</td>
<td>1455</td>
<td>1400</td>
<td>1301</td>
<td>1385</td>
</tr>
</tbody>
</table>

Mean = 1381

S.E. of difference of two
   1. S marginal means = 96.5 lb./ac.
   2. I marginal means = 63.8 lb./ac.
   3. I means at the same level of S = 90.1 lb./ac.
   4. S means at the same level of I = 121.4 lb./ac.
1. BASAL CONDITIONS:
(i) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 20.11.1955.
(iv) (a) One ploughing, 2 harrowings. (b) Dibbling. (c) —. (d) As per treatments. (e) 2-3 seeds/dibble.
(v) 30 lb./ac. of N+18 lb.jac. of P2O5. (vi) Kenphad—28. (vii) As per treatments. (viii) One weeding.
(ix) N.A. (x) 30, 31.3.1956.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 spacings : S1=3 way sowing, S2=9” between rows and S3=12”×4”.
(2) 3 intervals of irrigation : I1=6 irrigations at 15 days interval, I2=5 irrigations at 20 days interval and I3=4 irrigations at 25 days interval.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) (a) 30’×18’. (b) 24’×12’. (v) 3’×3’. (vi) Yes.

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

5. RESULTS:
(i) 975 lb./ac. (ii) 94.83 lb./ac. (iii) Main effects of S and I are highly significant. Interaction S×I
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>
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<tbody>
<tr>
<td>I1</td>
<td>1127</td>
<td>1289</td>
<td>862</td>
<td>1093</td>
</tr>
<tr>
<td>I2</td>
<td>1044</td>
<td>1060</td>
<td>774</td>
<td>959</td>
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<td>I3</td>
<td>1013</td>
<td>954</td>
<td>651</td>
<td>873</td>
</tr>
<tr>
<td>Mean</td>
<td>1061</td>
<td>1101</td>
<td>762</td>
<td>975</td>
</tr>
</tbody>
</table>

S.E. of marginal mean =24.48 lb./ac.
S.E. of body of table =42.41 lb./ac.

Crop :- Wheat (Rabi).
Site :- Paliyad.

Ref :- Gj. 54(T.C.M.).
Type :- ‘IM’.
Object :- Type VII—To study the effects of N and P2O5 along with different intensities of irrigation on Wheat

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) N.A. (iii) N.A. (iv) Medium black soils of trap and gneissic origin. (v) Irrigated.
(vi) N.A. (vii) N.P. 715. (viii) and (ix) N.A. (x) End of March.

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 P2O5 as Super : P0 =0, P1 =20 and P2 =40 lb./ac.
(3) 3 levels of irrigation : I1 =7, I2 =8 and I3 =9 irrigations. Super ploughed into the soil while A/S broadcast just before sowing.

3. DESIGN:
(i) 3² Fact. confd. (ii) (a) 3 blocks/replication ; 9 plots/block. (iii) 1. (iv) (a) 36’×15’. (b) 33’×12’. (v) 1.5’×1.5’. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) 1954—1955. (b) No. (c) Nil. (v) N.A. (vi) and
(vii) Nil.

5. RESULTS:
(i) 1847 lb./ac. (ii) 196.5 lb./ac. (iii) Only N effect is significant. (iv) Av. yield of grain in lb./ac.
Crop :- Wheat \((Rabi)\).
Site :- Paliyad.

Object :- Type VII—To study the effect of \(N\) and \(P_2O_5\) along with different intensities of irrigation on Wheat.

1. BASAL CONDITIONS to 4. GENERAL:
   Same as in expt. no. 54(TCM) on page 133.

5. RESULTS:
   (i) 1636 lb./ac. (ii) 228.6 lb./ac. (iii) None of the effects is 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>(I_1)</th>
<th>(I_2)</th>
<th>(I_3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(P_0)</td>
<td>1348</td>
<td>1530</td>
<td>1541</td>
<td>1473</td>
<td>1384</td>
<td>1546</td>
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<tr>
<td>(P_1)</td>
<td>1507</td>
<td>1817</td>
<td>1777</td>
<td>1700</td>
<td>1576</td>
<td>1716</td>
</tr>
<tr>
<td>(P_2)</td>
<td>1617</td>
<td>1757</td>
<td>1827</td>
<td>1734</td>
<td>1788</td>
<td>1582</td>
</tr>
<tr>
<td>Mean</td>
<td>1491</td>
<td>1701</td>
<td>1715</td>
<td>1636</td>
<td>1583</td>
<td>1614</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 76.2 lb./ac.
S.E. of body of any table = 132.0 lb./ac.

Crop :- Wheat.

Object :- To study the effect of hormone treatment on Wheat yield.

1. BASAL CONDITIONS:
   (i) (a) Wheat after gram. (b) Gram. (c) Nil. (ii) (a) Medium black to deep black. (b) Refer soil analysis, Arnej. (iii) 24.10.1954. (iv) (a) Four harrowings prior to sowing. (b) to (c) N.A. (v) Nil. (vi) A-206 (medium). (vii) Unirrigated. (viii) Weeding. (ix) 24.10. (x) 17.3.1955.
2. TREATMENTS:
Wheat seed treated with 2-4 D as
1. 0.01 P.P.M. for 30 minutes.
2. 0.10 P.P.M. for 30 minutes.
3. 1.00 P.P.M. for 30 minutes.
4. 0.01 P.P.M. for 20 minutes.
5. 0.10 P.P.M. for 20 minutes.
6. 1.00 P.P.M. for 20 minutes.
7. Untreated dry seed.

3. DESIGN:
(i) R.B.D. (ii) 7. (iii) 4. (iv) (a) 36’×18’. (b) 30’×12’. (v) 3’×3’. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—54. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 721 lb./ac. (ii) 104.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Crop: Jowar (Rabi).
Ref: Gj. 54(22).
Type: ‘M’.

Object i—To study the effect of the leguminous crop (Chinanug) raised with and without P₂O₅ on succeeding Rabi Jowar.

1. BASEAL CONDITIONS:
(i) (a) Chinamug—Jowar. (b) Chinamug. (c) As per treatments. (ii) (a) Medium black. (b) N.A. (iii) 15.10.1954. (iv) (a) N.A. (b) Drilling. (c) 6 lb./ac. (d) Between rows 24” apart. (e) N.A. (v) Nil. (vi) Jowar No. 8. (vii) Unirrigated. (viii) One thinning and one interculturing. (ix) 0.4”. (x) 20.2.1955.

2. TREATMENTS:
1. 0 lb./ac. of P₂O₅ as Super.
2. 50 lb./ac. of P₂O₅ as Super.
3. 100 lb./ac. of P₂O₅ as Super.
4. 150 lb./ac. of P₂O₅ as Super.
5. Fallow in Khari and sown in Rabi. Manured with 10 C.L./ac. of F.Y.M. Manures applied to the previous crop Chinamug.

3. DESIGN:
(i) R.B.D. (ii) 5. (b) N.A. (iii) 5. (iv) (a) 48’×30’. (b) 36’×18’. (v) 6’×6’. (vi) Yes.

4. GENERAL:
(i) Growth quite even and healthy. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1948 (Khari) to 1954 (Rabi). (b) No. (c) Nil. (v) (a) Mohol. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1258 lb./ac. (ii) 706.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment 1 2 3 4 5
Av. yield 1177 1075 1224 1356 1427
S.E./mean = 137.1 lb./ac.
Crop: Jowar (Rabi).


Ref: Gj. 54(26).

Type: 'M'.

Object: To study the usefulness of chinamug as a G.M. for succeeding Rabi Jowar.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) Manure mixture at 80 lb./ac. (ii) (a) Black cotton soil. (b) N.A. (iii) Chinamug on 7.7.1955; Jowar on 16.10.1955. (iv) (a) N.A. (b) Drilling. (c) 1 lb./ac. for chinamug and 6 lb./ac. for jowar. (d) N.A. (e) N.A. (f) Nil. (g) Unirrigated. (h) 2 interculturings, 1 weeding and 1 thinning. (i) 44.82'. (j) 19.8.1954 for chinamug and 23.2.1955 for jowar.

2. TREATMENTS:
   1. Chinamug in kharif and buried in situ.
   2. Chinamug in kharif and buried in treatment 3.
   3. No Chinamug in kharif but buried from treatment 2.

3. DESIGN:
   (i) R.B.D. (ii) 3. (b) N.A. (iii) 2. (iv) (a) 90'×12'. (b) 86'×8'. (v) 2' around. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1955. (b) 1955 to 1956. (c) Nil. (d) a and (e) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1122 lb./ac. (ii) 90.50 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1124</td>
<td>1094</td>
<td>1147</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>64.20 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Crop: Jowar (Rabi).


Ref: Gj. 55(12).

Type: 'M'.

Object: To study the usefulness of chinamug as G.M. for succeeding Rabi Jowar.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) Manure mixture at 80 lb./ac. (ii) (a) Black cotton soil. (b) N.A. (iii) Chinamug on 7.7.1955; Jowar on 16.10.1955. (iv) (a) N.A. (b) Drilling. (c) 1 lb./ac. for chinamug and 6 lb./ac. for jowar. (d) N.A. (e) N.A. (f) Nil. (g) Jowar No. 8. (h) Unirrigated. (i) Jowar No. 8. (j) 1 thining, 2 interculturings and 1 weeding. (k) 31.65'. (l) Chinamug on 16.9.1955 and Jowar on 4.3.1956.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 54(26) above.

4. GENERAL:
   (i) Unsatisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1955. (b) 1955 to 1956. (c) Nil. (d) a and (e) N.A. (v) Jowar No. 8. (vi) and (vii) Nil.

5. RESULTS:
   (i) 770.0 lb./ac. (ii) 94.02 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>797</td>
<td>831</td>
<td>682</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>66.5 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Jowar (Rabi).

Object: To study the usefulness of sann as G.M. for succeeding Rabi Jowar.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) TIl. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.6.1954 for sannhemp; 23.9.1954 for jowar. (iv) (a) N.A. (b) Drilling. (c) 40 lb./ac. for sann, 6 lb./ac. for jowar. (d) 2' between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 2 interculturings and 1 weeding. (ix) 44.82'. (x) 18.8.1954 for sannhemp; 23.2.1955 for jowar.

2. TREATMENTS:
   1. Sann grown for G.M. buried in situ.
   2. Sann grown for G.M. and cut for burying in treatment 3.
   3. Buried stripped leaves and tender shoots from treatment 2.
   4. No manure.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) 90'x12'. (b) 86'x8'. (v) 2' around. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1574 lb./ac. (ii) 128.8 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.
   Treatment
   1  2  3  4
   Av. yield 1672 1519 1557 1549
   S.E./mean = 91.1 lb./ac.

---

Crop: Jowar (Rabi).

Object: To study the usefulness of sann as G.M. for succeeding Rabi Jowar.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) Manure mixture at 80 lb./ac. (ii) (a) Black cotton soil. (b) N.A. (iii) 7.7.1955 for sannhemp and 16.10.1955 for jowar. (iv) (a) N.A. (b) Drilling. (c) 40 lb./ac. for sann, 6 lb./ac. for jowar. (d) 2'x4'. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 1 thinning and 2 interculturings. (ix) 31.65'. (x) 18.9.1955 for sannhemp and 4.3.1956 for jowar.

2. TREATMENTS and 3. DESIGN
   Same as in expt. no. 54(24) above.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 925 lb./ac. (ii) 97.37 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.
   Treatment
   1  2  3  4
   Av. yield 973 817 993 918
   S.E./mean = 68.85 lb./ac.
Crop: Jowar (Rabi).

Object: To study the effect of various micro-nutrients on Jowar crop.

1. BASAL CONDITIONS:
   (i) (a) Jowar—Cotton. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 23.10.1956. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) 24" between rows. (e) N.A. (v) 20 lb./ac. of N as A/S at sowing & 20 lb./ac. of P₂O₅ as Super. (vi) Jowar No. 8. (vii) Unirrigated. (viii) 1 thinning and 2 interculturings. (ix) 20.83". (x) 30.1.1958 and 31.1.1958.

   2. TREATMENTS:
      All combinations of (1), (2), (3), (4) and (5):
      1. 2 levels of Zinc as ZnSO₄: A₀=0 and A₁=ZnSO₄ at 9 lb.+Lime at 2 lb.+100 gallons of water.
      2. 2 levels of Manganese as MnSO₄: B₀=0, B₁=MnSO₄ at 3 lb.+Lime at 8 lb.+100 gallons of water.
      3. 2 levels of Copper as CuSO₄: C₀=0, C₁=CuSO₄ at 8 lb.+Lime at 8 lb.+100 gallons of water.
      4. 2 levels of Molybdenum as Sodium Molybdate+CaCO₃: D₀=0 and D₁=Sodium Molybdate at 3 ozs.+100 gallons of water.
      5. 2 levels of Boron as Borax: E₀=0 and E₁=Borax at 0.5 lb.+Bentonite at 0.5 lb.+100 gallons of water.

   Total quantity of foliar spray is 130 gallons/ac. All sprays contain 31 pints of Tenal (Burmah-Shell) per 100 gallons as spreader and sicker.

   DESIGN:
   (i) 25 Fact. in R.B.D. (ii) (a) 32. (b) 96' x 192'. (iii) 4. (iv) (a) 24' x 24'. (b) 16' x 16'. (v) 4' around. (vi) Yes.

4. GENERAL:
   (i) Due to late and excessive rains growth was stunted and unsatisfactory. (ii) Lavalia infection affected the crop. Grass hoppers and stem borer attack. (iii) Grain and fodder yield. (iv) a, 1956—1958. (b) No. (c) Nil. (v) and (vi) Nil.

5. RESULTS:
   (i) 628.5 lb./ac. (ii) 247.2 lb./ac. (iii) Note of the effects is significant. (iv) Table of mean and differential responses of grain in lb./ac.

<table>
<thead>
<tr>
<th>Differential response</th>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-8.4</td>
<td>9.9</td>
<td>14.3</td>
<td>21.4</td>
<td>32.6</td>
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<tr>
<td></td>
<td></td>
<td>-28.2</td>
<td>-12.2</td>
<td>-42.4</td>
<td>-97.0</td>
<td>40.5</td>
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<td></td>
<td></td>
<td>-56.4</td>
<td>-40.3</td>
<td>-64.9</td>
<td>-47.8</td>
<td>-27.1</td>
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<td>-14.3</td>
<td>-38.1</td>
<td>-54.4</td>
<td>-22.9</td>
<td>-60.6</td>
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<td></td>
<td></td>
<td>-68.8</td>
<td>-93.0</td>
<td>-19.2</td>
<td>-39.5</td>
<td>-115.1</td>
</tr>
</tbody>
</table>

S.E. of mean response =43.7 lb./ac. S.E. of differential response =61.8 lb./ac.
3. TREATMENTS and 3. DESIGN:

Same as in expt. no. 56(13) on page 138.

4. GENERAL:

(i) Growth satisfactory, rains irregular and scanty. (ii) Moderate damage due to *lavala* infection. (iii) Grain and fodder yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

3. RESULTS:

(i) 729 lb./ac. (ii) 127.2 lb./ac. (iii) Intraction BxC alone is significant, (iv) Table of mean and differential responses of grain in lb./ac.

### Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zn</td>
<td>-4.5</td>
<td>-</td>
<td>-3.0</td>
<td>-5.9</td>
<td>-</td>
</tr>
<tr>
<td>Mn</td>
<td>26.1</td>
<td>27.5</td>
<td>24.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cu</td>
<td>-3.6</td>
<td>-</td>
<td>41.0</td>
<td>-48.3</td>
<td>-</td>
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<tr>
<td>Mo</td>
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<td>3.2</td>
<td>-47.0</td>
<td>56.5</td>
<td>-</td>
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<tr>
<td>B</td>
<td>15.8</td>
<td>-17.3</td>
<td>49.0</td>
<td>20.6</td>
<td>11.1</td>
</tr>
</tbody>
</table>

S.E. of mean response = 22.5 lb./ac.  
S.E. of differential response = 31.8 lb./ac.

Crop: Jowar (Rabi).  
Object: To study the effect of various micro-nutrients on Jowar crop.

### BASAL CONDITIONS:


2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 56(13) on page 138.

4. GENERAL:

(i) Rains irregular and scanty, growth satisfactory. (ii) Moderate damage due to *lavala* infection. (iii) Grain and fodder yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

3. RESULTS:

(i) 958 lb./ac. (ii) 212.3 lb./ac. (iii) Only C effect is highly significant. (iv) Table of mean and differential responses of grain in lb./ac.

### Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zn</td>
<td>16</td>
<td>-</td>
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<td>-32</td>
<td>26</td>
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<tr>
<td>Mn</td>
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<td>-46</td>
<td></td>
<td>46</td>
</tr>
<tr>
<td>Cu</td>
<td>-119</td>
<td>-109</td>
<td>-129</td>
<td>-76</td>
<td>-163</td>
</tr>
<tr>
<td>Mo</td>
<td>-40</td>
<td>-46</td>
<td>-33</td>
<td>20</td>
<td>-59</td>
</tr>
<tr>
<td>B</td>
<td>39</td>
<td>82</td>
<td>-3</td>
<td>62</td>
<td>15</td>
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</tbody>
</table>

S.E. of mean response = 37.5 lb./ac.  
S.E. of differential response = 53.1 lb./ac.
Crop: Jowar (Kharif).

**Object:** To find out suitable time and method of application of A/S to Jowar.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Coarse sandy loam. (b) Refer soil analysis, Deesa. (iii) 20.8.1956. (iv) a. Drilling with four coulted drill. (b) N.A. (c) 16 lb./ac. (d) Rows—12' apart. (e) N.A. (v) 3 C.L. ac. of F.Y.M. broadcast 15 days before sowing. (vi) Malvan (local). (vii) Unirrigated. (viii) One weeding and one intercutting. (ix) 35.39'. (x) 25.11.1956.

2. **TREATMENTS:**
40 lb./ac. of N as A/S applied as follows:
1. Whole dose broadcast at sowing.
2. 1/2 dose at sowing (broadcast) + 1/2 dose one month after sowing.
3. Whole dose drilled at sowing.
4. 1/2 dose drilled at sowing + 1/2 dose drilled in one month after sowing.
5. Whole dose broadcast 15 days prior to sowing.

3. **DESIGN**:
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 5. (iv) (a) 36'×18'. (b) 39'×12'. (v) 3' all round. (vi) Yes.

4. **GENERAL:**
   (i) Normal. (ii) There was some attack of birds. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) a. Surat and Talod. (b) Nil. (vi) and (vii) Nil.

5. **RESULTS**
(i) 625 lb./ac. (ii) 149.7 lb./ac. (iii) The treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th>Treatment</th>
<th>1</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>513</td>
<td>568</td>
<td>571</td>
<td>744</td>
<td>730</td>
</tr>
<tr>
<td>S.E./mean=66.9 lb./ac.</td>
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</tbody>
</table>

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Crop: Jowar (Kharif).

**Object:** To find out suitable time and method of application of A/S to Jowar.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Jowar fodder. (c) Nil. (ii) (a) Yellowish brown. (b) Refer soil analysis, Deesa. (iii) 25.7.1957. (iv) (a) Two ploughings. (b) Drilling with four coulted drill. (c) 16 lb./ac. (d) Rows 12' apart. (e) —. (v) 3 C.L. ac. of F.Y.M. broadcast 15 days before sowing. (vi) Malvan (local). (vii) Unirrigated. (viii) Grass harrowing and one intercutting. (ix) 14.57'. (x) 12 to 14.12.1957.

2. **TREATMENTS and DESIGN**
   Same as in exp. no. 56(20) above.

3. **GENERAL:**
   (i) The germination was slightly defective. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) a. Talod, Surat. (b) Nil. (vi) and (vii) Nil.

4. **RESULTS**
(i) 229 lb./ac. (ii) 94.0 lb./ac. (iii) The treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

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<th>Treatment</th>
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<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>184</td>
<td>293</td>
<td>174</td>
<td>242</td>
<td>253</td>
</tr>
<tr>
<td>S.E./mean=42.0 lb./ac.</td>
<td></td>
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</tr>
</tbody>
</table>
Crop: Jowar (Kharif).

Object: To find out suitable period and method of application of A/S to Jowar.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Castor. (c) Nil. (ii) (a) Yellowish brown. (b) Refer soil analysis, Deesa. (iii) 23.8.1958. (iv) (a) 3 ploughings and 2 harrowings. (b) Drilling. (c) 16 lb./ac. (d) 12" between rows. (e) (v) 3 C.L./ac. of F.Y.M.+20 lb./ac. of P4O5 as Super. (vi) Mahan (local). (vii) Unirrigated. (viii) 2 interculturings. (ix) 14.1°. (x) 8.12.1958.

2. TREATMENTS and DESIGN:
   Same as in exp. no. 56(20) on page 140.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) Talod and Surat. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 955 lb./ac. (ii) 86.5 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

   Treatment  | 1  | 2  | 3  | 4  | 5
   Av. yield  | 934| 920| 961| 1042| 915
   S.E./mean  = 38.7 lb./ac.

Crop: Jowar.

Object: To find the suitable time and method of application of A/S to Jowar.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 29.7.1955. (iv) (a) N.A. (b) Drilled. (c) 8 lb./ac. (d) 3'X1'. (e) (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P4O5 as B.M. (vi) B.P.-53. (vii) Unirrigated. (viii) 2 thinnings, 1 wedding and 3 interculturings. (ix) 27'. (x) 27.1.1956.

2. TREATMENTS:
   40 lb./ac. of N as A/S applied as
   1. Whole dose broadcast at sowing.
   2. ½ dose broadcasted at sowing and ½ after one month of sowing.
   3. Whole dose drilled at sowing.
   4. ½ dose drilled at sowing and ½ drilled one month after sowing.
   5. Whole dose broadcast 15 days before sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 36'X21'. (b) 30'X15'. (v) 3' around. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1555—contd. (b) No. (c) N.A. (v) (a) Deesa and Talod. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1472 lb./ac. (ii) 197.4 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

   Treatment  | 1  | 2  | 3  | 4  | 5
   Av. yield  | 1545| 1525| 1465| 1395| 1420
   S.E./mean  = 88.2 lb./ac.
Crop: Jowar.  
Ref: Gj. 56(55).  
Type: 'M'.

Object: To find out the suitable time and method of application of A/S to Jowar.

1. BASAL CONDITIONS:
   (i) (a) Cotton-Jowar, (b) Cotton, (c) Nil. (ii) Black cotton soil. (iii) 16.8.1956. (iv) (a) N.A. (b) Drilled. (c) 8 lb./ac. (d) 3'x1'. (e) N.A. (v) 5 C.L./ac. of F.Y.M +20 lb./ac. of P_{2}O_{5} as B.M. (vi) B.P.-53. (vii) Unirrigated. (viii) 2 seed dressing and 3 intercultivations. (ix) 41.74. (x) 13.1.1957.

2. TREATMENTS and DESIGN:
   Same as in exp. no. 56(22), on page 140.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955-56. (b) Nil. (c) Nil. (v) (a) Dhosa and Talod. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 247 lb./ac. (ii) 20.5 lb./ac. (iii) Treatments differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2362</td>
<td>2587</td>
<td>2542</td>
<td>2667</td>
</tr>
</tbody>
</table>

S.E./mean = 90.5 lb./ac.

Crop: Jowar (Kharif).  
Ref: Gj. 57(63).  
Type: 'M'.

Object: To know the suitable time and method of application of A/S to Jowar.

1. BASAL CONDITIONS:
   (i) (a) Jowar-Cotton. (b) Cotton. (c) Nil. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Surat. (iii) 17.8.1957. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) 3'x1'. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) B.P.-53. (vii) Irrigated. (viii) 2 interculturings, 1 weeding and 1 thinning. (iv) 32.41%. (x) 22.2.1958.

2. TREATMENTS and DESIGN: Same as in exp. no. 56(20), on page 140.

4. GENERAL:
   (i) Crop suffered due to lack of rainfall from 2nd September onward. After irrigation the crop reached its normal growth. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

3. RESULTS:
   (i) 510 lb./ac. (ii) 51.93 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th>Treatment</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>525</td>
<td>435</td>
<td>539</td>
<td>532</td>
</tr>
</tbody>
</table>

S.E./mean = 23.2 lb./ac.

Crop: Jowar (Kharif).  
Ref: Gj. 58(46).  
Type: 'M'.

Object: To study the suitable time and method of application of A/S to Jowar.
1. **BASAL CONDITIONS:**

(i) (a) *Jowar* — Cotton. (b) Cotton. (c) Nil. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Surat. 

(iii) 4.8.1958. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) 3′x1′. (e) N.A. (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P₂O₅ at the time of sowing. (vi) B.P. 53. (vii) Unirrigated. (viii) 5 interculturings, 1 weeding and 2 thinnings. 

(x) 44.81°. (x) 27.2.1959, 7.3.1959.

2. **TREATMENTS** to 3. **DESIGN:**

Same as in expt. no. 55 (47) on page 140.

3. **GENERAL:**

(i) Growth stunted in the early stage but later grew vigorously and was normal by harvesting time. 

(ii) Nil. (iii) Grain and fodder yield. 

(iv) (a) 1955—contd. (b) No. (c) Nil. (vi) (a) and (b) N.A. 

(vii) Nil. (vi) B.P.—53. (vii) Unirrigated. (viii) 3 interculturings and 2 weedings. (ix) 44.81°. 

(x) 4.3.1960.

4. **RESULTS:**

(i) 550 lb./ac. (ii) 65.3 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac. 

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>534</td>
<td>507</td>
<td>565</td>
<td>524</td>
<td>618</td>
</tr>
</tbody>
</table>

S.E./mean = 29.2 lb./ac.

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**Crop:** *Jowar* (*Kharif*).  
**Site:** Agri. Res. Stn., Surat.  
**Ref:** Gj. 59(29).  
**Type:** ‘M’.

Object — To study the residual effect of organic manures and fertilizers applied to previous crop of cotton on *Jowar*.

1. **BASAL CONDITIONS:**

(i) (a) Cotton — *Jowar*. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. 

(iii) 14.8.1959. (iv) (a) Nil. (b) Dibbling. (c) 8 to 10 lb./ac. (d) 3′x1′. (e)—. (v) Nil. (vi) B.P.—53. (vii) Unirrigated. (viii) 3 interculturings and 2 weedings. (iv) 7.7°F. 

(x) 4.3.1960.

2. **TREATMENTS**:

1. Control (no manure)

2. Bulky manure (usual dose of F.Y.M. i.e. 5 C.L./ac. F.Y.M.).


4. N,P,K fertilizers equivalent to usual dose of F.Y.M.

5. N,P,K fertilizers equivalent to half the usual dose of F.Y.M.

6. Bulky manure (usual dose)+N,P,K fertilizers equivalent to usual dose of F.Y.M.

7. Bulky manure (half of usual dose of F.Y.M.)+N,P,K fertilizers equivalent to half the usual dose of F.Y.M.

8. Recommended dose of N and P (i.e. 40 lb./ac. of N+20 lb./ac. of P₂O₅)+N,P,K fertilizers equivalent to usual dose of F.Y.M.

9. Half of the dose in treatment no. 8. These manure and fertilizers were applied to previous cotton crop.

3. **DESIGN:**

(i) R.B.D. (ii) (a) 9. (b) 108′x75′. (iii) 4. (iv) (a) 36′x25′. (b) 24′x15′. (v) 6′x5′. (vi) Yes.

4. **GENERAL:**

(i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1959—contd. (b) Yes. (c) Nil. (v) (a) (b) N.A. (vi) Nil. (vii) First year of the residual effect.

5. **RESULTS:**

(i) 1025 lb./ac. (ii) 124.1 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain 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>Av. yield</td>
<td>1010</td>
<td>1033</td>
<td>991</td>
<td>972</td>
<td>1063</td>
<td>1074</td>
<td>1085</td>
<td>1015</td>
<td>583</td>
</tr>
</tbody>
</table>

S.E./mean = 62.1 lb./ac.
Crop :- Jowar.  
Ref :- Gj. 54(65).  
Type :- 'M'.

Object :- To study the residual effect of previous Tur crop raised with or without P<sub>2</sub>O<sub>5</sub> on succeeding crop Jowar.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar. (b) Cotton and Tur. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 22.8.1954. (iv) (a) Three harrowings as preparatory tillage. (b) Drilling. (c) 10 lb./ac. (d) 2'×1'. (e) —. (v) Nil. (vi) B.P.—53. (vii) Unirrigated. (viii) Oas thinning, 1 weeding and 2 interculturings. (ix) 81.54°. (x) 17.2.1955.

2. TREATMENTS:
   1. No P<sub>2</sub>O<sub>5</sub> as in previous year.
   2. 50 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super in previous year.
   3. 100 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super in previous year.
   4. 150 lb./ac. of P<sub>2</sub>O<sub>5</sub> as Super in previous year.
   5. Cotton sugog in previous year.

3. DESIGN:
   (i) 3. Sq.
   (ii) 5.
   (iii) 5.
   (iv) (a) 42'×33'. (b) 33'×18'. (v) 6' around. (vi) Yes.

4. GENERAL:
   (i) Crop suffered due to heavy rainfall. 
   (ii) N. (iii) Physical height, number of stand and weight of kadhi. 
   (iv) (a) 1949 to 1954. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Abnormal season.

5. RESULTS:
   (i) 628 lb./ac. (ii) 102.4 lb./ac. (iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>653</td>
<td>737</td>
<td>568</td>
<td>713</td>
<td>472</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=46.0 lb./ac.</td>
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Crop :- Jowar (Kharif).  
Ref :- Gj. 54(61).  
Type :- 'M'.

Object :- To find out the optimum dose of N, P and F.Y.M. for Jowar.

1. BASAL CONDITIONS:
   (i) (a) Jowar—Cotton. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 23.8.1954. (iv) (a) Three harrowings. (b) Drilling. (c) 10 lb./ac. (d) 3'×1'. (e) N.A. (f) Nil. (g) B.P.—53 [late]. (h) Unirrigated. (i) 4 interculturings, 1 weeding and 1 thinning. (ii) 81.54°. (iii) 11.2.1955.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N : N₁=40, N₂=60 and N₃=80 lb./ac.
   (2) 2 levels of P<sub>2</sub>O<sub>5</sub> : P₁=23 and P₂=10 lb./ac.
   (3) 2 levels of F.Y.M. : F₁=5 and F₂=10 C.L.ac.

3. DESIGN:
   (i) 3 × 2² Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 42'×18'. (b) 30'×12'. (v) 6'×3'. (vi) Yes.

4. GENERAL:
   (i) Due to continuous rainfall Jowar growth was checked for want of vapta conditions of soil. No lodging. 
   (ii) Attack of stem-borer. (iii) Grain and fodder yield. (iv) (a) 1948 to 1954 (modified in 1952). (b) Two sets of plots for the same experiment were kept. Hence treatments assigned to same plots in alternate years. (c) Nil. (d) (a) and (b) N.A. (d) and (vii) Nil.

5. RESULTS:
   (i) 1784 lb./ac. (ii) 159.5 lb./ac. (iii) Only N and P effects are highly significant. (iv) Av. yield of grain in lb./ac.
Object: To see whether Calcium cyanide could replace A/S for Jowar.

1. BASAL CONDITIONS:
(i) (a) Cotton—Jowar. (b) Cotton. (c) Nil. (ii) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 20.8.1954. (iv) (a) Two harrowings. (b) Drilling. (c) 10 lb./ac. (d) 3' x 1'. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) B.P.—53 (late). (vii) Unirrigated. (viii) One thinning, 1 weeding and 2 interculturings. (ix) 81.54". (x) 16.2.1955.

2. TREATMENTS:
4 sources of 60 lb./ac. of N: S1 = A/S, S2 = A/S and G.N.C. in 1 : 1 ratio, S3 = Calcium cyanide and S4 = G.N.C. and Calcium cyanide in 1 : 1 ratio.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) 74' x 30'. (b) 62' x 18'. (v) 6' all around. (vi) Yes.

4. GENERAL:
(i) Below normal. (ii) Attack of stem-borer to about 30%. There were also some patches of striga in some of the plots. (iii) Height, grain and kadbi yield. (iv) (a) 1952 to 1954. (b) Only in alternate years. (c) Nil. (v) (a) and (b) N.A. (vi) Season was abnormal. (vii) Nil.

5. RESULTS:
(i) 1056 lb./ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>1068</td>
<td>1207</td>
<td>1032</td>
<td>918</td>
</tr>
</tbody>
</table>

S.E./mean = N.A.

1. **BASAL CONDITIONS**:
   (i) (a) Jowar—Cotton. (b) Cotton. (c) 5 C.L./ac. of F.Y.M.+10 lb./ac. of N as A/S. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Surat. (iii) 29.7.1957. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) 3'×1'. (e) N.A. (v) Nil. (vi) Jowar B.P.—53. (vii) Unirrigated. (viii) 1 thinning, 1 weeding and 2 interculturings. (ix) 33.41'. (x) 5.2.1958.

2. **TREATMENTS**: All combinations of (1), (2), (3) and (4)
   (1) 3 levels of N as A/S, N0 = 0, N1 = 30 and N2 = 60 lb./ac.
   (2) 3 levels of P2O5 : P0 = 0, P1 = 30 and P2 = 60 lb./ac.
   (3) 3 levels of K2O : K0 = 0, K1 = 30 and K2 = 60 lb./ac.
   (4) 3 levels of F.Y.M. : F0 = 0, F1 = 2½ and F2 = 5 lb./ac.

3. **DESIGN**:
   (i) 34 confd. (ii) (a) 9 plots/block and 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 21'×36'. (b) 15'×30'. (v) 3' alround. (vi) Yes.

4. **GENERAL**:
   (i) Growth was somewhat checked for want of rains and late sowing. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—condt. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   (i) 932 lb./ac. (ii) 149.1 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>F0</th>
<th>F1</th>
<th>F2</th>
<th>K0</th>
<th>K1</th>
<th>K2</th>
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<tbody>
<tr>
<td>P0</td>
<td>796</td>
<td>943</td>
<td>1112</td>
<td>885</td>
<td>963</td>
<td>1004</td>
<td>966</td>
<td>993</td>
<td>893</td>
<td>950</td>
</tr>
<tr>
<td>P1</td>
<td>758</td>
<td>963</td>
<td>965</td>
<td>927</td>
<td>841</td>
<td>919</td>
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<td>895</td>
</tr>
<tr>
<td>P2</td>
<td>854</td>
<td>966</td>
<td>1304</td>
<td>899</td>
<td>1012</td>
<td>943</td>
<td>913</td>
<td>938</td>
<td>1004</td>
<td>951</td>
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<tr>
<td>Mean</td>
<td>803</td>
<td>957</td>
<td>1037</td>
<td>904</td>
<td>939</td>
<td>955</td>
<td>919</td>
<td>946</td>
<td>932</td>
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</tr>
<tr>
<td>K0</td>
<td>769</td>
<td>938</td>
<td>1051</td>
<td>952</td>
<td>896</td>
<td>910</td>
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</tr>
<tr>
<td>K1</td>
<td>824</td>
<td>996</td>
<td>1018</td>
<td>869</td>
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<td>996</td>
<td>880</td>
<td>907</td>
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<td>895</td>
</tr>
<tr>
<td>K2</td>
<td>816</td>
<td>938</td>
<td>1043</td>
<td>891</td>
<td>946</td>
<td>960</td>
<td>913</td>
<td>938</td>
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<td>951</td>
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<tr>
<td>F0</td>
<td>786</td>
<td>921</td>
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<td></td>
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</tr>
<tr>
<td>F1</td>
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<td>1029</td>
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<tr>
<td>F2</td>
<td>835</td>
<td>952</td>
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</tbody>
</table>

S.E. of any marginal mean = 28.7 lb./ac.
S.E. of body of any table = 49.7 lb./ac.

**Crop**: Jowar.
**Site**: Agri. Res. Stn., Surat.
**Ref**: Gj. 58(63).
**Type**: 'M'.

Object:—To see the effect of N, P and K combined with F.Y.M. on yield of Jowar.

1. **BASAL CONDITIONS**:
   (i) (a) Cotton—Jowar (b) Cotton. (c) 20 lb./ac. of N as A/S. (ii) (a) Deep black. (b) Refer soil analysis, Surat. (iii) 4.8.1958. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) 3'×1'. (e) —. (v) Nil. (vi) B.P.—53. (vii) Unirrigated. (viii) 3 interculturings and 2 weedings. (ix) 44.81'. (x) 27.2.1959.
2. TREATMENTS to 3. DESIGN:
Same as in expt. no. 57 (66) on page 144.

4. GENERAL:
(i) Growth satisfactory. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Timely agricultural operations delayed due to continuous rains.

5. RESULTS:
(i) 870 lb./ac. (ii) 131.8 lb./ac. (iii) N effect is highly significant. K and F effects and interaction N×P are significant. No other effect 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>F_0</th>
<th>F_1</th>
<th>F_2</th>
<th>K_0</th>
<th>K_1</th>
<th>K_2</th>
<th>Mean</th>
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<tr>
<td>P_0</td>
<td>861</td>
<td>821</td>
<td>1045</td>
<td>828</td>
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<td>800</td>
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<td>825</td>
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<td>780</td>
<td>849</td>
</tr>
<tr>
<td>P_2</td>
<td>791</td>
<td>910</td>
<td>853</td>
<td>824</td>
<td>864</td>
<td>866</td>
<td>755</td>
<td>911</td>
<td>888</td>
<td>851</td>
</tr>
<tr>
<td>Mean</td>
<td>806</td>
<td>873</td>
<td>930</td>
<td>817</td>
<td>893</td>
<td>899</td>
<td>814</td>
<td>919</td>
<td>876</td>
<td>870</td>
</tr>
<tr>
<td>K_0</td>
<td>765</td>
<td>839</td>
<td>839</td>
<td>773</td>
<td>821</td>
<td>849</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>K_1</td>
<td>842</td>
<td>903</td>
<td>1011</td>
<td>821</td>
<td>979</td>
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<td>939</td>
<td>858</td>
<td>878</td>
<td>893</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>F_0</td>
<td>799</td>
<td>817</td>
<td>865</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F_1</td>
<td>832</td>
<td>896</td>
<td>950</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>907</td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 25.3 lb./ac.
S.E. of body of any table = 45.9 lb./ac.

Crop :- Jowar.
Site :- Agri. Res. Sta., Surat.
Ref :- Gj. 59(75).
Type :- 'M'.

Object :- To see the effect of N, P and K combined with F.Y.M. on yield of Jowar.

1. BASAL CONDITIONS:
(i) (a) Cotton—Jowar. (b) Cotton. (c) 20 lb./ac. of N as A/S. (ii) (a) Deep black. (b) Refer soil analysis, Surat. (iii) 23.9.1959. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) 3'×1'. (e)—. (v) Nil. (vi) B.P.—53. (vii) Unirrigated. (viii) Two weedings and 2 interculturings. (ix) 70.77'. (x) 2.3.1960.

2. TREATMENTS to 3. DESIGN:
Same as in expt. no. 57 (66) on page 144.

4. GENERAL:
(i) Flood water from river Tapti entered the expt. area and the crop was damaged to a certain extent. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1957—contd. (b) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1087 lb./ac. (ii) 169.9 lb./ac. (iii) N effect is highly significant, interaction K×F is significant. While all other effects are not significant. (iv) Av. yield of grain in lb./ac.
Crop: Jowar (Kharij).

Object: To see the effect of different micro-nutrients on yield and growth of Jowar.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Cotton. (c) 20 lb./ac. of N as A/S+G.N.C. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 7.8.1959. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) 3'×1'. (e) —. (v) 100 lb./ac. of A/S+100 lb./ac. of Super at sowing. (vi) B.P.—53. (vii) Unirrigated. (viii) 1 weeding and 3 interculturings. (x) 70.77. (x) 29.2.1960.

2. TREATMENTS:
   Same as in expt. no. 56(13) on page 138.

3. DESIGN:
   (i) 25 Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 18'×30'. (b) 12'×24'. (v) 3' aloud. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1167 lb./ac. (ii) 168.2 lb./ac. (iii) D effect is highly significant. (iv) Table of mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th>Differential response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean response</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
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<td>-</td>
<td>7.10</td>
<td>6.40</td>
<td>-8.86</td>
<td>-0.58</td>
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<tr>
<td></td>
<td>6.57</td>
<td>19.81</td>
<td>3.12</td>
<td>10.12</td>
<td>22.00</td>
</tr>
<tr>
<td></td>
<td>-10.12</td>
<td>23.26</td>
<td>14.31</td>
<td>65.71</td>
<td>14.31</td>
</tr>
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<td></td>
<td>6.57</td>
<td>19.81</td>
<td>3.12</td>
<td>10.12</td>
<td>22.00</td>
</tr>
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<td>-10.12</td>
<td>23.26</td>
<td>14.31</td>
<td>65.71</td>
<td>14.31</td>
</tr>
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<td></td>
<td>6.57</td>
<td>19.81</td>
<td>3.12</td>
<td>10.12</td>
<td>22.00</td>
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<td>-10.12</td>
<td>23.26</td>
<td>14.31</td>
<td>65.71</td>
<td>14.31</td>
</tr>
</tbody>
</table>

S.E. of mean response = 29.8 lb./ac.  
S.E. of differential response = 42.1 lb./ac.
Crop :- Jowar (Kharif).
Site :- Agri. Res. Stn., Talod.

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

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy soil. (b) Refer soil analysis, Talod. (iii) 26.7.1955. (iv) (a) N.A. (b) Drilling. (c) 6 lb./ac. (d) Rows—18" apart. (e) N.A. (v) 5 C.L./ac. of F.Y.M. and 20 lb./ac. of P₂O₅. (vi) Local. (vii) 2 interculturings. (ix) Unirrigated. (x) 7.12.1955.

2. TREATMENTS to 3. DESIGN:
Same as in expt. no. 56(20) on page 140.

4. GENERAL:
(i) The germination and stand was fairly satisfactory but the yield was little affected for want of rain. (ii) Nil. Damage due to seasonal abnormalities of about 5%. (iii) Grain and fodder yield. (iv) (a) 1955 to 1956. (b) No. (c) Nil. (v) (a) Deesa and Surat. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 369 lb./ac. (ii) 116.5 lb./ac. (iii) The treatments differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>376</td>
<td>447</td>
<td>274</td>
<td>468</td>
<td>278</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>—52.1 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Crop :- Jowar (Kharif).
Site :- Agri. Res. Stn., Talod.

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

1. BASAL CONDITIONS :
(i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Sandy soil. (b) Refer soil analysis, Talod. (iii) 22.7.1956. (iv) (a) N.A. (b) Drilling. (c) 6 lb./ac. (d) Rows—18" apart. (e) N.A. (v) 5 C.L./ac. of F.Y.M. and 20 lb./ac. of P₂O₅. (vi) Jowar local. (vii) Unirrigated. (viii) Two interculturings and two weedings. (ix) 32.06'. (x) 18.12.1956.

2. TREATMENTS: to 3. DESIGN:
Same as in expt. no. 56(20) on page 140.

4. GENERAL:
(i) The germination was defective. The stand was gappy and slight attack of stemborer. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—1956. (b) No. (c) N.A. (v) (a) Deesa and Surat. (b) N.A. (vi) Damage due to seasonal abnormality of about 10%. (vii) Nil.

5. RESULTS:
(i) 881 lb./ac. (ii) 161.7 lb./ac. (iii) The treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>2</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>909</td>
<td>832</td>
<td>998</td>
<td>865</td>
<td>803</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>72.30 lb./ac.</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Crop :- Jowar (Kharif).
Site :- M.A.E. Farm, Umrala.

Object :- Type II—To study the effect of organic and inorganic manures on the yield of Jowar.
1. BASAL CONDITIONS:
(i) (a) Cotton—Jowar—Wheat. (b) Cotton. (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 1st and 2nd week of July, 1957. (iv) 'a' Two ploughings with country plough followed by two harrowings. (b) Drilling with indigenous drill. (c) 6 lb./ac. (d) 18"×12". (e) —. (v) Nil. (vi) Local (85-95 days). (vii) Unirrigated. (viii) One weeding and interculture. (ix) 23°. (x) 1st and 2nd week of October, 1957.

2. TREATMENTS:
Main-plot treatments:
- 2 levels of F.Y.M.: F₀ = 0 and F₁ = 5000 lb./ac.

Sub-plot treatments:
- All combinations of (1), (2) and (3):
  (1) 3 levels of N as A₁/₂/₃: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
  (2) 3 levels of P₂₀₅ as Super: P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.
  (3) 3 levels of K₂₀ as Mur. of Pot.: K₀ = 0, K₁ = 20 and K₂ = 40 lb./ac.

3. DESIGN:
(i) Split-plot confd. (ii) (a) 2 main-plots/replication; 3 blocks/main-plot (and 9 sub-plots/block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/151.25 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Experiment during 1956-57 not laid out according to plan while during 1959-60, it is completely vitiated due to rainfall.

5. RESULTS:
(i) 837 lb./ac. (ii) (a) 87.0 lb./ac. (b) 125.2 lb./ac. (iii) N and P effects are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>709</td>
<td>872</td>
<td>826</td>
<td>653</td>
<td>820</td>
<td>933</td>
<td>806</td>
<td>758</td>
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<td>773</td>
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<td>945</td>
<td>867</td>
<td>870</td>
<td>878</td>
<td>871</td>
</tr>
<tr>
<td>Mean</td>
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<td>857</td>
<td>912</td>
<td>700</td>
<td>871</td>
<td>939</td>
<td>836</td>
<td>814</td>
<td>860</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. F marginal means = 23.7 lb./ac.
2. N, P or K marginal means = 41.7 lb./ac.
3. N, P or K means at the same level of F = 59.0 lb./ac.
4. F means at the same level of N, P or K = 53.7 lb./ac.
5. Means in the body of N×P, N×K or P×K tables = 72.3 lb./ac.

Crop :- Jowar (Kharif).

Object :- To find out the best combination of different varieties of manures for Jowar.
2. TREATMENTS:

Main-plot treatments:
2 levels of manuring: M₀ = No manure and M₁ = 200 lb./ac. of manure mixture.

Sub-plot treatments:
3 varieties: V₁ = Local, V₂ = E-56-A and V₃ = S-231.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) Two rows on each side. (vi) Yes.

4. GENERAL:
(i) The crop was of average type. V₃, being a late variety, suffered heavy loss due to lack of moisture. (ii) Light attack of long smut. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 112 lb./ac. (ii) (a) 15.87 lb./ac. (b) 34.59 lb./ac. (iii) M effect is significant, V effect is highly significant while interaction is not significant. (iv) (a) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M₀</td>
<td>138</td>
<td>154</td>
<td>7</td>
<td>100</td>
</tr>
<tr>
<td>M₁</td>
<td>145</td>
<td>182</td>
<td>44</td>
<td>124</td>
</tr>
<tr>
<td>Mean</td>
<td>142</td>
<td>168</td>
<td>26</td>
<td>112</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means = 5.66 lb./ac.
2. V marginal means = 17.30 lb./ac.
3. V means at the same level of M = 24.46 lb./ac.
4. M means at the same level of V = 20.75 lb./ac.

Crop: Jowar (Kharif).
Ref: Gj. 57(85).
Type: 'MV'.

Object: To study the effect of manures on the performance of different varieties of Jowar.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) 20 lb./ac. of N as A/S. (ii) (a) Medium black. (b) Refer soil analysis, Umrala.
(iii) 28.6.1957. (iv) (a) 2 ploughings and 2 harrowings. (b) to (e) N.A. (v) Nil. (vi) As per treatments.
(vii) Unirrigated. (viii) 1 thinning and 1 interculturing. (ix) 34°. (x) 16.10.1957.

2. TREATMENTS:
Main-plot treatments:
2 levels of N: N₀ = 0 and N₁ = 10 lb./ac.

Sub-plot treatments:
3 varieties: V₁ = S—231 (late), V₂ = E—56—A (early) and V₃ = Local (early).

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 51' x 12', (b) 45' x 9'. (v) 3' x 1½'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—1957. (b) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 249 lb./ac. (ii) (a) 21.51 lb./ac. (b) 33.91 lb./ac. (iii) N and V effects are highly significant. Interaction N x V is significant. (iv) Av. yield of grain in lb./ac.
Crop: Jowar (Kharif).

Object: To study the effect of Non different varieties of Jowar.

1. BASEL CONDITIONS:
   (i) (a) to (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 7.7.1956. (iv) (a) One harrowing. (b) Drilling. (c) 6 lb./ac. 'd; 18' between rows. (e)—. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 varieties: V1 = S-231, V2 = E-56—A and V3 = Local.

   Sub-plot treatments:
   2 levels of N as A/S: N0 = 0 and N1 = 10 lb./ac. applied at sowing.

3. DESIGN:
   (i) Split-plot. (ii) 'a) 3 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 51' x 12'. (b) 45' x 9'. 'v' 3' x 1.5'. (v) Yes.

4. GENERAL:
   (i) Not satisfactory. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) N.A (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 240 lb./ac. (ii) (a) 66.15 lb./ac. (b) 150.8 lb./ac. (iii) Only V effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>136</td>
<td>255</td>
<td>185</td>
<td>192</td>
</tr>
<tr>
<td>N1</td>
<td>145</td>
<td>390</td>
<td>329</td>
<td>288</td>
</tr>
<tr>
<td>Mean</td>
<td>140</td>
<td>322</td>
<td>257</td>
<td>240</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 33.08 lb./ac.
2. N marginal means = 61.56 lb./ac.
3. V means at the same level of N = 106.63 lb./ac.
4. V means at the same level of N = 111.64 lb./ac.
Crop :- Jowar (Rabi).

Object :- To find out suitable spacing and seed rate for Rabi Jowar.

1. BASAL CONDITIONS:
   (i) (a) Fallow—Wheat—Jowar (Rabi). (b) Wheat. (c) Nil. (ii) (a) Black soil. (b) N.A. (iii) 14.10.1954.
   (iv) (a) N.A. (b) Drilling. (c) As per treatments. (d) Between rows—according to treatments and irregular

2. TREATMENTS:
   Main-plot treatments :
   3 spacing between rows : S1=2', S2=3' and S3=2' and 3' alternately.
   Sub-plot treatments :
   3 seed rates : R1=6, R2=8 and R3=10 lb.ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 27'x38'.
   27'x42' and 27'x40' for S1, S2 and S3 respectively. (b) 17'x30'. (v) Two rows on either side and 5' at
   each end. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain and chaff yield. (iv) (a) 1952—1954. (b) and (c) No. (v) (a) and (b)
   No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 944 lb.ac. (ii) (a) 153.1 lb.ac. (b) 115.4 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>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>916</td>
<td>976</td>
<td>956</td>
<td>949</td>
</tr>
<tr>
<td>R2</td>
<td>895</td>
<td>915</td>
<td>918</td>
<td>909</td>
</tr>
<tr>
<td>R3</td>
<td>984</td>
<td>985</td>
<td>952</td>
<td>974</td>
</tr>
<tr>
<td>Mean</td>
<td>932</td>
<td>959</td>
<td>942</td>
<td>944</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. S marginal means  =51.03 lb.ac.
2. R marginal means  =38.47 lb.ac.
3. R means at the same level of S  =66.62 lb.ac.
4. S means at the same level of R  =74.58 lb.ac.

Crop :- Jowar (Kharif).
Site :- Agri. Res. Stn., Deesa.

Object :- To study the suitability of departmental and local methods of cultivation for Jowar.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Coarse sandy loam. (b) Refer soil analysis, Deesa. (iii) 22.8.1956.
   (iv) (a) N.A. (b) Drilling. (c) As per treatments. (d) Between rows—as per treatments and irregular
   and 3 weedicings on 14, 15.9.1955 and 5.10.1955. (ix) 15.65'. (x) 17.11.1955.

2. TREATMENTS:
   (1) Departmental method : Spacing between rows 15'+ seed rate at 4 lb.ac.
   (2) Local method : Spacing between rows 12'+ seed rate at 16 lb.ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 42.5'x20', 42'-5'x19' for treatments 1 and 2 respectively.
   (b) 36'-3'x15'. (v) 3'-1' on lengthwise and 4 rows breathwise. (vi) Yes.
4. GENERAL:
(i) Not good. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (b) and (c) No. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 184 lb./ac. (ii) 100.8 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>187</td>
<td>181</td>
</tr>
</tbody>
</table>

S.E./mean = 29.1 lb./ac.

---

**Crop:** Jowar (Kharif).  
**Site:** Agri. Res. Stn., Deesa.  
**Ref:** Gj. 56(19).  
**Type:** 'C'.

Object:—To study the suitability of departmental and local methods of cultivation for Jowar.

2. BASAL CONDITIONS:
(i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Coarse sandy loam. (b) Refer soil analysis, Deesa. (iii) 22.8.1956.  
(d) Between rows—as per treatments; between plants—irregular. (e) N.A. (f) Nil. (g) Malvan (local). (h) Unirrigated. (i) One weeding on 23.9.1956 and 1 interculturing on 27.9.1956. (x) 35.39'. (x) 25.11.1956.

3. TREATMENTS:
Same as in exp. no. 55(20) on page 153.

4. GENERAL:
(i) Normal. (ii) There was some attack of birds. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (b) No. (c) No. (d) and (e) Nil.

5. RESULTS:
(i) 468 lb./ac. (ii) 65.5 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>583</td>
<td>353</td>
</tr>
</tbody>
</table>

S.E./mean = 18.9 lb./ac.

---

**Crop:** Jowar (Kharif).  
**Site:** Agri. Res. Stn., Deesa.  
**Ref:** Gj. 57(18).  
**Type:** 'C'.

Object:—To study the suitability of departmental and local methods of cultivation.

2. BASAL CONDITIONS:
(i) Nil. (b) Jowar. (c) Nil. (ii) (a) Yellowish and brown. (b) Refer soil analysis, Deesa. (iii) 24.7.1957. (iv) (a) One ploughing on 17.7.1957. (b) Drilling. (c) As per treatments. (d) Between rows—as per treatments and irregular between plants. (e) N.A. (f) 3 C.L. of F Y M. spread by hand on 1.7.1957. (g) Malvan (local). (h) Unirrigated. (i) Interculturing—7.9.1957. (x) 14.57'. (x) 10.13.12.1957.

2. TREATMENTS:
Same as in exp. no. 55 (20) on page 153.
3. DESIGN:
(i) R.B.D.  (ii) (a) 2.  (b) N.A.  (iii) 12.  (iv) (a) 42°—5"×20° and 42.5°×19° for treatments 1 and 2 respectively.  (b) 36°—3"×15° (v) 3"—11" length wise and 4 rows breadthwise.  (vi) Yes.

4. GENERAL:
(i) The germination was defective and gap filling had to be followed.  (ii) Nil.  (iii) Grain and fodder yield.  (iv) (a) 1955—contd.  (b) and (c) No.  (v) (a) and (b) No.  (vi) and (vii) Nil.

5. RESULTS:
(i) 150 lb./ac.  (ii) 83.1 lb./ac.  (iii) Treatment difference is highly significant.  (iv) Av. yield of grain in lb./ac.

Treatment  |   1   |   2   
Av. yield   | 247   | 54
S.E./mean   =24.0 lb./ac.

Crop :- Jowar (Kharif).

Object :-To find out a suitable date of sowing for Jowar.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Groundnut.  (c) Nil.  (ii) (a) Medium black.  (b) Refer soil analysis, Halvad.  (iii) As per treatments.  (iv) (a) Two harrowings.  (b) Drilling.  (c) 12 lb./ac.  (d) 18" between rows.  (e) —
(v) 200 lb./ac. of manure mixture broadcast before sowing.  (vi) Local.  (vii) Irrigated (viii) Nil.
(ix) 33.75".  (x) for D1 27.9.1956 for D2 3.10.1956 for D3 13.10.1956.

2. TREATMENTS:
5 sowing dates: D1 =15.6.1956, D2 =22.6.1956, D3 =29.6.1956, D4 =6.7.1956 and D5 =13.7.1956. Treatment D3 was dropped due to continuous rain. Also sowing of D4 was postponed to 10.7.1956. Expt. analysed as R.B.D.

3. DESIGN:
(i) L. Sq.  (ii) (a) 5 (4 effective treatments) (b) N.A.  (iii) 5.  (iv) (a) 51'×18'. (b) 45°×12°. (v) 3°×3°.
(vi) Yes.

4. GENERAL:
(i) Poor.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1956—N.A.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.
(vi) and (vii) Nil.

5. RESULTS:
(i) 299 lb./ac.  (ii) 101.0 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of grain in lb./ac.

Treatment  |   D1   |   D2   |   D3   |   D4   
Av. yield   | 472   | 435   | 140   | 126
S.E./mean   =45.15 lb./ac.

Crop :- Jowar (Kharif).
Ref :- Gj. 58(17).
Type :- 'C'.

Object :-To find out a suitable date of sowing for Jowar.
1. **BASAL CONDITIONS:**
   (i) (a) Legume—Cereal—Cotton.  (b) Cotton.  (c) Nil.  (ii) (a) Medium black.  (b) Refer soil analysis, Halvad.  (iii) As per treatments.  (iv) (a) 1 ploughing and 2 harrowings.  (b) Drilling.  (c) 12 lb./ac.  (d) 18"x4".  (e) N.A.  (v) 10 C.L./ac. of compost + 200 lb./ac. of manure mixture before sowing.  (vi) E—56—A.  (vii) Irrigated.  (viii) 2 weedicings and 1 intercultering.  (ix) 13°.  (x) 30.9.1958 to 30.10.1958.

2. **TREATMENTS:**

3. **DESIGN:**
   (i) L. Sq.  (ii) 5.  (b) N.A.  (iii) 5.  (iv) (a) 40'x14'.  (b) 34'x7'.  (v) 3'x3'.  (vi) Yes.

4. **GENERAL:**
   (i) Good.  (ii) Attack of shoot borers.  (iii) Grain yield.  (iv) (a) 1956—contd.  (b) No.  (c) Nil.  (v) No.  (vi) Nil.  (vii) Expt. analysed as R.B.D. as layout plan was not available.

5. **RESULTS:**
   (i) 262.4 lb./ac.  (ii) 73.62 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of grain in lb./ac.
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>266</td>
<td>272</td>
<td>332</td>
<td>238</td>
<td>204</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 32.91 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Crop :- Jowar (Kharif).**  
**Site :- Agri. Res. Stn., Surat.**  
**Ref :- Gj. 55(46).**  
**Type :- 'C'.**

Object — To find out suitable sowing time for Jowar.

1. **BASAL CONDITIONS:**
   (i) (a) 'C' Cotton—Jowar.  (b) Cotton.  (c) Nil.  (ii) (a) Black cotton soil.  (b) Refer soil analysis, Surat.  (iii) As per treatments.  (iv) (a) and (b) N.A.  (c) 8 lb./ac.  (d) 3'x1'.  (e) N.A.  (v) Nil.  (vi) B.P—53.  (vii) Irrigated.  (viii) 1 thinning, 1 weeding and 2 interculturings.  (ix) 37.3°.  (x) 16.2.1955.

2. **TREATMENTS:**

3. **DESIGN:**
   (i) R.B.D.  (ii) (a) 3.  (b) N.A.  (iii) 4.  (iv) (a) 100'x21'.  (b) 88'x15'.  (v) 2 rows on either side and 3' at either end.  (vi) Yes.

4. **GENERAL:**
   (i) Normal.  (ii) Borer attack observed.  (iii) Grain yield.  (iv) (a) N.A.  (b) No.  (c) Nil.  (v) (a) and (b) Nil.  (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 858.7 lb./ac.  (ii) 54.3 lb./ac.  (iii) Treatments do not differ significantly.  (iv) Av. yield of grain in lb./ac.
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>865</td>
<td>885</td>
<td>826</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 27.15 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Crop :- Jowar (Kharif).**  
**Site :- Agri. Res. Stn., Surat.**  
**Ref :- Gj. 55(46).**  
**Type :- 'C'.**

Object — To find out suitable sowing time for Jowar.
1. BASAL CONDITIONS:
(i) (a) Jowar after cotton. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) As per treatments. (iv) (a) N.A. (b) Drilling. (c) 8 lb./ac. (d) 3'x1'. (e) N.A. (v) Nil. (vi) Jowar B.P.—53. (vii) Unirrigated. (viii) 2 thinnings, 3 intercultureings and 1 weeding. (ix) 27th. (x) 1.1.1956.

2. TREATMENTS:

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 21'x100'. (b) 15'x88'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Attack of borer. (iii) Grain and fodder yield. (iv) (a) 1953—55. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS:
(i) 361.7 lb./ac. (ii) 32.2 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>$D_3$</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>373</td>
<td>365</td>
<td>347</td>
<td>$16.1$ lb./ac.</td>
</tr>
</tbody>
</table>

_Crop:_ Jowar (Kharif).  
_Site:_ Agri. Res. Stn., Surat.  
Object:—To find out suitable sowing time for Jowar.

1. BASAL CONDITIONS:
(i) (a) Cotton—Jowar. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) As per treatments. (iv) (a) N.A. (b) N.A. (c) 8 lb./ac. (d) 3'x1'. (e) N.A. (v) Nil. (vi) B.P.—53. (vii) Irrigated. (viii) 3 thinnings and 3 intercultureings. (ix) 41.74'. (x) 5.2.1957.

2. TREATMENTS:

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) 100'x21'. (b) 88'x15'. (v) 2 rows on either side and 3' at either end. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Borer attack. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 635 lb./ac. (ii) 59.76 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$D_1$</th>
<th>$D_2$</th>
<th>$D_3$</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>659</td>
<td>624</td>
<td>621</td>
<td>$29.88$ lb./ac.</td>
</tr>
</tbody>
</table>

_Crop:_ Jowar (Kharif).  
_Site:_ Agri. Res. Stn., Surat.  
Object:—To find the effect of different spacings and number of plants per hill on yield of Jowar.
1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat.
   (iii) 17.8.1957. (iv) (a) N.A. (b) Dibbling. (c) 8 lb./ac. (d) and (e) As per treatments. (v) 3 C.L./ac. of F.Y.M. on 6.6.1957. (vi) B.P.-53. (vii) Unirrigated. (viii) 1 thinning and 3 interculturings and once gap filling on 5.9.1956. (ix) 41.74°. (x) 31.1.1957.

2. TREATMENTS:
   All combinations of (1; and (2;)
   (1) 3 spacings: \( S_1 = 24" \times 24", S_2 = 30" \times 24", \) and \( S_3 = 36" \times 12". \)
   (2) No. of plants, hill: \( H_1 = \text{one}, H_2 = \text{a cluster of plants}. \)

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) For \( S_1 = 72" \times 38", \) for \( S_2 = 72" \times 40", \) and \( S_3 = 72" \times 42". \)
   (b) \( 66" \times 30". \) (v) \( 6" \times 4", 6" \times 5", \) and \( 6" \times 6" \) for \( S_1, S_2, \) and \( S_3 \) respectively. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1031 lb./ac. (ii) 157.0 lb./ac. in lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( H_1 )</td>
<td>1104</td>
<td>1276</td>
<td>1158</td>
</tr>
<tr>
<td>( H_2 )</td>
<td>998</td>
<td>780</td>
<td>871</td>
</tr>
<tr>
<td>Mean</td>
<td>1051</td>
<td>1028</td>
<td>1015</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of \( S \) = 78.5 lb./ac.
S.E. of marginal mean of \( H \) = 64.1 lb./ac.
S.E. of body of table = 111.0 lb./ac.

---

**Crop:** Jowar (*Kharif*).

**Site:** Agri. Res. Stn., Surat.

**Ref:** Gj. 57(67).

**Type:** 'C'.

Object:—To find the effect of different spacings and number of plants per hill on yield of Jowar.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat.
   (iii) 17.8.1957. (iv) (a) 1 ploughing. (b) Dibbling. (c) 8 lb./ac. (d) and (e) As per treatments. (v) 3 C.L./ac. of F.Y.M. in June 1957. (vi) B.P.-53. (vii) Unirrigated. (viii) 1 thinning and 1 weeding. (ix) 33.41°. (x) 11.2.1958.

2. TREATMENTS:
   Same as in exp. no. 56(58) on page 157.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) \( 72" \times 240". \) (iii) 2. (iv) (a) For \( S_1 = 72" \times 38", \) for \( S_2 = 72" \times 40", \) and \( S_3 = 72" \times 42". \)
   (b) \( 60" \times 30". \) (v) \( 6" \times 4", 6" \times 5", \) and \( 6" \times 6" \) for \( S_1, S_2, \) and \( S_3 \) respectively. (vi) Yes.

4. GENERAL:
   (i) Below normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 552 lb./ac. (ii) 142.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.
Object: To find the effect of different spacings and number of plants per hill on yield of Jowar.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. 
   (iii) 7.8.1958. (iv) (a) Nil. (b) Dibbling. (c) 6 to 8 lb./ac. (d) and (e) As per treatments. (v) 5 C.L./ac. 
   of F.Y.M. on 7.8.1958. (vi) B.P.—53. (vii) Unirrigated. (viii) 2 thinnings, 3 intercultures and 
   2 weedings. (ix) 44.81". (x) 27.2.1959.

2. TREATMENTS:
   Same as in exp. no. 56(58) on page 157.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) 72’×240’. (iii) 2. (iv) (a) For S1—72’×38’, for S2—72’×40’ and for 
   S3—72’×42’. (b) 60’×30’. (v) 6’×4’, 6’×5’ and 6’×6’ for S1, S2 and S3 respectively. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and 
   (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 730 lb./ac. (ii) 138.5 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of Jgrain in lb./ac.

Crop: Jowar (Kharif).

<table>
<thead>
<tr>
<th></th>
<th>H_1</th>
<th>H_2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>811</td>
<td>466</td>
<td>639</td>
</tr>
<tr>
<td>S2</td>
<td>557</td>
<td>599</td>
<td>578</td>
</tr>
<tr>
<td>S3</td>
<td>478</td>
<td>399</td>
<td>439</td>
</tr>
</tbody>
</table>

Mean: 615 488 552

S.E. of marginal mean of S = 71.2 lb./ac.
S.E. of marginal mean of H = 58.1 lb./ac.
S.E. of body of table = 100.6 lb./ac.

Crop: Jowar (Kharif).

<table>
<thead>
<tr>
<th></th>
<th>H_1</th>
<th>H_2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>729</td>
<td>685</td>
<td>707</td>
</tr>
<tr>
<td>S2</td>
<td>735</td>
<td>794</td>
<td>765</td>
</tr>
<tr>
<td>S3</td>
<td>962</td>
<td>474</td>
<td>718</td>
</tr>
</tbody>
</table>

Mean: 809 651 730

S.E. of marginal mean of S = 69.24 lb./ac.
S.E. of marginal mean of H = 56.54 lb./ac.
S.E. of body of table = 97.93 lb./ac.

Crop: Jowar (Kharif).

<table>
<thead>
<tr>
<th></th>
<th>H_1</th>
<th>H_2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>729</td>
<td>685</td>
<td>707</td>
</tr>
<tr>
<td>S2</td>
<td>735</td>
<td>794</td>
<td>765</td>
</tr>
<tr>
<td>S3</td>
<td>962</td>
<td>474</td>
<td>718</td>
</tr>
</tbody>
</table>

Mean: 809 651 730

S.E. of marginal mean of S = 69.24 lb./ac.
S.E. of marginal mean of H = 56.54 lb./ac.
S.E. of body of table = 97.93 lb./ac.

Crop: Jowar (Kharif).

<table>
<thead>
<tr>
<th></th>
<th>H_1</th>
<th>H_2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>729</td>
<td>685</td>
<td>707</td>
</tr>
<tr>
<td>S2</td>
<td>735</td>
<td>794</td>
<td>765</td>
</tr>
<tr>
<td>S3</td>
<td>962</td>
<td>474</td>
<td>718</td>
</tr>
</tbody>
</table>

Mean: 809 651 730

S.E. of marginal mean of S = 69.24 lb./ac.
S.E. of marginal mean of H = 56.54 lb./ac.
S.E. of body of table = 97.93 lb./ac.
1. BASAL CONDITIONS:

1. (a) Cotton—Jowar. (b) Cotton. (c) Nil. (ii) (a) Black soil. (b) Refer soil analysis, Surat. (iii) 12.8.1959. (iv) (a) Nil. (b) Drilling. (c) 6 to 8 lb. /ac. (d) and (e) As per treatments. vi) 5 C.L./ac. of F.Y.M. (v) B.P.-53. (vi) Unirrigated. (vii) 2 thinnings, 2 weedings and 3 intercultures. (x) 70.77°. (x) Mid-Feb. 1960.

2. TREATMENTS:

Same as in expt. no. 56(58) on page 157.

3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) 72’x240’. (iii) 2. (iv) For S1—72’x38’, S2—72’x43’ and for S3—72’x42’. (b) 6’x30’. (v) 6’x4’, 6’x5’ and 6’x6’ for S1, S2 and S3 respectively. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 863 lb./ac. (ii) 89.73 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>H1</th>
<th>H2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>912</td>
<td>820</td>
<td>866</td>
<td></td>
</tr>
<tr>
<td>959</td>
<td>821</td>
<td>890</td>
<td></td>
</tr>
<tr>
<td>936</td>
<td>729</td>
<td>832</td>
<td></td>
</tr>
</tbody>
</table>

| Mean | 936 | 790 | 863 |

S.E. of marginal mean of H = 44.86 lb./ac.
S.E. of marginal mean of S = 36.64 lb./ac.
S.E. of body of table = 63.46 lb./ac.

Crop :- Jowar (Kharif).
Object :-To find the optimum time of sowing for Jowar.

1. BASAL CONDITIONS:

(i) (a) to (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) As per treatments. (iv) (a) Nil. (b) Drilling. (c) 6 lb./ac. (d) 18’ between rows, (e) -. (v) 10 lb./ac. of N as manure mixture on 10.9.1956. (vi) N.A. (vii) Irrigated. (viii)2 weedings. (ix) and (x) N.A.

2. TREATMENTS:

7 dates of sowing : D1 = 15th Jun, D2 = 22nd Jun, D3 = 29th Jun, D4 = 6th July, D5 = 13th July, D6 = 20th July and D7 = 27th July, 1956.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 24’x36’. (b) 18’x30’. (v) 3’x3’. (vi) Yes.

4. GENERAL:

(i) Not satisfactory. (ii) Heavy attack of top-shoot borer and aphids. Nicotine sulphate was sprayed. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) Yields are very low. Reasons N.A.

5. RESULTS:

(i) 54.85 lb./ac. (ii) 35.70 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
Crop :- Jowar (Kharif).


Object :- To find out the optimum time of sowing for Jowar.

1. BASAL CONDITIONS :
   (i) (a) N.Z. (b) Wheat. (c) 20 lb./ac. of N as A/S. (ii) (a) Medium black. (b) Refer soil analysis,
   Umrala. (iii) As per treatments. (iv) (a) One tractor ploughing and two harrowings. (b) to (e) N.A.
   (v) 20 lb./ac. of N as manure mixture. (vi) Jowar (local, early.) (vii) Unirrigated. (viii) Thinning on

2. TREATMENTS :
   7 dates of sowing : D1=15th June, D2=22nd June, D3=29th June, D4=6th July, D5=13th July, D6=
   20th July and D7=27th July, 1957.

3. DESIGN :
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) 36'×24'. (b) 30'×18'. (v) 3'×3'. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Ht. of plants, length of ear, wt. of ear and wt. of grain/ear. Grain and fodder
   yield. (iv) (a) 1956 to 57. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 307 lb./ac. (ii) 57.18 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain
   in lb./ac.

   Treatment          D1   D2   D3   D4   D5   D6   D7
   Av. yield          312  429  531  431  267  124   57
   S.E./mean         =25.56 lb./ac.

Crop :- Jowar (Kharif).


Object :- To find out a suitable combination of spacing, seed rate and fertilizer for Jowar.

1. BASAL CONDITIONS :
   (i) (a) Cotton—Jowar—Wheat or Groundnut. (b) N.A. (c) N.A. (ii) (a) Sandy. (b) Refer soil analysis,
   Bhachau. (iii) 15.7.1958. (iv) (a) One ploughing and one harrowing. (b) Drilling. (c) and (d) As per
   treatments. (e) N.A. (v) N.A. (vi) E—56 A (early). (vii) Unirrigated. (viii) 2 interculturings. (ix)
   25.62". (x) N.A.

2. TREATMENTS :
   All combinations of (1), (2) and (3).
   (1) 3 spacings between rows : S1=18", S2=36" and S3=54".
   (2) 3 seed rates : R1=5, R2=10 and R3=15 lb./ac.
   (3) 3 doses of fertilizers : M0=0, M1=20 lb./ac. of N+10 lb./ac. of P2O5 and M2=40 lb./ac. of
   N+20 lb./ac. of P2O5.

3. DESIGN :
   (i) 30 confd. (ii) (a) 3 blocks/repllication ; 9 plots/block. (b) N.A. (iii) One. (iv) (a) 50'×18'. (b)
   45'×12'. (v) 2.5'×3'. (vi) Yes.
4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1958—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) As the plan of the expt. was N.A., the expt. was analysed as simple factorial.

5. RESULTS:
(i) 288 lb./ac. (ii) 90.02 lb./ac. (iii) Only S effect is highly significant. Other effects and interactions are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>344</td>
<td>218</td>
<td>156</td>
<td>239</td>
<td>222</td>
<td>309</td>
<td>187</td>
</tr>
<tr>
<td>483</td>
<td>262</td>
<td>220</td>
<td>322</td>
<td>274</td>
<td>333</td>
<td>358</td>
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<td>399</td>
<td>273</td>
<td>235</td>
<td>302</td>
<td>220</td>
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<tr>
<td>Mean</td>
<td>409</td>
<td>251</td>
<td>204</td>
<td>288</td>
<td>239</td>
<td>346</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 30.01 lb./ac.
S.E. of body of any table = 51.97 lb./ac.

Crop: Jowar (Rabi).
Ref: Gj. 59(118).
Type: 'CM'.

Object:—To study the effect of improved method of cultivation on the yield of Jowar.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Black. (b) Refer soil analysis, Dabhoi. (iii) 28.10.1958. (iv) (a) 2 ploughings and 2 harrowings. (b) Drilling. (c) 10 lb./ac. (d) 18" between rows. (e) —. (v) Nil. (vi) Jowar B.D.—8. (vii) Irrigated. (viii) One interculturing on 8.12.1959. (ix) N.A. (x) 25.3.1959.

2. TREATMENTS:
(1) Improved Method: 5 C.L./ac. of F.Y.M.+40 lb./ac. of N as A/S+20 lb./ac. of P2O5 as Super.
(2) Local Method: 5 C.L./ac. of F.Y.M.+Seed rate at 10 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) 40°×30°. (b) 35°×30°. (v) 2.5°×3°. (vi) Yes.

4. GENERAL:
(i) Not satisfactory. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1959—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) —.

5. RESULTS:
(i) 135.5 lb./ac. (ii) 56.09 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>157</td>
<td>114</td>
</tr>
</tbody>
</table>
S.E./mean  = 22.90 lb./ac.
Crop: Jowar (Kharif).

Object: To find out whether departmental method of cultivation is superior to local method.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Castor. (c) Nil. (ii) (a) Yellowish brown. (b) Refer soil analysis, Deesa. (iii) 25.8.1958. (iv) (a) 3 ploughings and 2 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A.

2. TREATMENTS:
   Method of cultivation
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Seed rate</th>
<th>Spacing</th>
<th>N as A/S</th>
<th>P2O5</th>
<th>F.Y.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Departmental</td>
<td>4 lb./ac.</td>
<td>24&quot;</td>
<td>20 lb./ac.</td>
<td>20 lb./ac.</td>
<td>3 C.L./ac.</td>
</tr>
<tr>
<td>2. Local</td>
<td>16 lb./ac.</td>
<td>12&quot;</td>
<td>Nil.</td>
<td>Nil</td>
<td>3 C.L./ac.</td>
</tr>
</tbody>
</table>

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) 120' x 42'. (iii) 12. (iv) (a) 20' x 42'. (b) 15' x 36'. (v) 2.5' x 3'. (vi) Yes.

4. GENERAL:
   (i) Not satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 468.7 lb./ac. (ii) 114.0 lb./ac. (iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.

   Treatment  | Av. yield  |
   1          | 572        |
   2          | 365        |

   S.E./mean = 32.90 lb./ac.

---

Crop: Jowar.

Object: To find out a suitable combination of spacing, seed rate and fertilizer for Jowar.

1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton. (b) Cotton. (c) Nil. (ii) (a) Medium black with poor fertility. (b) Refer soil analysis, Halvad. (iii) 9.7.1958. (iv) (a) 1 ploughing, 1 harrowing. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) E—56-A. (vii) Irrigated. (viii) 2 interculturings and 2 weedings. (ix) 13'. (x) 20.10.1958.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 spacings between rows: S1=18", S2=36" and S3=54".
   (2) 3 seed rates: R1=5, R2=10 and R3=15 lb./ac.
   (3) 3 doses of fertilizers: M9=0, M1=20 lb./ac. of N+10 lb./ac. of P2O5 and M2=40 lb./ac. of N+20 lb./ac. of P2O5.
   P2O5 broadcast before sowing. N applied in two doses: first before sowing and second a month after sowing.

3. DESIGN:
   (i) 3² Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) 40' x 18'. (b) 34' x 9'. (v) 3' x 4.5'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Slight attack of insects and top-shoot borer. (iii) Grain yield. (iv) (a) 1958—contd. (failed in 1959). (b) N.A. (c) No. (v) (a) Junagadh, Umrala and Jamnagar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 589 lb./ac. (ii) 92.8 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
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<tbody>
<tr>
<td>R₁</td>
<td>665</td>
<td>658</td>
<td>507</td>
<td>610</td>
<td>362</td>
<td>643</td>
<td>824</td>
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<tr>
<td>R₂</td>
<td>617</td>
<td>701</td>
<td>472</td>
<td>596</td>
<td>325</td>
<td>633</td>
<td>831</td>
</tr>
<tr>
<td>R₃</td>
<td>609</td>
<td>572</td>
<td>503</td>
<td>562</td>
<td>283</td>
<td>565</td>
<td>837</td>
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<tr>
<td>Mean</td>
<td>630</td>
<td>644</td>
<td>494</td>
<td>589</td>
<td>323</td>
<td>614</td>
<td>831</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 21.88 lb./ac.
S.E. of body of any table = 37.89 lb./ac.

**Crop:** Jowar (Kharif).

**Site:** Agri. Res. Stn., Jamnagar.

**Object:** To find out a suitable combination of spacing, seed rate and fertilizer for Jowar.

1. **Basal Conditions:**
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 25.6.1958. (iv) (a) N.A. (b) Drilled.
   (c) and (d) As per treatments. (e) N.A. (v) E-56-A. (vi) Unirrigated. (vii) N.A. (ix) 28.4", (a) N.A.

2. **Treatments:**
   All combinations of (1), (2), and (3)
   (1) 3 spacing between rows : S₁ = 18", S₂ = 36" and S₃ = 54".
   (2) 3 seed rates : R₁ = 5, R₂ = 10 and R₃ = 15 lb./ac.
   (3) 3 doses of fertilizers: M₀ = 0, M₁ = 20 lb./ac. of N + 10 lb./ac. of P₂O₅ and M₂ = 40 lb./ac. of N + 20 lb./ac. of P₂O₅.
   N as A/S broadcast and P₂O₅ as Super drilled.

3. **Design:**
   (i) 3² Fact. in R.B.D. (ii) 'a' 27. (b) N.A. (iii) 2. (iv) (a) 40' x 18'. (b) 34' x 9'. (v) 3' x 4.5'. (vi) Yes.

4. **General:**
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1958—N.A. (b) N.A. (c) No. (v) 'a' and (b) N.A. (vi) and (vii) Nil.

5. **Results:**
   (i) 288 lb./ac. (ii) 73.17 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>R₁</td>
<td>257</td>
<td>267</td>
<td>275</td>
<td>260</td>
<td>265</td>
<td>269</td>
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<td>R₂</td>
<td>337</td>
<td>274</td>
<td>265</td>
<td>292</td>
<td>249</td>
<td>323</td>
<td>303</td>
</tr>
<tr>
<td>R₃</td>
<td>280</td>
<td>325</td>
<td>268</td>
<td>291</td>
<td>222</td>
<td>312</td>
<td>340</td>
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<tr>
<td>Mean</td>
<td>305</td>
<td>289</td>
<td>269</td>
<td>288</td>
<td>245</td>
<td>301</td>
<td>316</td>
</tr>
</tbody>
</table>

M₀     | 225    | 263    | 248    |
M₁     | 328    | 298    | 278    |
M₂     | 360    | 305    | 282    |
Crop :- Jowar.  
Site :- Central Expt. Stn., Junagadh.  
Object :-To find out a suitable combination of spacing, seed rate and fertilizer for Jowar.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A.  
   (ii) (a) Medium black.  
   Refer soil analysis, Junagadh.  
   (iii) 4.7.1958.  
   (iv) (a) N.A.  
   (b) Drilling.  
   (c) and (d) As per treatments.  
   (e) N.A.  
   (v) Nil.  
   (vi) S-213.  
   (vii) Unirrigated.  
   (viii) N.A.  
   (ix) 38.72°.  
   (v) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 spacing between rows : S1=18", S2=36" and S3=54".
   (2) 3 seed rates : R1=5, R2=10 and R3=15 lb./ac.
   (3) 3 doses of fertilizers : M0=0, M1=20 lb./ac. of N+10 lb/ac. of P2O5 and M2=40 lb./ac. of N+20 lb./ac. of P2O5.

3. DESIGN:
   (i) 3² confd.  
   (ii) (a) 9 plots/block ; 3 blocks/replication.  
   (b) N.A.  
   (iii) 2.  
   (iv) (a) 40’x18’.  
   (b) 34’x9’.  
   (v) 3’x 4.5’.  
   (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A.  
   (iii) Grain and fodder yield.  
   (iv) (a) 1958—contd.  
   (b) N.A.  
   (c) No.  
   (v) (a) and (b) Nil.  
   (vi) and (vii) N.A.

5. RESULTS:
   (i) 867 lb./ac.  
   (ii) 141.2 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
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<tbody>
<tr>
<td>R1</td>
<td>1019</td>
<td>904</td>
<td>821</td>
<td>914</td>
<td>887</td>
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<tr>
<td>R2</td>
<td>805</td>
<td>860</td>
<td>968</td>
<td>877</td>
<td>913</td>
<td>870</td>
<td>849</td>
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<tr>
<td>R3</td>
<td>844</td>
<td>816</td>
<td>769</td>
<td>810</td>
<td>765</td>
<td>805</td>
<td>859</td>
</tr>
<tr>
<td>Mean</td>
<td>889</td>
<td>860</td>
<td>853</td>
<td>867</td>
<td>855</td>
<td>868</td>
<td>878</td>
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</tbody>
</table>

M0 935 854 776
M1 857 839 907
M2 875 887 874

S.E. of any marginal mean =33.29 lb./ac.
S.E. of body of any table =57.66 lb./ac.
1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 30.6.1959. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) S-213. (vii) Unirrigated. (viii) N.A. (ix) and (x) N.A.

2. TREATMENTS:
Same as in expt. no. 58(81) on page 165.

3. DESIGN:
(i) 3^e confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 40'×18'. (b) 34'×9'. (v) 3'×4.5'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1958—condt. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 663 lb./ac. (ii) 160.1 lb./ac. (iii) S and R effects are significant. Others are 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>
<th>M₀</th>
<th>M₁</th>
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<td>446</td>
<td>601</td>
<td>574</td>
<td>527</td>
<td>603</td>
<td>592</td>
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<tr>
<td>R₂</td>
<td>827</td>
<td>629</td>
<td>657</td>
<td>704</td>
<td>690</td>
<td>713</td>
<td>710</td>
</tr>
<tr>
<td>R₃</td>
<td>730</td>
<td>808</td>
<td>592</td>
<td>710</td>
<td>682</td>
<td>773</td>
<td>675</td>
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<tr>
<td>Mean</td>
<td>744</td>
<td>628</td>
<td>617</td>
<td>663</td>
<td>633</td>
<td>696</td>
<td>659</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 37.75 lb./ac.
S.E. of body of any table = 65.36 lb./ac.

---

Crop: Jowar (Rabi).  
Object: To find out a suitable spacing together with application of manurial dose for Jowar.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 24.10.1959. (iv) (a) One harrowing. (b) Dibbling. (c) 8 lb./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) Jowar M-35-1. (vii) Irrigated. (viii) 2 to 3 interculturings. (ix) N.A. (x) 31.3.1960.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1): 3 spacings between rows: S₁=2', S₂=3' and S₃=4'.
(2): 3 levels of N: N₀=0, N₁=20 and N₂=40 lb./ac. of N.
(3): 3 levels of P₂O₅: P₀=0, P₁=20 and P₂=40 lb./ac. of P₂O₅.

3. DESIGN:
(i) 3^e confd. (NP²S² and NP₀S² confd.) (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (i) 2. (iv) (a) 36'×24'. (b) 30'×12'. (v) 3'×6'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of stem borer. (iii) Grain and fodder yield. (iv) (a) 1959—condt. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 845 lb./ac.  (ii) 130.6 lb./ac.  (iii) Only N effect is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
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<tr>
<td>P₀</td>
<td>769</td>
<td>810</td>
<td>861</td>
<td>813</td>
<td>808</td>
<td>859</td>
<td>773</td>
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<tr>
<td>P₁</td>
<td>778</td>
<td>899</td>
<td>860</td>
<td>846</td>
<td>896</td>
<td>811</td>
<td>830</td>
</tr>
<tr>
<td>P₂</td>
<td>717</td>
<td>924</td>
<td>983</td>
<td>875</td>
<td>943</td>
<td>878</td>
<td>803</td>
</tr>
<tr>
<td>Mean</td>
<td>755</td>
<td>878</td>
<td>901</td>
<td>845</td>
<td>883</td>
<td>849</td>
<td>802</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 30.78 lb./ac.
S.E. of body of any table = 53.32 lb./ac.

---

**Crop:** Jowar (Kharif).

**Site:** Agri. Res. Stn., Surat.

Object:—To find out a suitable method of cultivation for Jowar.

1. BASAL CONDITIONS:
(i) (a) Cotton—Jowar.  (b) Cotton.  (c) Nil.  (ii) (a) Deep black.  (b) Refer soil analysis, Surat.  (iii) 31.7.1955.  (iv) (a) N.A.  (b) Drilling.  (c) 8 lb./ac. for local and 4 lb./ac. for departmental methods.  (d) 3' x 1'.  (e) N.A.  (v) P₂O₅ applied on 25.7.1955.  (vi) Jowar P.B.-53.  (vii) Unirrigated.  (viii) 3 Inter-culturings, 1 weeding and 1 thinning.  (ix) 27'.  (x) 27.1.1956.

2. TREATMENTS:
1. Local method.
2. Departmental method
40 lb./ac. of N as A/S in two equal doses, one at the time of sowing and the other 3 weeks thereafter applied under departmental method.

3. DESIGN:
(i) R.B.D.  (ii) 2.  (b) N.A.  (iii) 12.  (iv) (a) 30' x 42'.  (b) 18 x 30'.  (v) 6' x 6'.  (vi) Yes.

4. GENERAL:
(i) Irregular rainfall caused gaps in growth.  (ii) Nil.  (iii) Grain and fodder yield.  (iv) (a) 1955—contd.  (b) and (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 949 lb./ac.  (ii) 83.93 lb./ac.  (iii) Treatment difference is highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>782</td>
<td>1116</td>
</tr>
</tbody>
</table>

S.E./mean = 24.2 lb./ac.

---

**Crop:** Jowar.

**Site:** Agri. Res. Stn., Surat.

Object:—To find out the suitable method of cultivation for Jowar.
1. BASAL CONDITIONS:
   (i) (a) Jowar—Cotton. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 16.8.1956. (iv) (a) N.A. (b) Drilling. (c) 8 lb./ac. for local, 4 lb./ac. for departmental. (d) 3'×1'. (e) N.A. (v) As per treatments. (vi) *Budh perio*. (vii) Unirrigated. (viii) 1 thinning and 3 interculturings. (ix) 41.8'. (x) 12.1.1957.

2. TREATMENTS:
   1. Local: No manure.
   2. Departmental: 20 lb./ac. of N at sowing and 20 lb./ac. of N three weeks later. 20 lb./ac. of P₂O₅ as Super before sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 42'×24'. (b) 36'×18'. (v) 3'×3'. (vi) Yes.

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

5. RESULTS:
   (i) 2448 lb./ac. (ii) 302.8 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment
   |   | 1 | 2 |
   | Av. yield | 2227 | 2669 |
   S.E./mean =87.4 lb./ac.

---

**Crop:** Jowar *(Kharif)*
**Site:** Agri. Res. Stn., Surat
**Object:** To find out suitable method of cultivation for Jowar.

---

Ref: Gj. 57(65).
Type: 'CM'.

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1. BASAL CONDITIONS:
   (i) (a) Jowar—Cotton. (b) Cotton. (c) Nil. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Surat. (iii) 30.7.1957. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) 3'×1'. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Jowar B.P.—53. (vii) Irrigated. (viii) 3 interculturings, 1 weeding and 1 thinning. (ix) 33.41'. (x) 2.2.1958.

2. TREATMENTS:
   Same as in expt. no. 56(57) on page 167.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 30'×42'. (b) 18'×30'. (v) 6'×6'. (vi) Yes.

4. GENERAL:
   (i) Growth was checked till end of Oct. for want of moisture. After irrigation the growth reached normalcy. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 950 lb./ac. (ii) 76.21 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac.
   Treatment
   |   | 1 | 2 |
   | Av. yield | 945 | 954 |
   S.E./mean =22.0 lb./ac.
Crop: Jowar (Kharif).

Object: To find out a suitable method of cultivation for Jowar.

1. BASAL CONDITIONS:
   (i) (a) Jowar—Cotton. (b) Cotton. (c) 20 lb./ac. of N as A/S. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Surat. (iii) 4.8.1958. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) 3'×1'. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Jowar B.P.-53. (vii) Unirrigated. (viii) Twice gap filling, 1 thinning and 4 interculturings. (ix) 44.81". (x) 27.2.1959.

2. TREATMENTS:
   Same as in expt. no. 56(57) on page 167.

3. DESIGN:
   (i) R.B.D. (ii) 2. (b) N.A. (iii) 12. (iv) (a) Basal dose of 5 C.L./ac. of F.Y.M; seed rate at 6 lbs./ac.; spacing 12" between rows. (v) 3'×2'. (vi) Yes.

4. GENERAL:
   (i) Growth normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 417 lb./ac. (ii) 29.07 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

       Treatment 1  2
       Av. yield    374  460

       S.E./mean = 8.39 lb./ac.

Crop: Jowar (Kharif).

Object: To find out a suitable method of cultivation for Jowar.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Moth. (c) Nil. (ii) (a) Sandy soil. (b) Refer soil analysis, Talod. (iii) 17.7.1956. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) As per treatments. (vi) Jowar (local). (vii) Unirrigated. (viii) 3 interculturings and 2 weedings. (ix) 32.06". (x) 18.12.1956.

2. TREATMENTS:
   1. Local method: Basal dose of 5 C.L./ac. of F.Y.M; seed rate at 6 lbs./ac.; spacing 12" between rows.
   2. Departmental method: Basal dose of 5 C.L./ac. of F.Y.M.+40 lb./ac. of N as A/S in two doses+20 lb./ac. of P2O5 as Super; seed rate at 4 lb./ac.; spacing 24" between rows.

3. DESIGN:
   (i) R.B.D. (ii) 2. (b) N.A. (iii) 12. (iv) (a) Basal dose of 5 C.L./ac. of F.Y.M.+40 lb./ac. of N as A/S in two doses+20 lb./ac. of P2O5 as Super; seed rate at 4 lb./ac.; spacing 24" between rows. (v) 3'×2'. (vi) Yes.

4. GENERAL:
   (i) The germination was defective as a result of continuous rain. The stand was also gappy. (ii) Slight attack of stem borer. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (failed in 1955). (b) and (c) Nil. (v) (a) Deesa and Surat. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 995 lb./ac. (ii) 183.2 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

       Treatment 1  2
       Av. yield    866  1124

       S.E./mean = 52.9 lb./ac.
Crop: Jowar (Kharif).

Object: To find out the suitable method of cultivation for Jowar.

1. BASAL CONDITIONS:
   (i) Nil.  (b) Groundnut.  (c) Nil.  (ii) (a) Sandy soil.  (b) Refer soil analysis, Talod.  (iii) 5.7.1958.
   (iv) (a) 1 ploughing, 2 harrowings.  (b) N.A.  (c) and (d) As per treatments.  (e) As per treatments.  (vi) Malvan (local).
   (vii) Unirrigated.  (viii) 3 interculturings and 2 weedings.  (ix) 3.2.1958.

2. TREATMENTS:
   Same as in exp. no. 56(64); on page 169.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 2.  (b) N.A.  (iii) 12.  (iv) (a) 40'x20'.  (b) 34'x16'.  (v) 3'x2'.  (vi) Yes.

4. GENERAL:
   (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 215 lb./ac.  (ii) 80.31 lb./ac.  (iii) Treatment difference is highly significant.  (iv) Av. yield of grain in lb./ac.

   Treatment  1  2
   Av. yield  128  187
   S.E./mean = 5.43 lb./ac.

---

Crop: Jowar (Kharif).

Object: To find out the suitable method of cultivation for Jowar.

1. BASAL CONDITIONS:
   (i) Nil.  (b) Groundnut.  (c) 5 C.I./ac. of F.Y.M.  (ii) (a) Sandy soil.  (b) Refer soil analysis, Talod.
   (iii) 4.7.1959.  (iv) (a) 1 ploughing; 2 harrowings.  (b) N.A.  (c) and (d) As per treatments.  (e) As per treatments.
   (vi) Malvan (Local)—late.  (vii) Unirrigated.  (viii) 3 interculturings and 2 weedings.  (x) 13.11.1959.

2. TREATMENTS:
   Same as in exp. no. 56(64); on page 169.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 2.  (b) N.A.  (iii) 12.  (iv) (a) 40'x20'.  (b) 34'x16'.  (v) 3'x2'.  (vi) Yes.

4. GENERAL:
   (i) Normal.  (ii) Attack of stem borer.  (iii) Grain and fodder yield.  (iv) (a) 1955—contd. (b) No.
   (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) N.A.

5. RESULTS:
   (i) 215 lb./ac.  (ii) 80.31 lb./ac.  (iii) Treatment difference is highly significant.  (iv) Av. yield of grain in lb./ac.

   Treatment  1  2
   Av. yield  68  363
   S.E./mean = 23.18 lb./ac.
Crop :- Jowar (Kharif).
Object :- To study the effect of different spacings, seed rates and manuring on the yield of Jowar.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 17.7.1958.
(iv) (a) One ploughing, one harrowing. (b) Hand sowing. (c) and (d) As per treatments.
(e) N.A. (v) Nil. (vi) E. 56-A. (vii) Unirrigated. (viii) One interculturing and one weeding. (ix) N.A.
(x) 16.10.1958.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 spacings between rows: \( S_1 = 18", S_2 = 36" 	ext{ and } S_3 = 54". \)
(2) 3 seed rates: \( R_1 = 5", R_2 = 10 \) and \( R_3 = 15 \text{ lb./ac.} \)
(3) 3 doses of fertilizers: \( M_0 = 0, M_1 = 20 \text{ lb./ac.} \text{ of } N+10 \text{ lb./ac. of } P_2O_5 \text{ and } M_2 = 40 \text{ lb./ac. of } N+20 \text{ lb./ac. of } P_2O_5 \).

3. DESIGN:
(i) 3\(^{3}\) confd. (ii) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 44'\times 18'. (b) 34'\times 9'.
(v) 5'\times 4.5'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A.
(vi) and (vii) Nil.

5. RESULTS:
(i) 441 lb./ac. (ii) 110.9 lb./ac. (iii) Only S and M. effects are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>Mean</th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>( M_2 )</th>
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<tbody>
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<td>493</td>
<td>404</td>
<td>332</td>
<td>410</td>
<td>324</td>
<td>456</td>
<td>449</td>
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<tr>
<td>( R_2 )</td>
<td>569</td>
<td>367</td>
<td>518</td>
<td>485</td>
<td>382</td>
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<td>( R_3 )</td>
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<td>429</td>
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<td>Mean</td>
<td>530</td>
<td>384</td>
<td>410</td>
<td>441</td>
<td>344</td>
<td>478</td>
<td>502</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 26.14 lb./ac.
S.E. of body of any table = 45.27 lb./ac.

Crop :- Jowar.
Site :- Agri. Res. Stn., Vijapur.
Object :- To find out the best method of cultivation for Jowar.

1. BASAL CONDITIONS:
(i) (a) No. (b) G.M. crop. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 29.8.1955. (iv) (a) N.A. (b) Seeds drilled. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Mulun. (vii) Irrigated. (viii) 2 interculturings.
2. TREATMENTS:
   1. 5 C.L./ac. of F.Y.M. + 40 lb./ac. of N as A/S in 2 doses + 20 lb./ac. of P₂O₅ in single dose; 24" spacing between rows + seed rate at 4 lb./ac.
   2. Manuring as in (1) with 18" spacing and seed rate at 10 lb./ac.
   3. Local method: No manuring with 9" spacing and seed rate at 25 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) 3. (b) N.A. (iii) 6. (iv) (a) 24" × 56' for 9" and 18" spacing, 22' × 56' for 24" spacing. (b) 18' × 50'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Not good. (ii) The crop was damaged slightly by birds. (iii) Weight of Jowar grain and fodder. (iv) (a) 1955—1957. (b) N.A. (c) No. (v) (a) and (b) N.A. (vi) The season was characterised by heavy rain which affected adversely the Kharif crops in general. (vii) Nil.

5. RESULTS:
   (i) 380 lb./ac. (ii) 93.19 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>384</td>
<td>365</td>
<td>391</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 38.05 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Site :-** Agri. Res. Stn., Vijapur.

**Object :-** To find out the best method of cultivation for Jowar.

---

**BASAL CONDITIONS :**
   (i) (a) Nil. (b) Cotton. (c) 8 C.L./ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 21.8.1956. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Malvan. (vii) Irrigated. (viii) N.A. (ix) 41'. (x) 4.12.1956.

2. TREATMENTS:
   Same as an expt. no. 55.60, on page 171.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 24" × 56' for 9" and 18" spacing and 24" × 56' for 24" spacing. (b) 18' × 50'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) The season was characterised by continuous rain. This resulted in excessive vegetative growth of crop which affected the grain yield considerably. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1072 lb./ac. (ii) 258.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>1172</td>
<td>1392</td>
<td>652</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 105.4 lb./ac.</td>
<td></td>
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</tr>
</tbody>
</table>
Crop: Jowar (Kharif).

Object: To find out suitable method of cultivation for Jowar.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Tur. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) 18.8.1957. (iv) (a) One ploughing, 4 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (vi) Nil. (vii) Malan. (viii) Unirrigated. (ix) One interculturing and two weedings. (x) 17". (x) 14.11.1957.

2. TREATMENTS:
   Same as in expt. no. 55(60) on page 171.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) 210' x 112'. (iii) 6. (iv) (a) 24' x 56' for 9" and 16" spacing and 22' x 56' for 24' spacing. (b) 18' x 50'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Due to want of rain treatment 2 was experiencing shortage of water and so grain development was poor. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955-57. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 662 lb./ac. (ii) 224.8 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

   Treatment  | 1  | 2  | 3  |
   Av. yield  | 582| 688| 716 |
   S.E./mean  |    |    | =91.8 lb./ac.

Crop: Jowar (Kharif).
Site: M.A.E. Farm, Umrala.

Ref: Gj. 57(MAE).
Type: 'CM'.

Object: Type VII.—To determine the optimum spacings for Jowar when different doses of N and P2O5 are applied.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar—Wheat. (b) Cotton. (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) 1st—2nd week of July, 1957. (iv) (a) 2 ploughings with country plough followed by two harrowings before sowing. (b) Drilling. (c) 6 lb./ac. (d) As per treatments. (e) —. (v) 5,000 lb./ac. of F.Y.M. (vi) Locally Irrigated. (vii) One weeding and interculturing. (ix) 23". (x) 1st—2nd week of October, 1957.

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 P2O5 as Super: P0 = 0, P1 = 20 and P2 = 40 lb./ac.
   (3) 3 spacings: Details—N.A.

3. DESIGN:
   (i) 3² Fact. confd. (ii) (a) 9; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 1/84.42 lb./ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Expt. during 1956 was not laid out according to plan.

5. RESULTS:
   (i) 487.3 lb./ac. (ii) 121.9 lb./ac. (iii) N and P effects are highly significant. Other effects are not significant.
   (iv) Av. yield of grain in lb./ac.
Object:—Type VIII—To determine the optimum spacing for Jowar when different doses of N and P₂O₅ are applied.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar—Wheat. (b) Cotton. (c) N.A. (ii) (a) Medium black soil. (b) N.A. (iii) Early July. (iv) (a) N.A. (b) Drilling. (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) Nil. (x) Early October.

2. TREATMENTS:
   Same as in expt. no. Gj. 57 (MAE) on Jowar crop on page 173.

3. DESIGN:
   (i) 3³ Fact. confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 1/201.7 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Experiment conducted during 1959-60 completely vitiated due to rainfall.

5. RESULTS:
   (i) 642 lb./ac. (ii) 257.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.
Crop: Jowar (Rabi).

Object: To see the effect of treating the seed with 2,4-D solutions for Jowar.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Dabhoi. (iii) 23.10.1954. (iv) (a) N.A. (b) Drilling. (c) 5 lb./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) Bhapiur. (vii) Irrigated. (viii) I interculturing and 1 weeding. (ix) Negligible (Rabi Season). (x) 21.3.1955.

2. TREATMENTS:
   1. Seed soaked in water for 30 minutes.
   2. Seed soaked in 0.01 p.p.m. 2-4-D for 30 minutes.
   3. Seed soaked in 0.10 p.p.m. 2-4-D for 30 minutes.
   4. Seed soaked in 1.00 p.p.m. 2-4-D for 30 minutes.
   5. Seed soaked in water for 5 hours.
   6. Seed soaked in 0.01 p.p.m. 2-4-D for 5 hours.
   7. Seed soaked in 0.10 p.p.m. 2-4-D for 5 hours.
   8. Control (no seed treatment).

3. DESIGN:
   (i) R.B.D. (ii) 8. (b) N.A. (iii) 4. (iv) (a) 42'×18'. (b) 36'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1031 lb./ac. (ii) 109.9 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<td>1068</td>
<td>1112</td>
<td>1177</td>
<td>961</td>
<td>953</td>
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<tr>
<td>S.E./mean</td>
<td>=54.95 lb./ac.</td>
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</table>

Crop: Jowar.

Object: To see the effect of hormone treatment of seeds on the growth and yield of Jowar.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 21.8.1954. (iv) (a) 2 harrowings as preparatory tillage. (b) Drilled by hand plough. (c) 10 lb./ac. (d) 3' between rows and thinning out at one-foot distance between plants. (e) N.A. (v) As per treatments. (vi) Jowar B.P-53. (vii) Unirrigated. (viii) One weeding, one thinning and two interculturings. (ix) 81.54°. (x) 17.2.1955.

2. TREATMENTS:
   All combinations of (1) and (2) + a control.
   (1) 2 periods of soaking seeds: T_1=30 minutes and T_2=5 hours.
   (2) 7 solutions: C_1 = water, C_2 = 2-4 D in 0.1 concentration, C_3 = 2-4 D in 1.0 conc., C_4 = 2-4 D in 10.0 conc., C_5 = I.A.A. 1.0 conc., C_6 = I.A.A. in 10.0 conc. and C_7 = I.A.A. in 100.0 conc.

3. DESIGN:
   (i) R.B.D. (ii) 15. (b) N.A. (iii) 4. (iv) (a) 42'×18'. (b) 36'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Due to continuous rainfall, Jowar growth was checked for want of interculturing. (ii) At early stages of growth, 60% of crop was attacked by stem borer. (iii) Periodical height and weight of kadbi were taken. (iv) (a) 1952—54. (b) No. (c) No. (v) (a) and (b) N.A. (vi) Season was abnormal. (vii) Nil.
5. RESULTS:
(i) 421.6 lb./ac. (ii) 55.46 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
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<td>395.8</td>
<td>376.6</td>
<td>434.3</td>
<td>429.0</td>
<td>475.2</td>
<td>394.3</td>
<td>420.3</td>
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<tr>
<td>T2</td>
<td>378.4</td>
<td>435.1</td>
<td>375.1</td>
<td>422.5</td>
<td>402.1</td>
<td>412.9</td>
<td>423.8</td>
<td>415.7</td>
</tr>
<tr>
<td>Mean</td>
<td>407.6</td>
<td>415.4</td>
<td>375.8</td>
<td>428.4</td>
<td>415.6</td>
<td>444.1</td>
<td>439.1</td>
<td>418.0</td>
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</tbody>
</table>

S.E. of T marginal mean = 10.48 lb./ac.
S.E. of C marginal mean = 19.61 lb./ac.
S.E. of body of table = 27.73 lb./ac.

Crop :- Bajra.
Object :- To study the effect of time and method of application of A/S to Bajra.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Nil. (c) Shallow, light black. (b) Refer soil analysis, Amreli. (iii) 25.6.1957. (iv) (a) One ploughing; two harrowings. (b) Drilling. (c) 5-6 lb./ac. (d) 6 x 36'. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Local—early. (vii) Unirrigated. (viii) 3 interculturings; 2 weedings. (ix) 28.77'. (x) 25.10.1957.

2. TREATMENTS:
40 lb./ac. of N in the form of A/S applied as follows:
1. Whole dose broadcast at sowing.
2. Drilled whole dose at sowing.
3. Broadcast 1/2 dose at sowing + 1/2 dose one month after sowing.
4. Drilled: 1/2 dose at sowing + 1/2 dose one month after sowing.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 2. (iv) (a) 24' x 27'. (b) 18' x 21'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of smut. (iii) Grain and fodder yield. (iv) (a) 1957—59. (b) No. (c) N.A. (v) (a) and (b) N.A. (vii) and (vii) N.A.

5. RESULTS:
(i) 829 lb./ac. (ii) 105.4 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

Treatment 1 2 3 4
Av. yield 857 756 857 846
S.E./mean = 74.55 lb./ac.

Crop :- Bajra.
Object :- To study the effect of time and method of application of A/S to Bajra.

1. BASAL CONDITIONS:
(i) Nil. (b) N.A. (c) N.A. (i) (a) Shallow, light black. (b) Refer soil analysis, Amreli. (iii) 2.7.1958. (iv) (a) One harrowing. (b) Hand sowing. (c) 2 lb./ac. (d) 6 x 36'. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Local—early. (vii) Unirrigated. (viii) 2 interculturings. (ix) 28.76'. (x) 19.10.1958.
2. TREATMENTS:
Same as in expt. no. 57(115) on page 176.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 34'×21'. (b) 28'×15'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.,

5. RESULTS:
(i) 1293 lb./ac. (ii) 82.24 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

Treatment

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S.E./mean =41.12 lb./ac.

Crop :- Bajra.

Object :-To study the effect of time and method of application of A/S to Bajra.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Shallow, light black. (b) Refer soil analysis, Amreli. (iii) 30.6.1959. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 2 lb./ac. (d) 36"×6". (e) N.A. (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P₂O₅. (vi) Local. (vii) Unirrigated. (viii) 2 weedings. (ix) 45.56". (x) 15.10.1959.

2. TREATMENTS:
Same as in expt. no. 57(115) on page 176.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 34'×21'. (b) 30'×15'. (v) 2'×3'. (vi) Yes.

4. GENERAL:
(i) Growth was normal but due to heavy rains at maturity the yield was affected. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1957—59. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rains in October. (vii) Nil.

5. RESULTS:
(i) 666 lb./ac. (ii) 74.73 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

Treatment

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<tr>
<td>1</td>
<td>567</td>
<td>583</td>
<td>785</td>
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</table>

S.E./mean =37.36 lb./ac.

Crop :- Bajra.

Object :-To find out the N and P₂O₅ requirements of Bajra.

1. BASAL CONDITIONS:
(i) (a) Bajra—wheat—groundnut—cotton. (b) Cotton. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 5.7.1954. (iv) (a) 3 harrowings. (b) Sowing by drilling. (c) 5 lb./ac. (d) 18" between rows. (e) N.A. (v) 5 C.L./ac. of F.Y.M. in the month of May. (vi) Mass selected. (vii) Unirrigated. (viii) Weeding and interculturing both thrice. (ix) 25". (x) 23.10.1954.
2. **TREATMENTS**:

All combinations of (1) and (2):

(1) 4 levels of $N_0 = 0$, $N_1 = 15$, $N_2 = 30$ and $N_3 = 45$ lb./ac.
(2) 4 levels of $P_0 = 0$, $P_1 = 15$, $P_2 = 30$ and $P_3 = 45$ lb./ac.

$N$ as A/S broadcast in single dose, $P_0$ as Super spread in single dose in furrows opened by drill.

3. **DESIGN**:

(i) 4$^2$ Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 39' x 21'. (b) 33' x 15'. (v) 2 rows on either side of each plot. (vi) Yes.

4. **GENERAL**:

(i) Good. (ii) Nil. (iii) Plot wise yield of grain and stalks. (iv) (a) 1951-54. (b) N.A. (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:

(i) 636.7 lb./ac. (ii) 98.4 lb./ac. (iii) Main effect of $N$ is highly significant. Main effect of $P$ and interaction $N \times P$ are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$P_3$</th>
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<td>525.4</td>
<td>737.0</td>
<td>761.9</td>
<td>636.0</td>
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</table>

Mean = 536.6

S.E. of any marginal mean = 24.59 lb./ac.
S.E. of body of table = 49.19 lb./ac.

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**Crop**: Bajra.  
**Site**: Agri. Res. Stn., Deesa.  
**Type**: 'M'.

Object: To find out a suitable time and method of application of A/S to Bajra.

1. **BASAL CONDITIONS**:

   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Coarse sandy loam. (b) Refer soil analysis, Deesa. (iii) 5-7.1956.  
   (iv) (a) N.A. (b) Drilling with 4-coultered drill. (c) 4 lb./ac. (d) Between rows—12' and between plants irregular. (e) N.A. (v) 3 C.L./ac. of F.Y.M. broadcast 15 days before sowing. (vi) Bajra—207. (vii) Unirrigated. (viii) Weeding on 28.8.1956 and interculturing on 11.8.1956. (ix) 35.39x. (x) 18.10.1956.

2. **TREATMENTS**:

1. Whole dose broadcast at sowing.
2. $\frac{1}{2}$ dose broadcast at sowing and $\frac{1}{2}$ dose one month after sowing.
3. Whole dose drilled at sowing.
4. $\frac{1}{2}$ dose drilled at sowing and $\frac{1}{2}$ dose drilled one month after sowing.
5. Whole dose broadcast 15 days prior to sowing.

Dose applied at 40 lb./ac. of N as A/S.

3. **DESIGN**:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 36' x 18'. (b) 30' x 12'. (v) 3' x 3'. (vi) Yes.

4. **GENERAL**:

(i) The grain setting was affected to a great extent by the incidence of pest. (ii) Serious attack of cockchafer beetle. The attack was practically even on the entire crop. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) and (c) No. (v) N.A. and (b) No. (vi) and (vii) Nil.

5. **RESULTS**:

(i) 201 lb./ac. (ii) 46.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
### Crop: Bajra  
**Site**: Agri. Res. Sta., Deesa.  
**Ref**: Gj. 57(15).  
**Type**: 'M'

Object: To find out a suitable time and method of application of A/S to Bajra.

1. **BASAL CONDITIONS**:
   - (i) (a) Nil.  
   - (b) *Guar*.  
   - (c) Nil.  
   - (ii) (a) Yellowish brown.  
   - (b) Refer soil analysis, Deesa.  
   - (iii) 23.7.1957.  
   - (iv) (a) One ploughing during February, 1957.  
   - (b) Drilling with 4 coultered drill.  
   - (c) 4 lb./ac.  
   - (d) Between rows—12' and between plants—irregular.  
   - (e) N.A.  
   - (v) 3 C.L./ac. of F.Y.M. broadcast 15 days before sowing.  
   - (vi) Bajra—207.  
   - (vii) Unirrigated.  
   - (viii) Two harrowings after rains.  
   - (ix) 14.57°.  
   - (x) 10.10.1957.

2. **TREATMENTS**:
   - Same as in exp. no. 56(16) on page 178.

3. **DESIGN**:
   - (i) R.B.D.  
   - (ii) (a) 5.  
   - (b) N.A.  
   - (iii) 5.  
   - (iv) (a) 36'×18'.  
   - (b) 30'×12'.  
   - (v) 3'×3'.  
   - (vi) Yes.

4. **GENERAL**:
   - (i) Satisfactory.  
   - (ii) Nil.  
   - (iii) Grain and fodder yield.  
   - (iv) (a) 1956—contd.  
   - (b) and (c) No.  
   - (v) (a) Talod.  
   - (b) N.A.  
   - (vi) and (vii) Nil.

5. **RESULTS**:
   - (i) 704 lb./ac.  
   - (ii) 235.6 lb./ac.  
   - (iii) Treatment differences are not significant.  
   - (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>864</td>
<td>682</td>
<td>696</td>
<td>772</td>
<td>504</td>
</tr>
</tbody>
</table>

S.E./mean = 105.3 lb./ac.

---

### Crop: Bajra  
**Site**: Agri. Res. Sta., Deesa.  
**Ref**: Gj. 58(8).  
**Type**: 'M'

Object: To find out a suitable time and method of application of A/S to Bajra.

1. **BASAL CONDITIONS**:
   - (i) (a) No.  
   - (b) *Bajra*-Tur.  
   - (c) Nil.  
   - (ii) (a) Yellowish brown.  
   - (b) Refer soil analysis, Deesa.  
   - (iii) 18.7.1958.  
   - (iv) (a) One ploughing and one harrowing.  
   - (b) Drilling.  
   - (c) 4 lb./ac.  
   - (d) 12' between rows.  
   - (e) N.A.  
   - (v) 3 C.L./ac. of F.Y.M. +20 lb./ac. of P₂O₅ as Super.  
   - (vi) Bajra—207.  
   - (vii) Unirrigated.  
   - (viii) One interculturing.—(ix) 14.13°.  
   - (x) 13.10.1958.

2. **TREATMENTS**:
   - Same as in exp. no. 56(16) on page 178.

3. **DESIGN**:
   - (i) R.B.D.  
   - (ii) (a) 5.  
   - (b) 90'×36'.  
   - (iii) 5.  
   - (iv) (a) 18'×36'.  
   - (b) 12'×30'.  
   - (v) 3'×3'.  
   - (vi) Yes.

4. **GENERAL**:
   - (i) Good.  
   - (ii) Nil.  
   - (iii) Grain yield.  
   - (iv) (a) 1956—contd.  
   - (b) No.  
   - (c) Nil.  
   - (v) (a) and (b) N.A.  
   - (vi) and (vii) Nil.
5. **RESULTS:**

(i) 1083 lb./ac. (ii) 159.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1119</td>
<td>1128</td>
<td>1027</td>
<td>1167</td>
<td>955</td>
</tr>
</tbody>
</table>

S.E./mean = 71.40 lb./ac.

---

**Crop:** Bajra.  
**Site:** Agri. Res. Stn., Halvad.  
**Ref:** Gj. 56(126).  
**Type:** 'M'.

Object:—To find out a suitable source of N with and without F.Y.M. for Bajra.

1. **BASAL CONDITIONS:**

(i) (a) Groundnut, Bajra—Cotton. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 11.7.1956. (iv) (a) Nil. (b) Drilling. (c) 5 lb./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 26.10.1956.

2. **TREATMENTS:**

Main-plot treatments:
- 2 levels of F.Y.M. : F0 = 0 and F1 = 2000 lb./ac.

Sub-plot treatments:
- 4 sources of 10 lb./ac. of N: S0 = Control (no nitrogen), S1 = Manure mixture, S2 = A/S, S3 = A/S N., and S4 = Urea.

3. **DESIGN:**

(i) Split-plot. (ii) (a) 2 main-plots, block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) a, 51' x 18'. (b) 45' x 12'. (v) 3' x 3'. (vi) Yes.

4. **GENERAL:**

(i) Normal. (ii) Blister attack. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**

(i) 301 lb./ac. (ii) (a) 149.9 lb./ac. (b) 52.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F0</td>
<td>298</td>
<td>297</td>
<td>313</td>
<td>325</td>
<td>284</td>
<td>303</td>
</tr>
<tr>
<td>F1</td>
<td>252</td>
<td>329</td>
<td>283</td>
<td>316</td>
<td>314</td>
<td>299</td>
</tr>
</tbody>
</table>

Mean: 301

S.E. of difference of two
1. F marginal means = 47.40 lb./ac.
2. S marginal means = 26.30 lb./ac.
3. S means at the same level of F = 37.19 lb./ac.
4. F means at the same level of S = 57.91 lb./ac.

---

**Crop:** Bajra.  
**Site:** Agri. Res. Stn., Halvad.  
**Ref:** Gj. 57(125).  
**Type:** 'M'.

Object:—To find out a suitable source of N with and without F.Y.M. for Bajra.
1. BASAL CONDITIONS:
   (i) (a) Cotton—Bajra—Wheat—Groundnut. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 2.7.1957. (iv) (a) Nil. (b) Drilling. (c) 5 lb./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) Bajra-28:15. (vii) Unirrigated. (viii) Nil. (ix) 15.09°. (x) 11.10.1957.

2. TREATMENTS:
   Same as in exp. no. 56(126) on page 180.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 40'x9'. (b) 36'x6'. (v) 2'x1.5'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 260 lb./ac. (ii) (a) 74.31 lb./ac. (b) 44.04 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F₀</td>
<td>266</td>
<td>251</td>
<td>266</td>
<td>231</td>
<td>227</td>
<td>248</td>
</tr>
<tr>
<td>F₁</td>
<td>283</td>
<td>266</td>
<td>276</td>
<td>272</td>
<td>270</td>
<td>273</td>
</tr>
<tr>
<td>Mean</td>
<td>274</td>
<td>258</td>
<td>271</td>
<td>251</td>
<td>248</td>
<td>260</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. F marginal means =19.19 lb./ac.
2. S marginal means =17.98 lb./ac.
3. S means at the same level of F =25.42 lb./ac.
4. F means at the same level of S =29.75 lb./ac.

Crop :- Bajra.


Ref :- Gj. 56(27).

Type :- ‘M’.

Object :- To find out suitable doses of N and P for Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) 40 lb./ac. of P₂O₅+40 lb./ac. of N. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 30.6.1956. (iv) (a) 2 harrowings. (b) Drilling. (c) 5 lb./ac. (d) 18"x4". (e) N.A. (v) Nil. (vi) Bajra-28:15. (vii) Nil. (vii) 2 interculturings. (ixii) 33.75°. (x) 18.10.1956.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of N as A/S: N₀=0 and N₁=10 lb./ac.
   (2) 4 levels of P₂O₅ as Super : P₀=0, P₁=4.5, P₂=9 and P₃=18 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 2. (iv) (a) 51'x18'. (b) 45'x12'. (v) 3'x3'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—N.A. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 266 lb./ac. (ii) 39.99 lb./ac. (iii) Main effect of N is significant. Main effect of P and interaction NxP are not significant. (iv) Av. yield of grain in lb./ac.
Crop :- Bajra.


Ref :- Gj. 57(29).

Type :- 'M'.

Object :- To find out suitable doses of N and P for Bajra.

1. BASAL CONDITIONS:

(i) (a) No. (b) Cotton. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 2.7.1957.

(iv) (a) Ploughing and harrowing. b) to (c) N.A. (v) Nil. (vi) Bajra—28—15. (vii) Irrigated. (viii) Thinning, interculturing and weeding. (ix) 15.09". (x) N.A.

2. TREATMENTS:

Same as in expt. no. 56(27) on page 181.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 560 sq. ft. (b) 255 sq. ft. (v) 2 rows on each side. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Ht. of plant, no. of earheads per plant, length of earhead and circumference of earhead. (iv) (a) 1956—contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

(i) 251 lb./ac. (ii) 45.80 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>234</td>
<td>259</td>
<td>211</td>
<td>231</td>
<td>234</td>
</tr>
<tr>
<td>N₁</td>
<td>259</td>
<td>269</td>
<td>251</td>
<td>294</td>
<td>268</td>
</tr>
<tr>
<td>Mean</td>
<td>247</td>
<td>264</td>
<td>231</td>
<td>263</td>
<td>251</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N =11.45 lb./ac.

S.E. of marginal mean of P =16.19 lb./ac.

S.E. of body of table =22.90 lb./ac.

---

Crop :- Bajra.


Ref :- Gj. 59(8).

Type :- 'M'.

Object :- To study the response of Bajra to application of micro-nutrients.
1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton. (b) Cotton. (c) 20 C.L./ac. of compost+50 lb./ac of manure mixture+24 lb./ac. of P$_2$O$_5_. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 12.7.1959. (iv) (a) 1 ploughing, 2 harrowings. (b) Drilling. (c) 7 lb./ac. (d) 18" between rows. (e)—. (v) 100 lb./ac. of N broadcast and 100 lb./ac. of P$_2$O$_5$ drilled before sowing. (vi) Bajra—28-15-2. (vii) Unirrigated. (viii) 2 interculturing and 4 weedicings. (ix) 34°. (x) 22.10.1959.

2. TREATMENTS:
   All combinations of (1), (2), (3), (4) and (5)
   1. 2 levels of Zinc as ZnSO$_4$: A$_0$=0 and A$_1$=ZnSO$_4$ at 9 lbs.+ Lime at 2 lbs.+100 gallons of water.
   2. 2 levels of Manganese as MnSO$_4$: B$_0$=0 and B$_1$=MnSO$_4$ at 3 lbs.+Lime at 2 lbs.+100 gallons of water.
   3. 2 levels of Copper as CuSO$_4$: C$_0$=0 and C$_1$=CuSO$_4$ at 8 lb./ac.+Lime at 8 lbs.+100 gallons of water.
   4. 2 levels of Molybdenum as Sodium Molybdate+CaCO$_3$: D$_0$=0 and D$_1$=Sodium Molybdate at 3 ozs.+100 gallons of water.
   5. 2 levels of Boron as Borax: E$_0$=0 and E$_1$=Borax at 2lbs.+ Bentonite at 0.5lb.+100 gallons of water.
   Total quantity of foliar spray is not available.

3. DESIGN:
   (i) 2² Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 3. (iv) (a) 30'x18'. (b) 24'x12'. (v) 3'x3'. (vi) Yes.

4. GENERAL:
   (i) Less yield due to rain. (ii) Slight attack of stem borer No control measures adopted. (iii) Grain yield. (iv) (a) 1959—contd. (b) and (c) N.A. (v) and (vii) Nil.

5. RESULTS:
   (i) 546.5 lb./ac. (ii) 361.1 lb./ac. (iii) None of the effects is significant. (iv) Table of mean and differential responses of grain yield in lb./ac.

### Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>−</td>
<td>+</td>
<td>−</td>
<td>+</td>
<td>−</td>
</tr>
<tr>
<td>A  −27.35</td>
<td>−</td>
<td>−</td>
<td>−64.47</td>
<td>9.77</td>
<td>−37.50</td>
</tr>
<tr>
<td>B  −30.12</td>
<td>−67.24</td>
<td>7.00</td>
<td>−</td>
<td>−63.62</td>
<td>−96.86</td>
</tr>
<tr>
<td>C  31.13</td>
<td>20.98</td>
<td>41.28</td>
<td>97.87</td>
<td>−35.61</td>
<td>72.53</td>
</tr>
<tr>
<td>D  6.05</td>
<td>52.87</td>
<td>−40.77</td>
<td>31.57</td>
<td>−19.47</td>
<td>47.45</td>
</tr>
<tr>
<td>E  2.08</td>
<td>−32.96</td>
<td>37.12</td>
<td>−36.11</td>
<td>40.27</td>
<td>−43.17</td>
</tr>
</tbody>
</table>

S.E. of mean response = 73.7 lb./ac.
S.E. of differential response = 104.2 lb./ac.

Crop: Bajra.  Ref: Gj. 57(46).

Object: To determine the dose of F.Y.M. required to maintain the fertility of soil as judged from the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Bajra.  (c) Nil. (ii) (a) Salty soil. (b) Refer soil analysis, Harij. (iii) 3.7.1957. (iv) (a) N.A.  (b) Drilling. (c) 10 lb./ac. (d) 18"x1". (e)—. (v) Nil. (vi) N.A.  (vii) Unirrigated. (viii) Nil. (ix) 8°. (x) 4.10.1957.

2. TREATMENTS:
   4 levels of F.Y.M.: F$_0$=0, F$_1$=5, F$_2$=10 and F$_3$=15 lb./ac.
   F.Y.M. spread on 3.7.1957.
3. DESIGN:
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 33' x 16'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Stunted growth.  (ii) Nil.  (iii) Grain and fodder yield.  (iv) (a) 1957—contd.  (b) N.A.  (c) No.
   (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 220 lb./ac.  (ii) 76.0 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>F₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>185</td>
<td>210</td>
<td>255</td>
<td>230</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=38.00 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop :- Bajra**
**Site :- Agri. Res. Stn., Harij.**
**Ref :- Gj. 58(36).**
**Type :- 'M'.**

Object:—To determine the dose of F.Y.M. required to maintain the soil fertility as judged from the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Bajra.  (c) Nil.  (ii) (a) Salty soil.  (b) Refer soil analysis, Harij.  (iii) 16.7.1958.  (iv)
   (a) 1 harrowing.  (b) Drilling.  (c) 10 lb./ac.  (d) 18' x 1'.  (e) —.  (v) Nil.  (vi) N.A.  (vii) Unirrigated.
   (viii) 1 hand weeding.  (ix) 13.77°.  (x) 25.10.1958.

2. TREATMENTS:
   4 levels of F.Y.M. : F₀=0, F₁=5, F₂=10 and F₃=15 lb./ac. F.Y.M. spread on 16.7.1958.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 33' x 16'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Very poor.  (ii) Nil.  (iii) Grain and fodder yield.  (iv) (a) 1957—contd.  (b) and (c) No.  (v) (a) and
   (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 77 lb./ac.  (ii) 22.32 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in
   lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>F₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>65</td>
<td>75</td>
<td>85</td>
<td>82</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=11.16 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop :- Bajra (Kharif).**
**Site :- Central Expt. Stn., Junagadh.**
**Ref :- Gj. 57(54).**
**Type :- 'M'.**

Object:—To study the methods of application of F.Y.M. and Ammo. Phos. to Bajra.

1. BASAL CONDITIONS:
   (i) (a) No.  (b) Groundnut.  (c) N.A.  (ii) (a) Medium black, 2' to 2½' deep.  (b) Refer soil analysis,
   Junagadh.  (iii) 29.6.1957.  (iv) (a) 2 to 3 harrowings.  (b) Drilling.  (c) About 5 lb./ac.  (d) 36' x 9'.  (e)
   N.A.  (f) Nil.  (g) Balsapuri (medium to late).  (vii) Unirrigated.  (viii) Thinning, gap filling, 2 weedic.
   (x) 30.21°.  (x) 26.10.1957.

2. TREATMENTS:
   1. Control.
   2. F.Y.M. at 5 tons/ac. applied in furrows.
   3. F.Y.M. at 5 tons/ac. spread evenly.
4. F.Y.M. at 5 ton/ac. applied at hills.
5. Ammo. Phos. (40 lb./ac. of N+50 lb./ac. of P₂O₅) applied in furrows.
6. Ammo. Phos. (40 lb./ac. of N+50 lb./ac. of P₂O₅) applied at hills.
F.Y.M. applied 15 to 20 days before sowing.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 50’×24’. (b) 44’×18’. (v) 3’×3’. (vi) Yes.

4. GENERAL:
(i) Good and healthy. No lodging. (ii) Nil. (iii) Height, caring dates and yield of grain. (iv) (a) 1957—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 651 lb./ac. (ii) 81.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grains 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>354</td>
<td>447</td>
<td>611</td>
<td>587</td>
<td>891</td>
<td>1015</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=40.8 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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

**Site :- Central Expt. Stn., Junagadh.**

Object :- To study the methods of application of F.Y.M. and Ammo. Phos. to Bajra.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 2.7.1958. (iv) (a) 2 harrowings. (b) Drilling. (c) 5 lb./ac. (d) 36” between rows. (e) . (v) Babapuri (late). (vi) Unirrigated. (vii) One weeding. (ix) 38.72”. (x) 20.11.1958.

2. TREATMENTS:
1. Control (no manure).
2. F.Y.M. at 10 C.L/ac. spread evenly.
3. F.Y.M. at 10 C.L/ac. applied in furrows.
4. F.Y.M. at 10 C.L/ac. applied at hills.
5. Ammo. Phos. (40 lb./ac. of N+50 lb./ac. of P₂O₅) applied in furrows after sowing.
6. Ammo. Phos. (40 lb./ac. of N+50 lb./ac. of P₂O₅) applied at hills in two doses before and after sowing.

3. DESIGN:
(i) L.Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 50’×24’. (b) 44’×18’. (v) 3’×3’. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—1958. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 930 lb./ac. (ii) 123.5 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grains 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>723</td>
<td>763</td>
<td>751</td>
<td>856</td>
<td>1210</td>
<td>1276</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=50.43 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) and (b) N.A. (iii) 18.7.1956. (iv) (a) 1 ploughing and 1 harrowing (b) Drilling. (c) 18 lb. ac. (d) 35' centre rows. (c) N.A. (v) Nil. (vi) Anrreli—medium. (vii) Unirrigated. (viii) 2 hoeings and 3 weeding. (ix) N.A. (x) 27.10.1956.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of F.Y.M. : $F_0=0$ and $F_1=200$ lb. ac.
   (2) 4 sources of 10 lb. ac. of $N$: $S_1=\text{urea mixture}$, $S_2=A/S$, $S_3=A.S.N.$ and $S_4=\text{urea}$.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 50'x18'. (b) 45'x12'. (v) 2.5'x3'. (vi) Yes.

4. GENERAL:
   (i) Fairly good. (ii) N.A. (iii) Grain yield. (iv) (a) N.A. (b) and (c) No. (v) (a) and (b) N.A. (vi) Nil. (vii) Raw data—N.A.

5. RESULTS:
   (i) 811 lb. ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb. ac.

<table>
<thead>
<tr>
<th></th>
<th>$S_0$</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
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<tr>
<td>$F_0$</td>
<td>680</td>
<td>760</td>
<td>860</td>
<td>970</td>
<td>740</td>
<td>802</td>
</tr>
<tr>
<td>$F_1$</td>
<td>820</td>
<td>765</td>
<td>955</td>
<td>850</td>
<td>710</td>
<td>820</td>
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<tr>
<td>Mean</td>
<td>750</td>
<td>762</td>
<td>908</td>
<td>910</td>
<td>725</td>
<td>811</td>
</tr>
</tbody>
</table>

S.E.'s $=\text{N.A.}$

Crop :- Bajra.
Object :- To study the response of Bajra to $P_2O_5$.

Ref :- Gj. 56(88).
Type :- 'M'.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) and (b) N.A. (iii) 17.7.1956. (iv) (a) 1 ploughing and one harrowing. (b) Drilling. (c) 12 lb. ac. (d) 36' between rows. (e) N.A. (v) Nil. (vi) Anrreli—medium. (vii) Unirrigated. (viii) 3 weeding and 2 hoeings. (ix) N.A. (x) 25.10.1956.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of $N$ : $N_0=0$ and $N_1=10$ lb. ac.
   (2) 4 levels of $P_2O_5$ : $P_0=0$, $P_1=4.5$, $P_2=9$ and $P_3=18$ lb. ac.
   N applied as A/S and $P_2O_5$ applied as Super.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 50'x18'. (b) 45'x12'. (v) 2.5'x3'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Raw data—N.A.

5. RESULTS:
   (i) 1006 lb. ac. (ii) and (iii) N.A. (iv) Av. yield of grain in lb. ac.
Object:—To find out the suitable time and method of application of A/S to Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy soil. (b) Refer soil analysis, Talod. (iii) 26.7.1955.
   (iv) (a) N.A. (b) Drilling. (c) 5 lb./ac. (d) 18" between rows. (e) N.A. (v) 5 C.L./ac. of F.Y.M. and 20 lb./ac. of P₂O₅. (vi) Bajra—207 (medium). (vii) Unirrigated. (viii) 2 interculturings. (ix) 27.20°. (x) 2.10.1955.

2. TREATMENTS:
   Same as in expt. no. 56(16) on page 178.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 36' x 18'. (b) 30' x 12'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
   (i) Germination was good and the stand was satisfactory. (ii) No attack of pests and diseases; damage due to seasonal abnormalities. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (b) and (c) No. (v) (a) Deesa. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 543 lb./ac. (ii) 46.02 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
   Treatment  
   1  2  3  4  5
   Av. yield 578 642 515 475 505
   S.E./mean 20.58 lb./ac.

Object:—To find out a suitable time and method of application of A/S to Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy soil. (b) Refer soil analysis, Talod. (iii) 29.5.1956.
   (iv) (a) N.A. (b) Drilling. (c) N.A. (d) 18" between rows. (e) N.A. (v) 5 C.L./ac. of F.Y.M. and 20 lb./ac. of P₂O₅. (vi) Bajra—207 (medium). (vii) Unirrigated. (viii) 3 interculturings. (ix) 32.66°.
   (x) 26.9.1956.

2. TREATMENTS:
   Same as in expt. no. 56(16) on page 178.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 36' x 18'. (b) 30' x 12'. (v) 3' x 3'. (vi) Yes.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain and fodder yield. (iv) [a] 1955—contd. (b) and (c) No. (v) [a] Deesa. [b] Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 1210 lb./ac. (ii) 176.9 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1140</td>
<td>1048</td>
<td>1328</td>
<td>1382</td>
<td>1154</td>
</tr>
</tbody>
</table>

S.E./mean = 79.1 lb./ac.


\[\text{Crop : Bajra.} \quad \text{Ref : Gj. 57(74).} \]
\[\text{Site : Agri. Res. Sta., Talod.} \quad \text{Type : 'M'.} \]

Object : To find out a suitable time and method of application of A/S to Bajra.

5. BASAL CONDITIONS:
(i) [a] No. (b) Groundnut. (c) Nil. (ii) [a] Sandy garada. (b) Refer soil analysis, Talod. (iii) 2.7.1957. (iv) [a] N.A. (b) Drilling. (c) 5 lb./ac. (d) 18' between rows. (e) N.A. [x] 5 C.L/ac. of \(\text{P}_2\text{O}_5\). (v) Bajra—207. (vi) Unirrigated. (vii) 3 interculturings and 1 weeding. (ix) 14.99w. (x) 22.9.1957.

2. TREATMENTS:


<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1339</td>
<td>1340</td>
<td>1306</td>
<td>1263</td>
<td>1415</td>
</tr>
</tbody>
</table>

S.E./mean = 54.6 lb./ac.


\[\text{Crop : Bajra.} \quad \text{Ref : Gj. 56(96).} \]
\[\text{Site : Agri. Res. Sta., Umrala.} \quad \text{Type : 'M'.} \]

Object : To study the effect of different manures on Bajra.

5. BASAL CONDITIONS:
(i) [a] Nil. (b) Cotton. (c) Nil. (ii) [a] Medium black. (b) Refer soil analysis, Umrala. (iii) 2.7.1956. (iv) [a] One ploughing, one harrowing. (b) Drilling. (c) 5 lb./ac. (d) 3' between rows. (x) N.A. [x] 20.10.1956.

2. TREATMENTS:


Main-plot treatments:
2 levels of F.Y.M.: \(\text{F}_0 = 0\) and \(\text{F}_1 = 2000\) lb./ac.
Sub-plot treatments:
2 levels of \( N \): \( N_0 = 0 \) and \( N_1 = 10 \) lb/acre.

Sub-sub-plot treatments:
4 sources of \( N \): \( S_1 = \) Manure mixture, \( S_2 = A/S, S_3 = A.S.N. \) and \( S_4 = Urea \).

F.Y.M. applied in furrows at sowing. \( N \) applied at sowing.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication, 2 sub-plots/main-plot; 4 sub-sub-plots/sub-plot. (b) N.A. (iii) 4. (iv) (a) 12' \times 24'. (b) 6' \times 18'. (v) 3' \times 3'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1286 lb/acre. (ii) (a) 351.7 lb/acre. (b) 148.4 lb/acre. (c) 224.5 lb/acre. (iii) None of the effects is significant. (iv) Av. yield of grain in lb/acre.

\[
N_0 S_1 = 1260 \text{ lb/acre}, \quad N_0 S_2 = 1223 \text{ lb/acre}, \quad N_0 S_3 = 1248 \text{ lb/acre}, \quad N_0 S_4 = 1292 \text{ lb/acre.}
\]

<table>
<thead>
<tr>
<th></th>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>( F_0 )</td>
<td>1248</td>
<td>1223</td>
<td>1235</td>
</tr>
<tr>
<td>( F_1 )</td>
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<td>Mean</td>
<td>1323</td>
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<td>1286</td>
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<table>
<thead>
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<th>( S_3 )</th>
<th>( S_4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F_0 )</td>
<td>1248</td>
<td>1185</td>
<td>1235</td>
<td>1273</td>
</tr>
<tr>
<td>( F_1 )</td>
<td>1449</td>
<td>1286</td>
<td>1298</td>
<td>1311</td>
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<tr>
<td>Mean</td>
<td>1348</td>
<td>1235</td>
<td>1267</td>
<td>1292</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. \( F \) marginal means = 62.2 lb/acre. 5. \( F \) means at the same level of \( N = 55.4 \) lb/acre.
2. \( N \) marginal means = 26.2 lb/acre. 6. \( S \) means at the same level of \( F = 74.2 \) lb/acre.
3. \( S \) marginal means = 56.1 lb/acre. 7. \( F \) means at the same level of \( S = 131.1 \) lb/acre.
4. \( N \) means at the same level of \( F = 52.5 \) lb/acre. 8. \( S \) means at the level of \( N_1 = 112.2 \) lb/acre.

---

**Crop:** Bajra (Kharif).

**Site:** Agri. Res. Sta., Umrala.

**Object:** To study the effect of \( N \) and \( P_2O_5 \) on the yield of Bajra.

**1. BASAL CONDITIONS:**
(i) (a) to (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 9.7.1956. (iv) (a) One ploughing, one harrowing. (b) Drilling. (c) 5 lb/acre. (d) 3' between rows. (e) —. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 4 interculturings, 2 weedings. (ix) N.A. (x) 16.10.1956.

**2. TREATMENTS:**
All combinations of (1) and (2)
1. 2 levels of \( N \): \( N_0 = 0 \) and \( N_1 = 10 \) lb/ac.
2. 4 levels of \( P_2O_5 \): \( P_0 = 0 \), \( P_1 = 4 \), \( P_2 = 9 \) and \( P_3 = 18 \) lb/ac.

\( N \) applied as A/S and \( P_2O_5 \) applied as Super on 9.8.1956.

**3. DESIGN:**
(i) Fact in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 18' \times 24'. (b) 12' \times 18'. (v) 3' \times 3'. (vi) Yes.

**4. GENERAL:**
(i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

**5. RESULTS:**
(i) 610.5 lb/acre. (ii) 98.61 lb/acre. (iii) None of the effects is significant. (iv) Av. yield of grain in lb/acre.
**Crop :- Bajra.**

**Site :- Agri. Res. Stn., Umrala.**

Object :- To study the effect of N and \( P_2 \)O\(_2\) on yield of Bajra.

1. **BASAL CONDITIONS :**
   (i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 2.7.1957. (iv) (a) Two ploughings and two harrowings. (b) to (e) N.A. (v) Nil. (vi) *Bajra* (local, early). (vii) Unirrigated. (viii) One thinning, 2 weedings and 1 interculturing. (ix) 34°. (x) 6.10.1957.

2. **TREATMENTS :** and 3. **DESIGN :**
   Same as in expl. n.o. 55,94) on page 189.

4. **GENERAL :**
   (i) Good. (ii) N.A. (iii) Height of plants, no. and length of tillers. (iv) (a) 1956-57. (b) and (c) N.A. (v) and (vi) Nil.

5. **RESULTS :**
   (i) 826 lb./ac. (ii) 142.6 lb./ac. (iii) Both the main effects and their interaction are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
<th>( P_3 )</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>( N_0 )</td>
<td>464</td>
<td>713</td>
<td>912</td>
<td>905</td>
<td>749</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>806</td>
<td>974</td>
<td>787</td>
<td>1045</td>
<td>903</td>
</tr>
<tr>
<td>Mean</td>
<td>635</td>
<td>844</td>
<td>850</td>
<td>975</td>
<td>826</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of \( N \) = 29.1 lb./ac.
S.E. of marginal mean of \( P \) = 41.2 lb./ac.
S.E. of body of table = 58.2 lb./ac.

---

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

**Site :- Agri. Res. Stn., Umrala.**

Object :- To find out optimum manurial requirement for Bajra.

1. **BASAL CONDITIONS :**
   (i) (a) N.A. (b) Cotton. (c) 20 lb./ac. of N as A.S. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 2.7.1957. (iv) (a) Tractor ploughing and two harrowings. (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Two harrowings and two weedings. (ix) 34°. (x) 7.10.1957.
2. TREATMENTS:

Main-plot treatments:
2 levels of F.Y.M.: \( F_0 = 0 \) and \( F_1 = 2000 \) lb./ac.

Sub-plot treatments:
4 sources of 10 lb./ac. of N: \( S_0 = \text{Control} \) (no manure), \( S_1 = \text{Manure mixture} \) (8 : 1 : 1), \( S_2 = \text{A.S}, S_3 = \text{Urea} \).

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block, 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12'x24' (b) 6'x18'. (v) 3'x3'. (vi) Yes.

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

5. RESULTS:
(i) 794 lb./ac. (ii) 156.2 lb./ac. (b) 139.7 lb./ac. (iii) Effect of S is highly significant and effect of F is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_0 )</th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( S_4 )</th>
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<td>740</td>
<td>784</td>
<td>675</td>
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<td>( F_1 )</td>
<td>652</td>
<td>1130</td>
<td>975</td>
<td>943</td>
<td>864</td>
<td>913</td>
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<tr>
<td>Mean</td>
<td>575</td>
<td>944</td>
<td>785</td>
<td>842</td>
<td>824</td>
<td>794</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. F marginal means \( = 49.4 \text{ lb./ac.} \)
2. S marginal means \( = 69.9 \text{ lb./ac.} \)
3. S means at the same level of F \( = 98.8 \text{ lb./ac.} \)
4. F means at the same level of S \( = 101.2 \text{ lb./ac.} \)

---

Crop : Bajra.
Object : To study the response of Bajra to application of micro-nutrients.

Ref :- Gj. 57(92).
Type :- 'M'.
### Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
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<tbody>
<tr>
<td>Zn</td>
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<td>-</td>
<td>34</td>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td>Mn</td>
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<td>-</td>
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<td>-40</td>
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<td>B</td>
<td>23.5</td>
<td>113</td>
<td>-66</td>
<td>-6</td>
<td>53</td>
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</tbody>
</table>

S.E. of mean response = 42.2 lb./ac.

S.E. of differential response = 59.8 lb./ac.

---

**Crop:** Bajra.

**Site:** Agri. Res. Stn., Vijapur.

**Object:** To study the response of the Bajra to application of micro-nutrients.

1. **BASAL CONDITIONS:**
   (i) Nil. (b) Cotton. (c) 49 lb./ac. of N as A/S. (ii) (a) Sandy loam. (b) N.A. (iii) 2.7.1958.
   (iv) (a) Two ploughings, one: harrowing. (b) Drilling. (c) 7 lb./ac. (d) 9" between rows. (e) N.A.
   (v) 100 lb./ac. of A/S+100 lb./ac. of Super. (vi) Bajra—207. (vii) Unirrigated. (viii) Two intercultivations

2. **TREATMENTS:**
   Same as in exp. no. 59(8) on page 182.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 18"×20". (b) 16"×15". (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) Growth in Repl. II and IV was below normal, colour of grain turned black. (ii) Nil. (iii) Length of
   ear heads, length, thickness of plant, no. of tillers, length of root, weight of one plant in each treatment.
   (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 1181 lb./ac. (ii) 269.8 lb./ac. (iii) None of the effects is significant. (iv) Table of mean and differential responses in lb./ac.

### Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
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</thead>
<tbody>
<tr>
<td>Zn</td>
<td>5.5</td>
<td>-</td>
<td>-46</td>
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<td>B</td>
<td>-47.0</td>
<td>-65</td>
<td>-29</td>
<td>-78</td>
<td>-16</td>
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</tbody>
</table>

S.E. of mean response = 47.7 lb./ac.

S.E. of differential response = 67.4 lb./ac.
Crop :- Bajra (Kharif).
Site :- Agri. Res. Stn., Vijapur.
Object :-To study the response of Bajra to application of micro-nutrients.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Light sandy. (b) N.A. (iii) 4.7.1959. (iv) (a) Nil. (b) Drilling. (c) 7 lb./ac. (d) 12" between rows. (e) —. (v) Nil. (vi) Bajra—207. (vii) Unirrigated. (viii) 4 interculturings and 1 weeding. (ix) 53.81". (x) 7.10.1959.

2. TREATMENTS :
   Same as in expt. no. 59(8) on page 182.

3. DESIGN :
   (i) 25 Fact. in R.B.D. (ii) (a) 32. (b) 144'x80'. (iii) 4. (iv) (a) 20'x18'. (b) 16'x15'. (v) 2'x1.5'. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956-59. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 325.3 lb./ac. (ii) 110.1 lb./ac. (iii) None of the effects is significant. (iv) Table of mean and differential responses in lb./ac.

   Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
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<td>Zn 18.23</td>
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<td>B -22.54</td>
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</table>

S.E. of mean response = 19.46 lb./ac.
S.E. of differential response = 27.52 lb./ac.

Crop :- Bajra (Kharif).
Site :- Agri. Res. Stn., Vijapur.
Object :-To determine the manurial requirements of Bajra.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) Light sandy. (b) N.A. (iii) 6.7.1958. (iv) (a) N.A. (b) Drilling. (c) 5 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Bajra—207. (vii) Irrigated. (viii) 2 weedings. (ix) 25.77". (x) 23.9.1958.

2. TREATMENTS :
   3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.
   N applied in 2 doses, 1st dose on 5.7.1958 and 2nd on 10.8.1958.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) 40'x45'. (iii) 6. (iv) (a) 40'x15'. (b) 36'x12'. (v) 2'x1.5'. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1958—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 850 lb./ac.  (ii) 75.27 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>817</td>
<td>875</td>
<td>857</td>
</tr>
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</table>

S.E./mean = 30.73 lb./ac.

---

Crop :- Bajra.  
Site :- Dry Farming Res. Stn., Jam Khabalia.  
Type :- 'MV'.

Object :-To find out optimum dose of N, P and K for different varieties of Bajra.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Groundnut.  (c) Nil.  (ii) (a) Shallow.  (b) N.A.  (iii) 10.7.1959.  (iv) (a) One ploughing, one harrowing.  (b) Drilling.  (c) 4 lb./ac.  (d) 3' between rows.  (e)--.  (v) Nil.  (vi) As per treatments  (vii) Unirrigated.  (viii) 2 interculturings.  (ix) 44'.  (x) 6.11.1959.

2. TREATMENTS:

Main-plot treatments:
All combinations of (1), (2) and (3)
(2) 3 levels of N as A/S top dressed : N₀=0, N₁=20 and N₂=40 lb./ac.
(3) 3 levels of P₂O₅ as Super drilled at sowing : P₀=0, P₁=20 and P₂=40 lb./ac.

Sub-plot treatments:
2 levels of K₂O : K₀=0 and K₁=40 lb./ac.
N as A/S top dressed, P₂O₅ as Super drilled at sowing and K₂O applied as Pot. Sul.

3. DESIGN:

(i) Split-plot confd.  (ii) (a) 3 blocks/replication, 9 main-plots/block, 2 sub-plots/main-plot.  (b) N.A.  (iii) One.  (iv) (a) 36'X21'.  (b) 30'X15'.  (v) 3'X3'.  (vi) Yes.

4. GENERAL:

(i) Not satisfactory.  (ii) Nil.  (iii) Grain and fodder yield.  (iv) (a) 1959—contd.  (b) No.  (c) Nil.  (v) (a) and (b) Rajkot.  (vi) and (vii) Nil.

5. RESULTS:

(i) 214 lb./ac.  (ii) (a) 142.5 lb./ac.  (b) 61.8 lb./ac.  (iii) Main effect of V alone is highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
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<td>114</td>
<td>452</td>
<td>152</td>
<td>161</td>
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<td>149</td>
<td>212</td>
<td>333</td>
<td>231</td>
<td>255</td>
<td>207</td>
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<tr>
<td>Mean</td>
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<td>162</td>
<td>375</td>
<td>170</td>
<td>190</td>
<td>283</td>
<td>214</td>
<td>225</td>
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<tr>
<td>K₀</td>
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<td>169</td>
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<td>K₁</td>
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<td>160</td>
<td>181</td>
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</table>
S.E. of difference of two
1. V, N or P marginal means = 47.5 lb./ac.
2. K marginal means = 16.8 lb./ac.
3. K means at the same level of V, N or P = 29.1 lb./ac.
4. V, N or P means at the same level of K = 73.2 lb./ac.

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

**Site :- Agri. Res. Stn., Amreli.**

Object :- To find out optimum spacing and seed rate for Bajra.

1. **BASEL CONDITIONS:**
   (i) (a) Bajra—Wheat—Groundnut—Cotton. (b) Cotton. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black.
   (b) Refer soil analysis, Amreli. (iii) 4.7.1954. (iv) (a) 3 harrowings. (b) By hand in furrow opened by
   ac. (c) and (d) As per treatments. (e) N.A. (v) 5 C.L./ac. of F.Y.M. In the month of May. (vi) Mass selection. (vii) Unirrigated. (viii) Weeding and interculturing twice. (ix) 25.08°. (x) 28.10.1954.

2. **TREATMENTS :**
   Main-plot treatments :
   4 spacings: S1 = 18", S2 = 24", S3 = 30" and S4 = 36".
   Sub-plot treatments :
   4 seed rates: R1 = 5, R2 = 10, R3 = 15 and R4 = 20 lb./ac.

3. **DESIGN :**
   (i) Split-plot. (ii) 4 main-plots/block, 4 sub-plots/main-plot. (iii) 4. (iv) (a) 36'×19' (S1), 34'×19' (S2),
   35'×19' (S3), 36'×19' (S4). (b) 30'×15' (v). 2 rows on either side for S1 and one row on either side for
   S2, S3 and S4. (vi) Yes.

4. **GENERAL :**
   (i) Fair. (ii) Nil. (iii) Yield of grain and stalk. (iv) (a) 1952—1954. (b) and (c) N.A. (v) a) and (b)
   N.A. (vi) and (vii) Nil.

5. **RESULTS :**
   (i) 471.2 lb./ac. (ii) (a) 219.3 lb./ac. (b) 113.4 lb./ac. (iii) Main effect of R is significant. Main effect
   of S and interaction S×R are 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>S4</th>
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<td>482.6</td>
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<td>504.9</td>
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<td>499.5</td>
<td>501.0</td>
<td>520.4</td>
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<td>379.9</td>
<td>435.6</td>
<td>509.7</td>
<td>430.8</td>
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<td>R4</td>
<td>337.4</td>
<td>353.8</td>
<td>476.3</td>
<td>547.9</td>
<td>428.8</td>
</tr>
</tbody>
</table>

Mean 447.4 411.9 473.5 552.2 471.2

S.E. of difference of two
1. S marginal means = 77.5 lb./ac.
2. R marginal means = 40.0 lb./ac.
3. R means at the same level of S = 145.2 lb./ac.
4. S means at the same level of R = 80.1 lb./ac.
1. **BASAL CONDITIONS:**

(i) (a) Cotton—*Bajra*—Groundnut. (b) Cotton. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 29, 30.6.1956. (iv) (a) N.A. (b) Hand drilling. (c) and (d) As per treatments. (v) N.A. (vi) 5 C.L./ac. of F.Y.M. spread one month before sowing. (vii) *Bajra* (early). (viii) Unirrigated. (ix) Two interculturings and one weeding. (ix) 26.96. (x) 12 to 14.10.1956.

2. **TREATMENTS:**

**Main-plot treatments:**
3 spacings: $S_1=3'$, $S_2=4'$ and $S_3=6'$.

**Sub-plot treatments:**
3 seed rates: $R_1=2$, $R_2=4$ and $R_3=6$ lb./ac.
Spacing between plants—irregular.

3. **DESIGN:**

(i) Split-plot. (ii) 3 main-plots/block, 3 sub-plots/main-plot. (iii) 6. (iv) (a) $45' \times 20'$ ($S_1$), $48' \times 20'$ ($S_2$). (b) $32' \times 18'$. (v) 5, 4 and 3 rows lengthwise for $S_1$, $S_2$, and $S_3$ respectively. 1' on either side breadthwise. (vi) Yes.

4. **GENERAL:**

(i) Below normal and lodging in October due to rains. (ii) Nil. (iii) Yield of grain and fodder. (iv) 1955—contd. (v) a. and (b) Nil. (vi) and (vii) Nil.

5. **RESULTS:**

(i) 620 lb./ac. (ii) 'a' 141.9 lb./ac. 'b' 150.9 lb./ac. (iii) Main effect of $R$ is significant. Main effect of $S$ and interaction $S \times R$ are not significant. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>Mean</th>
</tr>
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<td>620</td>
<td>700</td>
<td>689</td>
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<td>$R_2$</td>
<td>549</td>
<td>668</td>
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<tr>
<td>$R_3$</td>
<td>517</td>
<td>561</td>
<td>589</td>
<td>556</td>
</tr>
</tbody>
</table>

Mean 605 616 639 620

S.E. of difference of two

1. S marginal means =47.29 lb./ac.
2. R marginal means =50.29 lb./ac.
3. R means at the same level of $S$ =8.12 lb./ac.
4. S means at the same level of R =85.43 lb./ac.

**Crop:** Bajra (*Kharif*).

**Site:** Agri. Res. Stn., Amreli.

**Ref:** Gj. 57(9).

**Type:** 'C'.

**Object:** To find out optimum spacing and seed rate for Bajra.

1. **BASAL CONDITIONS:**

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 25.6.1957. (iv) a) 2 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Local. (vii) Unirrigated. (viii) 2 interculturings. (ix) 27.42. (x) 25.10.1957.

2. **TREATMENTS:**

Same as in expt. no. 566 on page 195.

3. **DESIGN:**

(i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot. (b) $120' \times 87'$ (iii) 6. (iv) (a) $40' \times 30'$. (b) $32' \times 18'$. (v) $4' \times 6'$. (vi) Yes.

4. **GENERAL:**

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) N.A.
5. RESULTS:

(i) 578 lb./ac.  
(ii) (a) 94.60 lb./ac.  
(b) 55.57 lb./ac.  
(iii) Main effects of S, R and interaction S x R are significant.  
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
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<th>S₂</th>
<th>S₃</th>
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<td>596</td>
<td>588</td>
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<td>R₂</td>
<td>522</td>
<td>621</td>
<td>629</td>
<td>591</td>
</tr>
<tr>
<td>R₃</td>
<td>503</td>
<td>570</td>
<td>592</td>
<td>555</td>
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</tbody>
</table>

Mean 523  606  606  578

S.E of difference of two

1. S marginal means =31.54 lb./ac.
2. R marginal means =18.53 lb./ac.
3. R means at the same level of S =32.07 lb./ac.
4. S means at the same level of R =41.00 lb./ac.

---

Crop : Bajra (Kharif).


Object : To find out optimum spacing and seed rate for Bajra.

1. BASAL CONDITIONS:

(i) (a) Nil.  
(b) and (c) N.A.  
(ii) (a) Shallow, light black.  
(b) Refer soil analysis, Amreli.  
(iii) 1.7.1958.  
(iv) (a) One harrowing.  
(b) Drilling.  
(c) and (d) As per treatments.  
(e) N.A.  
(v) 5 C.L./ac. of F.Y.M.  
(vi) Local.  
(vii) Unirrigated.  
(viii) 3 interculturings.  
(ix) 28.76".  
(x) 8.10.1958.

2. TREATMENTS:

Same as in expt. no. 56(6) on page 195.

3. DESIGN:

Same as in expt. no. 57(9) on page 196.

4. GENERAL:

(i) Normal.  
(ii) Nil.  
(iii) Yield of grain and fodder.  
(iv) (a) 1956—contd.  
(b) No.  
(c) Nil.  
(v) (a) and (b) N.A.  
(vi) and (vii) Nil.

5. RESULTS:

(i) 1636 lb./ac.  
(ii) (a) 191.1 lb./ac.  
(b) 156.9 lb./ac.  
(iii) None of the effects is significant.  
(iv) Av. yield of grain in lb./ac.

<table>
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</tbody>
</table>

Mean 1727  1615  1567  1636

S.E of difference of two

1. S marginal means =63.70 lb./ac.
2. R marginal means =52.31 lb./ac.
3. R means at the same level of S =90.60 lb./ac.
4. S means at the same level of R =97.62 lb./ac.

---
Crop: Bajra (Kharif).

Object: To find out the optimum spacing and seed rate for Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) As per treatments in exp. no. 56(15) on page 212+3 C.L./ac. of F.Y.M. (ii)
   (a) Yellowish brown. (b) Refer soil analysis, Deesa. (iii) 8.7.1957. (iv) (a) One ploughing. (b) Drilling-
   (c) and (d) As per treatments. (e) N.A. (v) 3 C.L./ac. of F.Y.M. spread by hand 15 days before sowing.

2. TREATMENTS:
   Main-plot treatments:
   3 spacings: \( S_1 = 12', S_2 = 18' \) and \( S_3 = 24' \).
   Sub-plot treatments:
   3 seed rates: \( R_1 = 4, R_2 = 6 \) and \( R_3 = 8 \) lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) [a] 3 main-plots/block, 3 sub-plots/main-plot. (iii) 6. (iv) (a) \( 36' \times 24' \) (\( S_1 \) and \( S_2 \))
   \( 36' \times 26' \) (\( S_3 \)). (b) \( 30' \times 18' \). (v) 3' at either end and 3, 2 and 2 rows on either side for
   \( S_1, S_2 \) and \( S_3 \) respectively. (vi) Yes.

4. GENERAL:
   (i) Below normal due to rains. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1956—contd. (b) No.
   (c) Nil. (v) (a) Amreli. (b) Nil. (vii) and (viii) Nil.

5. RESULTS:
   (i) 237 lb./ac. (ii) (a) 58.50 lb./ac. (b) 84.40 lb./ac. (iii) Main effect of \( S \) is significant. Main effect of
   \( R \) and interaction \( S \times R \) are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>( S_2 )</th>
<th>( S_3 )</th>
<th>Mean</th>
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<td>216</td>
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<tr>
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<td>289</td>
<td>192</td>
<td>216</td>
<td>232</td>
</tr>
<tr>
<td>( R_3 )</td>
<td>243</td>
<td>235</td>
<td>306</td>
<td>236</td>
</tr>
</tbody>
</table>

Mean: 236 208 265 237

S.E. of the difference of two
1. \( S \) marginal means
2. \( R \) marginal means
3. \( R \) means at the same level of \( S \)
4. \( S \) means at the same level of \( R \)

---

Crop: Bajra (Kharif).

Object: To find out the optimum spacing and seed rate for Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra—Tur. (c) Nil. (ii) (a) Yellowish brown. (b) Refer soil analysis, Deesa. (iii)
   26.7.1958. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) and (d) As per treatments. (e) N.A.

2. TREATMENTS:
   Same as in exp. no. 57(14) above.

3. DESIGN:
   (i) Split-plot. (ii) [a] 3 main-plots/block, 3 sub-plots/main-plot. (b) \( 108' \times 76' \). (iii) 6. (iv) (a) \( 24' \times 36' \)
   (\( S_1 \) and \( S_2 \)) and \( 26' \times 36' \) (\( S_3 \)). (b) \( 18' \times 30' \). (v) \( 3' \times 3' \) (\( S_1 \) and \( S_2 \)) and \( 4' \times 3' \) (\( S_3 \)). (vi) Yes.
4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 563.9 lb./ac. (ii) (a) 154.1 lb./ac. (b) 109.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.
   
<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>475.1</td>
<td>608.8</td>
<td>587.1</td>
<td>557.0</td>
</tr>
<tr>
<td>607.8</td>
<td>577.2</td>
<td>509.1</td>
<td>564.7</td>
</tr>
<tr>
<td>513.0</td>
<td>649.4</td>
<td>547.5</td>
<td>570.0</td>
</tr>
<tr>
<td>531.9</td>
<td>611.8</td>
<td>547.9</td>
<td>563.9</td>
</tr>
</tbody>
</table>

S.E. of difference of two
   1. S marginal means = 51.37 lb./ac.
   2. R marginal means = 36.33 lb./ac.
   3. R means at the same level of S = 62.92 lb./ac.
   4. S means at the same level of R = 72.63 lb./ac.

_Crop :- Bajra (Kharif).
Site :- Agri. Res. Stn., Halvad._

Object :- To find out the effect of different spacings on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 9.7.1954. (iv) (a) 1 harrowing. (b) Drilling. (c) 6 lb./ac. (d) As per treatments. (e) Nil. (v) 8 lb. of manure mixture drilled with seeds and 75 lb. of manure mixture top dressed on 1.8.1954. (vi) Bajra—28-15. (vii) Nil. (viii) 3 interculturings. (ix) N.A. (x) 12.10.1954.

2. TREATMENTS:
   2 spacings between lines: S1 = 18° and S2 = 36°.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 7. (iv) (a) 66’ x 24’. (b) 60’ x 18’. (v) 3’ x 3’. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Slight blister attack. (iii) Yield of grain. (iv) (a) 1954. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 290.0 lb./ac. (ii) 17.27 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>S1</th>
<th>S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>313.0</td>
<td>267.0</td>
</tr>
</tbody>
</table>

S.E./mean = 6.52 lb./ac.
1. BASAL CONDITIONS:
   (i) 'a: Nil. 'b' and 'c: N.A. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 11.7.1956.
   (iv) 'a: 2 harrowings. 'b: Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) 400 lb. of manure mixture + 400 lb. of castor cake + 300 lb./ac. of P₂O₅ broadcast. 320 lb. of manure mixture top dressed on 9.8.1956. (vi) Bajra-28-15. (vii) Nil. (viii) One interculturing. (ix) 33.75". (x) 3.10.1957.

2. TREATMENTS:
   5 spacings between plants: S₁ = 6", S₂ = 9", S₃ = 12", S₄ = 15" and S₅ = 18".
   Spacing between rows was 18" uniformly.

3. DESIGN:
   (i) L. Sq. (ii) 'a: 5. (b) N.A. (iii) 5. (iv) (a) 35' X 12'. (b) 29' X 7'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Height of plant, no. of earheads, length and circumference of earheads.
   (iv) 1956—N.A. (b) No. (c) Nil. (v) (a), and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1514 lb./ac. (ii) 128.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1574</td>
<td>1606</td>
<td>1518</td>
<td>1522</td>
<td>1350</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-57.2 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---


Object: To find out the effect of different spacings on yield of Bajra.

1. BASAL CONDITIONS:
   (i) 'a: No. 'b: Cotton. (c) 100 lb./ac. of manure mixture. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 3.7.1957. (iv) (a) Ploughing, harrowing. (b) and (c) N.A. (d) As per treatments. (e) N.A. (f) Bajra-28-15. (g) Irrigated. (h) Gap-filling, interculturing and weeding. (ix) 15.09". (x) N.A.

2. TREATMENTS:
   1. Control with seed drilled.
   2. Seed drilled.
   3. 6" spacing between plants.
   4. 9" spacing between plants.
   5. 12" spacing between plants.
   6. 15" spacing between plants.
   7. 18" spacing between plants.

   For treatments 2 to 7; 800 lb./ac. of manure mixture was given. For treatments 3 to 7 spacing between rows was 18" equally.

3. DESIGN:
   (i) R.B.D. (ii) 'a: 7. (b) N.A. (iii) 4. (iv) (a) 360 sq. ft. (b) 180 sq. ft. (v) One row on each side. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Height of plant, no. of earheads, length and circumference of earheads.
   (iv) 'a: 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 656.0 lb./ac. (ii) 100.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>669.0</td>
<td>658.0</td>
<td>722.0</td>
<td>710.0</td>
<td>787.0</td>
<td>728.0</td>
<td>321.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-50.21 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop := Bajra.  

Object := To find out a suitable spacing between rows and between plants for Bajra.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Cotton. (c) 50 lb./ac. of manure mixture. (d) 50 lb./ac. of A/S. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) N.A. (iv) (a) Ploughing, harrowing. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) Bajra-28-15. (vii) Irrigated. (viii) Gap filling, interculturings and weeding. (ix) 15.09°. (x) 2.7598.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 spacings between plants: S1 = 6", S2 = 9" and S3 = 12".
   (2) 3 spacings between rows: R1 = 18", R2 = 36" and R3 = 54".

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 540 sq. ft. (b) 324 sq. ft. (v) 3 rows on each side (R1), 1 on one side and 2 on the other (R2) and 1 on each side (R3). (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1956—contd. (b) No. (c) Nil (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 300.0 lb./ac. (ii) 57.03 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>300</td>
<td>267</td>
<td>332</td>
<td>300</td>
</tr>
<tr>
<td>S2</td>
<td>251</td>
<td>305</td>
<td>331</td>
<td>296</td>
</tr>
<tr>
<td>S3</td>
<td>323</td>
<td>277</td>
<td>308</td>
<td>303</td>
</tr>
<tr>
<td>Mean</td>
<td>291</td>
<td>283</td>
<td>324</td>
<td>300</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 16.46 lb./ac.  
S.E. of body of table = 28.51 lb./ac.

Crop := Bajra.  

Object := To find out if pre-monsoon sowing under irrigated conditions gives more yield for Bajra.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Cotton. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) As per treatments. (iv) (a) Harrowing. (b) to (e) N.A. (v) 100 lb./ac. of manure mixture before sowing. (vi) Bajra-28-15. (vii) Irrigated. (viii) Gap filling, interculturings and weeding. (ix) 15.09°. (x) N.A.

2. TREATMENTS:

3. DESIGN:
   (i) L-Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 40'x14'. (b) 34'x71'. (v) Two rows on each side. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Height of plant, no., length and circumference of earheads. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 210 lb./ac. (ii) 49.81 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.
### Crop: Bajra (Kharif).

**Site:** Agri. Res. Stn., Halvad.

**Object:** To find out the best date of sowing for Bajra.

#### 1. BASAL CONDITIONS:

- (i) (a) Legume-Cereal-Cotton. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad.  
- (iii) As per treatments.  
- (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 5 lb./ac.  
- (d) 18" between rows. (e) N.A. (v) 20 lb./ac. of manure mixture before sowing. (vi) Bajra—25-15-2. (vii) 18°.  

#### 2. TREATMENTS:

- 5 dates of sowing: 
  - D1 = 15.6.1958, 
  - D2 = 22.6.1958, 
  - D3 = 29.6.1958, 
  - D4 = 6.7.1958, 
  - D5 = 13.7.1958.

#### 3. DESIGN:

- (i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 40' X 14'. (b) 34' X 7'. (v) 3' X 3'. (vi) Yes.

#### 4. GENERAL:

- (i) Normal. (ii) Attack of leaf caterpillars. (iii) Yield of grain. (iv) (a) 1956—contd. (b) No. (c) Nil.
- (v) (a) Junagadh and Jamnagar. (b) N.A. (vi) As the plan of the expt. is not available it was analysed as R.B.D. (vii) Nil.

#### 5. RESULTS:

- (i) 267 lb./ac. (ii) 58.08 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>193</td>
<td>210</td>
<td>189</td>
<td>232</td>
<td>225</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td>22.26 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

---

### Crop: Bajra (Kharif).

**Site:** Dry Farming Res. Stn., Jam Khabamalia.

**Object:** To find out optimum spacing and seed rate for Bajra

#### 1. BASAL CONDITIONS:

- (i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Shallow. (b) N.A. (iii) 11.7.1959.  
- (iv) (a) One ploughing, two harrowings. (b) Drilling. (c) As per treatments. (e) N.A.  

#### 2. TREATMENTS:

- **Main-plot treatments:** 
  - 3 spacings between rows: 
    - S1 = 18', S2 = 36" and S3 = 54".

- **Sub-plot treatments:** 
  - 3 seed rates: 
    - R1 = 3, R2 = 4 and R3 = 5 lb./ac.

#### 3. DESIGN:

- (i) Split-plot. (ii) (a) 3 main-plots/block, 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 45' X 30'. (b) 39' X 24'. (v) 3' X 3'. (vi) Yes.

#### 4. GENERAL:

- (i) Not satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rains. (vii) Nil.
5. RESULTS:

(i) 72.52 lb./ac.  (ii) (a) 28.34 lb./ac.  (b) 27.32 lb./ac.  (iii) Main effects of S, R and interaction S×R are not significant.  (iv) Av. yield of grain in lb./ac.

\[
\begin{array}{c|ccc|c}
 & S_1 & S_2 & S_3 & \text{Mean} \\
\hline
R_1 & 81.83 & 76.55 & 79.50 & 79.29 \\
R_2 & 66.86 & 70.19 & 76.55 & 71.20 \\
R_3 & 46.38 & 83.15 & 71.67 & 67.07 \\
\hline
\text{Mean} & 65.02 & 76.63 & 75.91 & 72.52 \\
\end{array}
\]

S.E. of difference of two
1. S marginal means = 9.45 lb./ac.
2. R marginal means = 9.11 lb./ac.
3. R means at the same level of S = 15.77 lb./ac.
4. S means at the same level of R = 15.97 lb./ac.

---

**Crop**: Bajra (Kharif).

**Site**: Agri. Res. Stn., Porbandar.

Ref: Gj. 56(85).

Type: 'C'.

Object: To find out a suitable spacing between plants for Bajra.

---

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Bajra and castor.  (c) Nil.  (ii) (a) Medium.  (b) N.A.  (iii) 19.7.1956.  (iv) (a) 1 ploughing; 2 harrowings.  (b) Drilling.  (c) 12 lb./ac.  (d) As per treatments.  (e) N.A.  (v) Nil.  (vi) Amreli (medium).  (vii) Unirrigated.  (viii) 2 weedings and 1 interculturing.  (ix) N.A.  (x) 30.10.1956.

2. TREATMENTS:

2 spacings between rows: \( S_1 = 18" \) and \( S_2 = 36" \).

3. DESIGN:

(i) R.B.D.  (ii) (a) 2.  (b) N.A.  (iii) 12.  (iv) (a) 45' × 12'.  (b) 43' × 9'.  (v) 1' × 1.5'.  (vi) Yes.

4. GENERAL:

(i) Not good.  (ii) Nil.  (iii) Grain yield.  (iv) (a) and (b) N.A.  (c) Nil.  (v) (a) and (b) N.A.  (vi) Plotwise yield data N.A.  (vii) Nil.

5. RESULTS:

(i) 296.  (ii) to (iii) N.A.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>293</td>
<td>300</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = N.A.

---

**Crop**: Bajra.

**Site**: Agri. Res. Stn., Porbandar.

Ref: Gj. 57(107).

Type: 'C'.

Object: To find out a suitable spacing between plants for Bajra.

---

1. BASAL CONDITIONS:

(i) (a) N.A.  (b) Wheat.  (c) Nil.  (ii) (a) Medium.  (b) N.A.  (iii) 10.7.1957.  (iv) (a) Ploughing and 1 harrowing.  (b) Drilling.  (c) 50 lb./ac.  (d) As per treatments.  (e) N.A.  (v) 10 C.L./ac. of F.Y.M.  (vi) Medium.  (vii) Unirrigated.  (viii) 1 weeding and 1 interculturing.  (ix) N.A.  (x) 10.10.1957.

2. TREATMENTS:

Same as in exp. no. 56(85) above.
3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 50'x18'. (b) 45'x12'. (v) 2.5'x3'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) Nil. (b) N.A. (vi) Plotwise yield data N.A. (vii) Nil.

5. RESULTS:
   (i) 883 lb./ac. (ii) to (iii) N.A. (iv) Av. yield of grain in lb./ac.

   Treatment
   S1  S2
   Av. yield 900 866

   **Crop:** Bajra (Kharif)  
   **Site:** Agri. Res. Stn., Porbandar.

   Ref.:- Gj. 56(87).  
   Type :- 'C'.

Object:---To find out a suitable sowing date for Bajra.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Castor. (c) Nil. (ii) (a) Medium. (b) N.A. (iii) As per treatments. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 6 lb./ac. (d) 36'. (e) N.A. (v) 6 C.L./ac. of F.Y.M. in furrows. (vi) Amreli (medium). (vii) Unirrigated. (viii) 3 weedings and 2 interculturings. (x) N.A. (x) 28th October to 6th November according to treatments.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 36'x24'. (b) 30'x18'. (v) 3'x3'. (vi) Yes.

   **Crop:** Bajra (Kharif)  
   **Site:** Agri. Res. Stn., Umrala.

   Ref.:- Gj. 56(98).  
   Type :- 'C'.

Object:---To find out a suitable sowing date for Bajra.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Cotton and paddy. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) As per treatments. (iv) (a) 2 ploughings and 2 harrowings. (b) Dibbling. (c) 5 lb./ac. (d) 3'x3'. (e) 4-5 seeds/dibble. (v) 20 lb./ac. of N as manure mixture in 2 doses. (vi) N.A. (vii) Irrigated. (viii) 3 weedings and 2 interculturings. (ix) N.A. (x) 18.10.1956.

2. TREATMENTS:

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 36'x24'. (b) 30'x18'. (v) 3'x3'. (vi) Yes.
4. GENERAL:
(i) Not satisfactory. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Replication V gave very low yield and hence it is excluded from statistical analysis. (vii) Nil.

5. RESULTS:
(i) 408 lb./ac. (ii) 85.07 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>602</td>
<td>575</td>
<td>596</td>
<td>428</td>
<td>449</td>
<td>121</td>
<td>85</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Bajra.
Object: To find out suitable sowing date for Bajra.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) 40 lb./ac. of N as A/S. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) As per treatments. (iv) (a) 2 ploughings and 2 harrowings. (b) to (e) N.A. (v) 20 lb./ac. as manure mixture. (vi) Local (medium). (vii) Unirrigated. (viii) 3 weedings and thinning. (ix) 34°. (x) 30.9.1957.

2. TREATMENTS:

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) Nil. (iii) 5. (iv) (a) 36°×24'. (b) 30°×18'. (v) 3’×3’. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Height of plants, no. of effective tillers, length of ear head and grain yield.
(iv) (a) 1956—1957. (b) No.” (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 196 lb./ac. (ii) 92.68 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>D7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>260</td>
<td>301</td>
<td>420</td>
<td>163</td>
<td>152</td>
<td>50</td>
<td>24</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Bajra (Kharif).
Object: To find out suitable spacing between plants for better yield of Bajra.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 9.7.1956. (iv) (a) Nil. (b) Drilling. (c) 5 lb./ac. (d) As per treatments. (e) N.A. (v) 20 lb./ac. in the form of manure mixture in 2 doses. (vi) N.A. (vii) Unirrigated. (viii) 2 weedings, 1 interculturing and gap-filling. (ix) N.A. (x) 21, 22.10.1956.
2. TREATMENTS:
All combinations of (I) and (2)
(I) 3 spacings between rows: $R_1 = 18''$, $R_2 = 35''$ and $R_3 = 72''$.
(2) 3 spacings between plants: $S_1 = 6''$, $S_2 = 9''$ and $S_3 = 12''$.

3. DESIGN:
(i) Fact in R.B.D. (ii) (a) N.A. (iii) 6. (iv) (a) $36'x24'$. (b) $30'x12'$. (v) $3'x6'$. (vi) Yes.

4. GENERAL:
(i) Not satisfactory. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rain; germination not good. (vii) Nil.

5. RESULTS:
(i) 445 lb./ac. (ii) 169.9 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>529</td>
<td>388</td>
<td>529</td>
<td>482</td>
</tr>
<tr>
<td>$S_2$</td>
<td>328</td>
<td>469</td>
<td>464</td>
<td>420</td>
</tr>
<tr>
<td>$S_3$</td>
<td>489</td>
<td>373</td>
<td>434</td>
<td>432</td>
</tr>
<tr>
<td>Mean</td>
<td>449</td>
<td>410</td>
<td>476</td>
<td>445</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 40.0 lb./ac.
S.E. of body of table = 69.3 lb./ac.

---

Crop :- Bajra.


Object :- To find out a suitable spacing between plants for better yield of Bajra.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton. (c) 20 lb./ac. as manure mixture (8 : 1 : 1). (ii) (a) Medium black. (b) Refer soil analysis, Umrlala. (iii) 6-7.1957. (iv) (a) 2 ploughings, 2 harrowings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) 20 lb./ac. as manure mixture. (vi) Bajra local (early). (vii) Unirrigated. (viii) 2 weedings and interculturing. (ix) 34'. (x) 9.10.1957.

2. TREATMENTS: and 3. DESIGN:
Sam$^2$ as in exp. no. 56(97) o3 paga 205.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Height of plants, no. of effective tillers and grain yield. (iv) (a) 1955—1957. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 445 lb./ac. (ii) 100.5 lb./ac. (iii) Main effect of R is highly significant. Main effect of S is significant and interaction $S \times R$ is 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>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>618</td>
<td>522</td>
<td>357</td>
<td>499</td>
</tr>
<tr>
<td>$S_2$</td>
<td>457</td>
<td>591</td>
<td>274</td>
<td>441</td>
</tr>
<tr>
<td>$S_3$</td>
<td>468</td>
<td>475</td>
<td>247</td>
<td>397</td>
</tr>
<tr>
<td>Mean</td>
<td>514</td>
<td>529</td>
<td>293</td>
<td>447</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 23.69 lb./ac.
S.E. of body of table = 41.04 lb./ac.
Crop :- Bajra (Kharif).
Object :- To find out a suitable spacing between plants for better yield of Bajra.

1. BASAL CONDITIONS:
(i) (a) to (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 9.7.1956. (iv) (a) 1 harrowing. (b) Drilling. (c) 5 lb./ac. (d) As per treatments. (e) N.A. (v) 25 lb./ac. as manure mixture. (vi) N.A. (vii) Unirrigated. (viii) 2 weedings and 1 interculturing. (ix) N.A. (x) 25.10.1957.

2. TREATMENTS:
Spacing between plants: $S_1=6'$, $S_2=9'$, $S_3=12'$, $S_4=15'$ and $S_6=18'$.
Spacing between rows is 18' for all treatments.

3. DESIGN:
(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) $35' \times 12'$. (v) $29' \times 6'$. (vi) $3' \times 3'$. (vii) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Due to heavy rains the germination was very poor and hence resowing was done. (vii) Nil.

5. RESULTS:
(i) 864 lb./ac. (ii) 175.1 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
<th>$S_6$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1026</td>
<td>889</td>
<td>839</td>
<td>778</td>
<td>789</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$-78.28$</td>
</tr>
</tbody>
</table>

Crop :- Bajra (Kharif).
Object :- To compare departmental method to local method of Bajra cultivation.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) 30 lb./ac. of N as AJS. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 2.7.1957. (iv) (a) Tractor ploughing and 2 harrowings. (b) to (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) 2 interculturings and 2 weedings. (ix) 34°. (x) 7.10.1957.

2. TREATMENTS:
Same as in exp. no. 56(95) above.

3. GENERAL:
(i) Normal. (ii) Blister beetle. (iii) Height of plants and no. of tillers per plant, grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

4. RESULTS:
(i) 721 lb./ac. (ii) 86.72 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
<th>$S_6$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>836</td>
<td>779</td>
<td>709</td>
<td>690</td>
<td>590</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$-38.76$</td>
</tr>
</tbody>
</table>

Crop :- Bajra (Kharif).
Ref :- Gj. 56(95).
Type :- 'C'.

Crop :- Bajra (Kharif).
Ref :- Gj. 57(90).
Type :- 'C'.

Crop :- Bajra (Kharif).
Ref :- Gj. 56(7).
Type :- 'CM'.

Crop :- Bajra (Kharif).
Object :- To compare departmental method to local method of Bajra cultivation.
1. BASAL CONDITIONS:
(i) (a) Cotton—Bajra—Groundnut. (b) Cotton. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 7.7.1955. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 5 C.L./ac. of F.Y.M. spread one month before sowing. (vi) Local (early). (vii) Unirrigated. (viii) 2 interculturings and 2 thinnings. (ix) 26.96'. (x) 14. 10. 1956.

2. TREATMENTS:
1. Departmental method: Spacing between rows 3'. Seed rate 5 lb./ac. Top dressing with 40 lb./ac. of N as A/S and 20 lb./ac. of P2O5 as Super. A/S applied in two equal doses first at planting and second on 8.8.1958. Super spread at the time of sowing.
2. Local method: Spacing between rows 3' and covering the seeds by harrow.

3. DESIGN:
(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 33' X 18'. (b) 27' X 12'. (v) 3' around the plot. (vi) Yes.

4. GENERAL:
(i) Germination was normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (b) and (c) No. (v) (a) Deesa and Talod. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 308 lb./ac. (ii) 45.38 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>374</td>
<td>242</td>
</tr>
<tr>
<td>S.E.,mean</td>
<td>13.1 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

**Crop:** Bajra *(Kharif).*

**Site:** Agri. Res. Stn., Amreli.

**Object:** To compare departmental method to local method of Bajra cultivation.

5. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 25. 6. 1957. (iv) (a) N.A. (b) Drilling. (c) 5 lb./ac. (d) 3' between rows. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Local (E.M.S.). (vii) Unirrigated. (viii) 3 interculturings. (ix) 27.42'. (x) 25. 10. 1957.

2. TREATMENTS:
Same as in expt. no. 56(7) on page 207.

3. DESIGN:
(i) R. B. D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 33' X 18'. (b) 27' X 12'. (v) 3' around the plot. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 713 lb./ac. (ii) 145.5 lb./ac. (iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>881</td>
<td>546</td>
</tr>
<tr>
<td>S.E.,mean</td>
<td>42.0 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>
Crop: Bajra (Kharif).
Ref: Gj. 58(69).
Type: ‘CM’.

Object: To compare departmental method to local method of Bajra cultivation.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli.
   (iii) 2.7.1958. (iv) (a) N.A. (b) Drilling. (c) 5 lb./ac. (d) 36'. (e) —. (v) 5 C.L./ac. of F.Y.M. (vi) Local.

2. TREATMENTS:
   Same as in expt. no. 56(7) on page 207.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 10. (iv) (a) 33'x18'. (b) 30'x15'. (v) 1.5' around the plot.
   (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Grain and fodder yield. (iv) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A.
   (vi) and (vii) Crop in replication 1 and 12 was under water logged condition and hence yield data for these
   replications was not recorded. Hence 10 replications only.

5. RESULTS:
   (i) 1037 lb./ac. (ii) 146.8 lb./ac. (iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.
   Treatment 1 2
   Av. yield 1198 876
   S.E./mean = 42.4 lb./ac.

Crop: Bajra (Kharif).
Ref: Gj. 59(44).
Type: ‘CM’.

Object: To compare departmental method to local method of Bajra cultivation.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 30.6.1959.
   (iv) (a) 1 harrowing. (b) Drilling. (c) 2 lb./ac. (d) 36'. (e) —. (v) 5 C.L./ac. of F.Y.M. (vi) E.M.S.—
   local. (vii) Unirrigated. (viii) 1 intercultering. (ix) 45.56'. (x) 9.10.1959.

2. TREATMENTS:
   Same as in Expt. no. 56(7) on page 207.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 33'x18'. (b) 30'x15'. (v) 1.5' around the plot. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A.
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 437.5 lb./ac. (ii) 64.18 lb./ac. (iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.
   Treatment 1 2
   Av. yield 547 328
   S.E./mean = 18.53 lb./ac.
**Crop**: Bajra (*Kharif*).
**Site**: Agri. Res. Stn., Deesa.

**Object**: To compare departmental method to local method of Bajra cultivation.

1. **Basal Conditions**:
   - (i) (a) Nil. (ii) (a) Yellowish brown soil. (b) Refer soil analysis, Deesa. (iii) 15.8.1955. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (f) Nil. (g) 207. (h) Unirrigated. (i) 1 interculturing and 2 weedings. (j) N.A.

2. **Treatments**:
   - 1. Departmental method: Seed rate 4 lb./ac., spacing 15" between rows, 20 lb./ac. of N as A/Sand 20 lb./ac. of P2O5 as Super.
   - 2. Local method: Seed rate 8 lb./ac. with 12" spacing between rows.

3. **Design**:
   - (i) R.B.D. (ii) (a) 2. 'b' N.A. (iii) 12. (iv) (a) 42'-6"x20' (Dept.), 42'-6"x19' (Local). (b) 36'-3"x15'. (v) 3'-1.5"x2.5' (Dept.). (vi) 3'-1.5"x2' (Local). (vii) Yes.

4. **Results**:
   - (i) 50 lb./ac. (ii) 16.02 lb./ac. (iii) Treatments differ highly significantly (iv) Av. yield of grain in lb./ac. Treatment 1 2
     - Av. yield 41 59
     - S.E./mean = 4.63 lb./ac.

---

**Crop**: Bajra (*Kharif*).
**Site**: Agri. Res. Stn., Deesa.

**Object**: To compare departmental method to local method of Bajra cultivation.

1. **Basal Conditions**:
   - (i) 'a' Nil. 'b' Moth and Mug. (c) Nil. (i) (a) Coarse sandy loam. (b) Refer soil analysis, Deesa. (iii) 25.7.1956. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (f) Nil. (g) 207. (h) Unirrigated. (i) 1 weeding and 1 interculturing. (j) Yes.

2. **Treatments**:
   - Same as in expt. no. 55(18) above.

3. **Design**:
   - (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 42'-6"x20', 42'-6"x19'. (b) 36'-3"x15'. (v) 3'-1.5"x2'. (vi) Yes.

4. **General**:
   - (i) Normal. (ii) Attack of cock hopper beetle. The damage was not serious. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (b) and (c) No. (v) (a) Amreli and Talod. (b) Nil. (vi) and (vii) Nil.

5. **Results**:
   - (i) 206 lb./ac. (ii) 36.7 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac. Treatment 1 2
     - Av. yield 214 198
     - S.E./mean = 10.6 lb./ac.
Crop :- Bajra (Kharif).
Site :- Agri. Res. Stn., Deesa.

Object :- To compare departmental method to local method of Bajra cultivation.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar fodder. (c) Nil. (ii) (a) Yellowish loam. (b) Refer soil analysis, Deesa. (iii) 6.7.1957. (iv) (a) One ploughing during February. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 3 C.L./ac. of F.Y.M. spread by hand. (vi) 207. (vii) Unirrigated. (viii) One harrowing after rain. (ix) 14.57°. (x) 8.10.1957.

2. TREATMENTS:
   Same as in expt. no. 55(18) on page 210. Manure spread by hand on 4.7.1957.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 42'6"X20', 42'6"X19'. (b) 38'3"X15'. (v) 3'-1½" along length and 4 rows along breadth. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955—contd. (b) and (c) No. (v) (a) Amreli and Talod. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 569 lb./ac. (ii) 133.7 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>460</td>
<td>678</td>
</tr>
<tr>
<td>S.E./mean = 38.6 lb./ac</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Crop :- Bajra (Kharif).
Site :- Agri. Res. Stn., Dessa.

Object :- To compare departmental method to local method of Bajra cultivation.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra-Tur. (c) Nil. (ii) (a) Yellowish brown. (b) Refer soil analysis, Dessa. (iii) 23.7.1958. (iv) (a) One ploughing and one harrowing. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 3 C.L./ac. of F.Y.M. (vi) N.A. (vii) Unirrigated. (viii) 1 interculturing. (ix) 14.13°. (x) 15.10.1958.

2. TREATMENTS:
   Same as in expt. no. 55(18) on page 210.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) 120'X42½'. (iii) 12. (iv) (a) 20'X42½'. (b) 15'X36½'. (v) 2½'X3.13'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 829 lb./ac. (ii) 112.9 lb./ac. (iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>709</td>
<td>948</td>
</tr>
<tr>
<td>S.E./mean = 32.6 lb./ac</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop :- Bajra (Kharif).
Site :- Agri. Res. Sta., Deesa.

Object :- To compare departmental method to local method of Bajra cultivation.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Bajra. (c) C.L./ac. of F.Y.M. and as per treatments. (ii) (a) N.A. (b) Refer soil analysis, Deesa. (iii) 19 to 23.7.1956. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 3 C.L./ac. of F.Y.M. broadcast 15 days before sowing. (vi) (a) N.A. (b) Refer soil analysis, Dessa. (vii) 19 to 23.7.1956. (viii) (a) N.A. (b) Refer soil analysis. (c) and (d) As per treatments. (e) N.A. (v) 3 C.L./jac. of F.Y.M. broadcast 15 days before sowing. (vi) (a) N.A. (b) Refer soil analysis. (c) and (d) As per treatments. (e) N.A. (vii) 19 to 23.7.1956. (viii) 3 C.L./jac. of F.Y.M. broadcast 15 days before sowing. (ix) 35.39°. (x) 22 to 24.11.1956.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2)
(1) Spacing between rows: S_1 =24", S_2 =36" and S_3 =48".
(2) Seed rate: R_1 =2, R_2 =4, R_3 =6 and R_4 =8 lb./ac.

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_2O_5: P_0 =0 and P_1 =30 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) l2 main-plots/block ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 44' x 32' for 24", 48" spacing and 44' x 30' for 36" spacing. (b) 36' x 24'. (c) and (d) As per treatments. (e) N.A. (v) 3 C.L./jac. of F.Y.M. broadcast 15 days before sowing. (vi) (a) N.A. (b) Refer soil analysis. (c) and (d) As per treatments. (e) N.A. (vii) (a) N.A. (b) Refer soil analysis. (c) and (d) As per treatments. (e) N.A. (viii) 3 C.L./jac. of F.Y.M. broadcast 15 days before sowing. (ix) 35.39°. (x) 22 to 24.11.1956.

4. GENERAL:
(i) Normal. (ii) There was attack of cock hopper beetle on the crop. It was controlled by light trapping hence it was not serious. (iii) Grain yield. (iv) (a) 1956 —cond. (b) Yes. (c) No. (v) (a) Niphad, Talod. (b) Nil. (vi) Yes. (vii) Nil.

5. RESULTS:
(i) 315 lb./ac. (ii) (a) 176.6 lb./ac. (b) 107.3 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>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>Mean</th>
<th>R_1</th>
<th>R_2</th>
<th>R_3</th>
<th>R_4</th>
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</tr>
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</tbody>
</table>

S.E. of difference of two
1. S marginal means =18.0 lb./ac. 8. S means at the same level of P =29.8 lb./ac.
2. R marginal means =20.8 lb./ac. 9. N means at the same level of R =31.0 lb./ac.
3. N marginal means =10.9 lb./ac. 10. R means at the same level of N =38.8 lb./ac.
4. P marginal means =8.9 lb./ac. 11. P means at the same level of R =25.3 lb./ac.
5. N means at the same level of S =26.8 lb./ac. 12. R means at the same level of P =34.5 lb./ac.
6. S means at the same level of N =33.6 lb./ac. S.E. of body of S×R table =36.0 lb./ac.
7. P means at the same level of S =21.9 lb./ac. S.E. of body of N×P table =15.5 lb./ac.
1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton. (b) Cotton. (c) Nil. (ii) (a) Medium black with poor fertility. (b) Refer soil analysis, Halvad. (iii) 19.7.1958. (iv) (a) 2 harrowings. (b) Dibbling. (c) to (e) Nil. (v) Nil. (vi) Bajra—28-15-2. (vii) Irrigated. (viii) 2 interculturings and 1 weeding. (ix) 13°. (x) 2.10.1958.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 row spacings: S1 = 18", S2 = 36" and S3 = 54".
   (2) 3 plant spacings: C1 = 6", C2 = 9" and C3 = 12".
   (3) 3 doses of manures: M0 = Control, M1 = 20 lb. ac. of N + 10 lb. ac. of P2O5 and M2 = 40 lb. ac. of N + 20 lb. ac. of P2O5.

   P2O5 broadcast before sowing. N applied in two equal doses, one before sowing and the other one month after sowing.

3. DESIGN:
   (i) 3² confounding SCM and SCM² effects. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 40" ± 18". (b) 34" ± 9". (v) 3" ± 4.5". (vi) Yes.

4. GENERAL:
   (i) Not satisfactory due to scanty rains. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) N.A. (c) No. (v) (a) Junagadh, Umrala. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 501 lb./ac. (ii) 70.89 lb./ac. (iii) Main effects of S and M are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
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<td>401</td>
<td>495</td>
<td>474</td>
<td>526</td>
<td>484</td>
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<tr>
<td>705</td>
<td>670</td>
<td>563</td>
<td>646</td>
<td>616</td>
<td>650</td>
<td>671</td>
</tr>
<tr>
<td>Mean</td>
<td>562</td>
<td>531</td>
<td>410</td>
<td>501</td>
<td>492</td>
<td>512</td>
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<td>554</td>
<td>490</td>
<td>452</td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 16.71 lb./ac.
S.E. of body of any table = 28.74 lb./ac.

Crop: Bajra (Kharif).
Object:—To assess the best combination of spacing between rows and plants with optimum dose of N and P for Bajra.

1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton. (b) Cotton. (c) 13 C.L./ac. of compost and 44 lb./ac. of manure mixture. (ii) (a) Medium black with poor fertility. (b) Refer soil analysis, Halvad. (iii) 3.7.1959. (iv) (a) 1 harrowing. (b) Dibbling. (c) and (d) N.A. (e) 3-4 seeds/dibble. (v) Nil. (vi) Bajra—28-15-2. (vii) Unirrigated. (viii) 2 interculturings and 4 weedings. (ix) About 34°. (x) 24.10.1959.
2. TREATMENTS:

All combinations of (1), (2) and (3)
(1) 3 row spacings: \( S_1 = 18" \), \( S_2 = 36" \) and \( S_3 = 54" \).
(2) 3 plant spacings: \( C_1 = 6" \), \( C_2 = 9" \) and \( C_3 = 12" \).
(3) 3 doses of manures: \( M_0 = \) control, \( M_1 = 10 \) lb./ac. of \( P_2O_5 \) and \( M_2 = 20 \) lb./ac. of \( N + 10 \) lb./ac. of \( P_2O_5 \).

3. DESIGN:

(i) 3 partially confounding SCM and SCM\(^2\) effects. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A.
(iii) 2. (iv) (a) 40' \times 18'. (b) 34' \times 9'. (v) 3' \times 4.5'. (vi) Yes.

4. GENERAL:

(i) Due to rains immediately after sowing the germination was poor. (ii) Slight attack of stem-borer and blisters. (iii) Grain yield. (iv) (a) 1958—contd. (b) and (c) No. (v) (a) Junagadh, Umrala, Jamnagar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 310 lb./ac. (ii) 57.79 lb./ac. (iii) Main effect of M and interaction \( M \times S \) are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>Mean</th>
<th>( C_1 )</th>
<th>( C_2 )</th>
<th>( C_3 )</th>
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<td>286</td>
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<td>( M_2 )</td>
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<td>547</td>
<td>332</td>
<td>381</td>
<td>387</td>
<td>367</td>
<td>388</td>
</tr>
<tr>
<td>Mean</td>
<td>336</td>
<td>301</td>
<td>293</td>
<td>310</td>
<td>328</td>
<td>302</td>
<td>300</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 13.62 lb./ac.
S.E. of body of any table = 23.60 lb./ac.

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Crop:—Bajra (Kharif).

Site:—Agri. Res. Farm, Jamnagar.

Object:—To compare different methods of cultivation for Bajra.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 28. 7. 1956. (iv) "x" N.A. (b) As per treatment. (c) and (d) N.A. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 29.03". "x". 24. 10. 1956.

2. TREATMENTS:

3 methods of cultivation:
1. Russian method: Hand sowing at \( 3' \times 3' \) spacing and applying 5 C.L./ac. of F.Y.M.
2. Local method (i): Drilling at 18" spacing.
3. Local method (ii): Drilling at 18" spacing and applying 5 C.L./ac. of F.Y.M.

3. DESIGN:

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

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) and (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) Raw data N.A.
5. RESULTS:
(i) 170 lb./ac. (ii) N.A. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th>Treatment</th>
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<th>2</th>
<th>3</th>
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<tbody>
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<td>120</td>
<td>190</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>N.A.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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

**Site :- Agri. Res. Farm, Jamnagar.*

Object :- To find out optimum manurai and spacing requirements of Bajra.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) N.A. (iii) 26.6.1958. (iv) (a) One ploughing and one harrowing. (b) Hand sowing. (c) N.A. (d) As per treatments. (e)—. (v) Nil. (vi) Local—1. (vii) Nil. (viii) Two interculturings. (ix) 28.42". (x) 21.10.1958.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 spacings between rows: $S_1=18"$, $S_2=36"$ and $S_3=54"$.
(2) 3 spacings between plants: $C_1=6"$, $C_2=9"$ and $C_3=12"$.
(3) 3 manurial doses: $M_0=0$, $M_1=20$ lb./ac. of $N+10$ lb./ac. of $P_2O_5$ and $M_2=40$ lb./ac. of $N+20$ lb./ac. of $P_2O_5$.

N as A/S broadcast in two doses; 1st at sowing and 2nd after six weeks. $P_2O_5$ as Super drilled before sowing.

3. DESIGN:
(i) 3^3 confd. (ii) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 40'x18'. (b) 34'x9'. (v) 3'x4.5'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) Nil.

5. RESULTS:
(i) 253 lb./ac. (ii) 46.62 lb./ac. (iii) Main effects of $S$ and $M$ are highly significant. Interaction $S \times F$ is significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>$C_1$</th>
<th>$C_2$</th>
<th>$C_3$</th>
<th>Mean</th>
<th>$M_0$</th>
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<td>249</td>
</tr>
<tr>
<td>198</td>
<td>289</td>
<td>228</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 10.99 lb./ac.
S.E. of body of any table = 19.04 lb./ac.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Clay loam to medium black. (b) N.A. (iii) 27.6.1959. (iv) (a) 2 ploughings and 2 harrowings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) 1 weeding and 1 interculturing. (ix) 30°. (x) 16.10.1959.

2. TREATMENTS:
   Same as in expt. no. 58(116) on page 215.

3. DESIGN:
   (i) 3^3 Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) 40'x15'. (b) 34'x9'. (v) 3' around. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) Junagadh, Umrala, Porbandar. (b) N.A. (vi) and (vii) Nil.

5. RESULT:
   (i) 337 lb./ac. (ii) 79.71 lb./ac. (iii) Main effects of S and M and interaction SM are highly significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
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<td>295</td>
<td>337</td>
<td>164</td>
<td>285</td>
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</tbody>
</table>

S.E. of any marginal mean = 18.79 lb./ac.
S.E. of body of any table = 32.55 lb./ac.

Crop :- Bajra (Kharif).  
Site :- Central Expt. Stn., Junagadh.  
Object :- To find out optimum manurial and spacing requirements of Bajra.  
Type :- 'CM'.

Ref :- Gj. 58(86).

Crop :- Bajra (Kharif).  
Site :- Central Expt. Stn., Junagadh.  
Object :- To find out optimum manurial and spacing requirements of Bajra.  
Type :- 'CM'.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 8.7.1958. (iv) (a) N.A. (b) Hand sowing. (c) 5 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Babapuri. (vii) N.A. (viii) N.A. (ix) 38.72°. (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 58[116] on page 215.

3. DESIGN:
   (i) 3^3 confd. (ii) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 40'x18'. (b) 34'x9'. (v) 3'x4.5'. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1958—contd. (b) N.A. (c) No. (v) a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1061 lb./ac. (ii) 175.5 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in lb./ac.
Crop :- Bajra (Kharif).

Site :- Central Expt. Stn., Junagadh.

Ref :- Gj. 59(81).

Type :- 'CM'.

Object :- To find out the optimum manurial and spacing requirements of Bajra.

1. BASAL CONDITIONS
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 30.6.1956. (iv) (a) N.A. (b) Drilling. (c) 5 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Babapuri. (vii) Unirrigated. (viii) N.A. (ix) 60"A². (x) N.A.

2. TREATMENTS :
   Same as in expt. no. 58(116) on page 215.

3. DESIGN :
   (i) 3³ confd. (ii) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 40' x 18'. (b) 24' x 9'. (v) 3' x 4.5'. (vi) Yes.

4. GENERAL :
   (i) Not satisfactory. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1958—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 504 lb./ac. (ii) 87.69 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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<th>M₀</th>
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<td>1108</td>
<td>1160</td>
<td>946</td>
<td>1071</td>
<td>1011</td>
<td>990</td>
</tr>
<tr>
<td>C₃</td>
<td>1042</td>
<td>1001</td>
<td>1083</td>
<td>1042</td>
<td>950</td>
<td>1061</td>
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<tr>
<td>Mean</td>
<td>1063</td>
<td>1085</td>
<td>1035</td>
<td>1061</td>
<td>954</td>
<td>1054</td>
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<tr>
<td>M₀</td>
<td>929</td>
<td>999</td>
<td>934</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>M₁</td>
<td>1033</td>
<td>1090</td>
<td>1013</td>
<td></td>
<td></td>
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<tr>
<td>M₂</td>
<td>1229</td>
<td>1166</td>
<td>1159</td>
<td></td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 41.38 lb./ac.
S.E. of body of any table = 71.67 lb./ac.
Crop :- Bajra (Kharif).

Site :- Agri. Res. Stn., Talod.

Ref :- Gj. 55(56).

Type :- 'CM'.

Object :- To find out a suitable method of cultivation for Bajra.

I. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow pastures. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Talod. iii 24.7.1955.

(iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 5 C.L. ac. of F.Y.M. (vi) Bajra - 207 (medium). (vii) Unirrigated. (viii) 1 interculturing and 1 weeding. (ix) 27.20. (x) 18.10.1955.

2. TREATMENTS:

2 methods of cultivation:

1. Departmental method: 40 lb./ac. of N in two equal doses and 20 lb./ac. of P2O5 as a single dose.

Seed rate = 4 lb./ac. with 15” spacing.

2. Local method: Seed rate = 5 lb./ac. with 12” spacing.

3. DESIGN:

(i) R.B.D. (ii) a 2. b, N.A. (iii) 12. (iv) a, 114’x10’. (b) 108’x5’. (v) 3’x2.5’. (vi) Yes.

4. GENERAL:

(i) Patchy germination and poor setting. (ii) Nil. (iii) Grain and fodder yield. iv, a, 1955—contd. (b) and (c) No. (v) A, Amreli and Desha. (b) N.A. (vi) 40” damage due to seasonal abnormalities. (vii) Nil.

5. RESULTS:

(i) 156 lb./ac. (ii) 32.21 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>212</td>
<td>101</td>
</tr>
</tbody>
</table>

S.E., mean = 9.30 lb./ac.

Crop :- Bajra (Kharif).

Site :- Agri. Res. Stn., Talod.

Ref :- Gj. 56(67).

Type :- 'CM'.

Object :- To find out a suitable method of cultivation for Bajra.

I. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy. (b) Refer soil analysis, Talod. (iii) 28.6.1956. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 5 C.L. ac. of F.Y.M. (vi) Bajra - 207 (medium). (vii) Unirrigated. (viii) 4 interculturings and 1 weeding. (ix) 32.06. (x) 26.9.1956.

2. TREATMENTS:

Same as in expt. no. 55(56) above.

3. DESIGN:

(i) R.B.D. (ii) a 2. b, N.A. (iii) 12. (iv) a, 41’x20’. (v) 36’x15’. (v) 2.5’x2.5’. (vi) No.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Fodder and grain yield. (iv) (a) 1955—contd. (b) and (c) No. (v) (a) Amreli and Desha. (b) N.A. (vi) and (vii) Thz expt. was actually planned as paired-plot but analysed as R.B.D.

5. RESULT:

(i) 686 lb./ac. (ii) 128.5 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.
Crop: Bajra (Kharif).

Object: To find out a suitable method of cultivation for Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Sandy. Goradu. (b) Refer soil analysis, Talod. (iii) 17.7.1957. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Bajra—207. (vii) Unirrigated. (viii) 3 interculturings and 2 weedings. (ix) 14.99°. (x) 22.9.1957.

2. TREATMENTS:
   Same as in expt. no. 55(56) on page 218.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 41'X20'. (b) 36'X15'. (v) 2.5'X2.5'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1004 lb./ac. (ii) 218.6 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment  
   1  2
   Av. yield 1120 889
   S.E./mean = 63.1 lb./ac.

_________

Crop: Bajra (Kharif).

Object: To find out the optimum manurial and spacing requirements of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 17.7.1958. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) 2 weedings, 2 thinnings and 1 interculturing. (ix) N.A. (x) 15.10.1958.

2. TREATMENTS:
   Same as in expt. no. 58(116) on page 215.

3. DESIGN:
   (i) 3² confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (c) 24'X18'. (b) 18'X9'. (v) 3'X4.5'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 914 lb./ac. (ii) 174.4 lb./ac. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment  
   1  2
   Av. yield 954 418
   S.E./mean = 37.1 lb./ac.
Crop :- Bajra *(Kharij).*  
Ref :- Gj. 59(103).  
Type :- ‘CM’.

Object :- To find out the optimum manurial requirements of Bajra.

2. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Wheat.  (c) Nil.  (ii) (a) Medium black.  (b) Refer soil analysis, Umrala.  (iii) 7.7 1959.  (iv) a, 1 ploughing and 2 harrowings.  (b) Drilling.  (c) 5 lb./ac.  (d) As per treatments.  (e) N.A.  (v) Nil.  (vi) 28-15-2.  (vii) Unirrigated.  (viii) Nil.  (ix) 25.98 *.  (x) 22.10.1959.

2. TREATMENTS:
   Same as in expt. no. 58,116, on page 215.

3. DESIGN:
   (i) 3² confd.  (ii) 3 plots/block; 3 blocks/replication.  (b) N.A.  (iii) 2.  (iv) (a) 24’x18’.  (b) 18’x12’.  (v) 3’x3’.  (vi) Yes.

4. GENERAL:
   (i) Fair.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1958—contd.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 534 lb. ac.  (ii) 120.9 lb./ac.  (iii) Treatment differences are 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>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>C₁</td>
<td>492</td>
<td>562</td>
<td>460</td>
<td>505</td>
<td>508</td>
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<td>562</td>
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<td>504</td>
<td>591</td>
<td>506</td>
<td>534</td>
<td>475</td>
<td>553</td>
<td>573</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean =41.6 lb./ac.  
S.E. of body of any table =72.0 lb./ac.
Crop :- Bajra (Kharif).
Object :- To find out the optimum number of irrigations for Bajra.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 9.7.1954. (iv) (a) Harrowing. (b) Drilling. (c) 6 lb./ac. (d) 18". (e) N.A. (v) 10 lb./ac. of N top dressed on 1.8.1954. 10 lb./ac. of manure mixture drilled with seed on 9.7.1954. (vi) Bajra-28—15 (vii) Irrigated. (viii) 2 interculturings (ix) N.A. (x) 12.10.1954.

2. TREATMENTS :
3 levels of irrigation: \( I_0=0, I_1=1 \) and \( I_2=2 \) irrigations.

3. DESIGN :
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) \( 66' \times 24' \) . (b) \( 60' \times 18' \) . (v) \( 3' \) around. (vi) Yes...

4. GENERAL :
(i) Not satisfactory. (ii) Slight blister beetle attack. (iii) Grain yield. (iv) (a) 1954—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 329 lb./ac. (ii) 40.28 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

\[
\begin{array}{ccc}
\text{Treatment} & I_0 & I_1 & I_2 \\
\text{Av. yield} & 332 & 335 & 319 \\
\text{S.E./mean} & =18.00 \text{ lb./ac.} \\
\end{array}
\]

Crop :- Nagli (Kharif).
Site :- Agri. Res. Stn., Waghai.
Object :- To study the effect of \( \text{ZnSO}_4 \) on the yield of Nagli.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Light with reddish colour. (b) N.A. (iii) 26.6.1955. (iv) (a) N.A. (b) Transplanting. (c) →. (d) \( 1' \times 1' \). (e) →. (v) Nil. (vi) B—11. (vii) Unirrigated. (viii) 3 hand weedicings and 1 intercuituring. (ix) 5.11.1955.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 2 levels of Zinc Sulphate : \( Z_0=0 \) and \( Z_1=\text{ZnSO}_4 \) applied; quantity—N.A.
(2) 3 levels of manure : \( M_0=0, M_1=3 \text{ C.L./ac. of F.Y.M.} \) and \( M_2=3 \text{ C.L./ac. of F.Y.M.} +40 \text{ lb./ac.} \) of \( \text{N}+20 \text{ lb./ac. of P}_2\text{O}_5 \).
Sources of N and P are N.A.

3. DESIGN :
(i) R.B.D. Fact. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) \( 18' \times 30' \). (b) \( 12' \times 24' \). (v) \( 3' \) around. (vi) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Yield data. (iv) (a) 1955—1957 (b) 1st year of expt. (c) Nil. (v) (a) and (vi) and (vii) Nil.

5. RESULTS :
(i) 990 lb./ac. (ii) 167.5 lb./ac. (iii) M effect is highly significant. Interaction \( M \times Z \) is significant and \( Z \) effect is not significant. (iv) Av. yield of grain in lb./ac.
Crop: Nagli (Kharif).


Object: To study the effect of ZnSO₄ on the yield of Nagli.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Paddy. (c) Nil. (ii) (a) Light with reddish colour. (b) N.A. (iii) 27.6.1956, transplanting on 2, 3, 8.1956. (iv) (a) N.A. (b) Hand sowing, transplanting. (c) —. (d) 1’x1’. (e) 1. (vi) Nil. (v) Nagli—B-11. (vii) Unirrigated. (viii) 3 readings. (ix) 103.6°. (x) 16.11.1956.

2. TREATMENTS:

   Same as in exp. no. 55(68) on page 221.

3. DESIGN:
   (i) R.B.D. Fact. (ii) 6. (b) N.A. (iii) 6. (iv) 18’x33’. (b) 12’x24’. (v) 3’ around. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Yield data. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1359 lb./ac. (ii) 241.1 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z₀</td>
<td>1182</td>
<td>1169</td>
<td>1740</td>
<td>1364</td>
</tr>
<tr>
<td>Z₁</td>
<td>1147</td>
<td>1223</td>
<td>1696</td>
<td>1355</td>
</tr>
<tr>
<td>Mean</td>
<td>1165</td>
<td>1196</td>
<td>1718</td>
<td>1359</td>
</tr>
</tbody>
</table>

S.E. of M marginal mean = 69.6 lb./ac.
S.E. of Z marginal mean = 56.8 lb./ac.
S.E. of body of table = 98.4 lb./ac.

Crop: Nagli (Kharif).


Object: To study the effect of ZnSO₄ on the yield of Nagli.

Ref.: Gj. 56(82).
Type: ‘M’.

Ref.: Gj. 57(103).
Type: ‘M’.
1. BASAL CONDITIONS:
   (i) (a) No. (b) Paddy. (c) Nil. 
   (ii) (a) Light with reddish colour. (b) N.A. (iii) 23.6.1957 and 13.7.1957. 
   (iv) (a) 1 ploughing and 1 puddling. (b) Hand sowing, transplanting. 
   (c) —. (d) 1' × 1'. (e) 1. 
   (v) Nil. (vi) Nagli—B-11. (vii) Unirrigated. (viii) 1 interculturing and 1 weeding. (ix) 45.77°. 
   (x) 5.11.1957.

2. TREATMENTS:
   Same as in exp. no. 55(68) on page 221.

3. DESIGN:
   (i) R.B.D. Fact. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 18' × 30'. (b) 12' × 24'. (v) 3' × 3'. (vi) Yes.

4. GENERAL:
   (i) Due to lack of sufficient rains growth was not satisfactory. 
   (ii) Nil. (iii) Yield data. (iv) 1955—1957. (v) No. (c) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1032 lb./ac. (ii) 122.3 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z0</td>
<td>934</td>
<td>914</td>
<td>1204</td>
<td>1017</td>
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<td>Z1</td>
<td>980</td>
<td>933</td>
<td>1229</td>
<td>1047</td>
</tr>
<tr>
<td>Mean</td>
<td>957</td>
<td>924</td>
<td>1216</td>
<td>1032</td>
</tr>
</tbody>
</table>

S.E. of M marginal mean = 35.3 lb./ac. 
S.E. of Z marginal mean = 28.8 lb./ac. 
S.E. of body of table = 49.9 lb./ac.

Crop :- Nagli (Kharif).
Ref :- Gj. 56(22).
Site :- Agri. Res. Sta., Dohad.
Type :- ‘CM’.

Object :- To study the effect of two different methods of cultivation on the yield of Nagli.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Maize. (c) 150 seers/acre. of G.N.C. (ii) (a) Medium brown. (b) Refer soil analysis, Dohad. 
   (iii) 17.8.1955. (iv) (a) Preparatory tillage by local plough. (b) Transplanting. (c) —. (d) 12’ between rows 
   and 6’ between plants. (e) As per treatments. (v) As per treatments. (vi) Nagli (local). (vii) Unirrigated. (viii) 1 interculturing. (ix) 32.50°. (x) 24.11.1955.

2. TREATMENTS:
   2 methods of cultivation:
   40 lb./ac. applied in two doses and P₂O₅ at 20 lb./ac. applied in one dose. 
   (2) Local method: Seed rate—2 to 3 seedlings/bunch.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 18’ × 30’. (b) 12’ × 24’. (v) 3’ around the net plot. (vi) Yes.

4. GENERAL:
   (i) The germination and general growth of the crop was normal. No seasonal abnormalities were observed. 
   (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Hatkamba, Karjat, Vadgaon and 
   Waghai. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1074 lb./ac. (ii) 309.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of 
   grain in lb./ac.
Crop: Nagli (*Kharij*).


*Ref:* Gj. 58(13).

*Type:* 'CM'.

Object: To study the effect of two different methods of cultivation on the yield of Nagli.

### BASAL CONDITIONS

(i) (a) No. (b) Maize and gram. (c) N.A. (ii) (a) Light brown. *Gora*.

*Note:* Refer soil analysis.

*Dohad.* (iii) N.A. (iv) 2 ploughings. (b) Transplantings. (c) (d) 12" x 6". (e) N.A. (v) Nil.

(vi) Local. (vii) Unirrigated. (viii) 2 weedings and 2 interculturings. (ix) 46.62". (x) N.A.

### TREATMENTS:

1. **Departmental method:**
   - 40 lb./ac. of N as *A.S* in two doses: one at sowing and the other one month after transplanting.
   - 20 lb./ac. of *P₂O₅* as *Super* 15 days after transplanting.

2. **Local method:** No manure. Cultural treatment N.A.

### DESIGN:

1. R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 30' x 22'. (b) 28' x 20'. (v) 1' around. (vi) Yes.

### GENERAL:

1. N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

### RESULTS:

1. $812$ lb./ac. (ii) $110.1$ lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1269</td>
<td>880</td>
</tr>
<tr>
<td>S.E. mean</td>
<td>=89.3 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

Crop: Nagli (*Kharij*).


*Ref:* Gj. 59(5).

*Type:* 'CM'.

Object: To study the effect of two different methods of cultivation on the yield of Nagli.

### BASAL CONDITIONS

1. (a) No. (b) Wheat. (c) N.A. (ii) (a) Medium black (Rocky type). (b) Refer soil analysis, Dohad.

*Note:* 20.8.1959. (iv) (a) One ploughing and one harrowing. (b) Transplanting. (c) (d) 12" x 6". (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) 2 weedings and 2 interculturings. (ix) 36.62". (x) 21.11.1959.

### TREATMENTS:

1. **Departmental method:**
   - 40 lb./ac. of N as *A.S* in two doses: one at sowing and the other one month after transplanting.
   - 20 lb./ac. of *P₂O₅* as *Super* 15 days after transplanting.

2. **Local method:** No manure.

### DESIGN:

1. R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 18" x 33'. (b) 12' x 24'. (v) 3' x 4.5'. (vi) Yes.

### GENERAL:

1. N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 680 lb./ac. (ii) 99.92 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

Treatment 1 2
Av. yield 813 548
S.E./mean = 28.85 lb./ac.

Crop: Nagli (Kharif).

Ref: Gj. 55(66).
Type: ‘CM’.

Object: To study the effect of two different methods of cultivation on the yield of Nagli.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Paddy. (c) G.M. (ii) (a) Light with reddish colour. (b) N.A. (iii) 26.6.1955/30.7.1955.

2. TREATMENTS:
2 methods of cultivation
(1) Departmental method: Basal dose—3 C.L.fac. of F.Y.M. 40 lb./ac. of N applied in two doses and 20 lb./ac. of P2O5 applied in single dose.
(2) Local method: No manure.
Details of cultural treatment N.A.

3. DESIGN:
(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 36'×18'. (b) 34'×16'. (v) 1' around. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Mild attack of Piricularia. (iii) Grain yield. (iv) (a) 1955-1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1187 lb./ac. (ii) 144.8 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

Treatment 1 2
Av. yield 963 1412
S.E./mean = 41.8 lb./ac.

Crop: Nagli (Kharif).

Ref: Gj. 56(80).
Type: ‘CM’.

Object: To study the effect of two different methods of cultivation on the yield of Nagli.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Light with reddish colour. (b) N.A. (iii) 30.6.1956/3 and 4.8.1956. (iv) (a) N.A. (b) Transplanting. (c) As per treatments. (d) As per treatments. (e) 1. (v) Nil. (vi) Nagli (local). (vii) Unirrigated. (viii) 2 weeding. (ix) 108.69°. (x) 9.11.1956.

2. TREATMENTS:
2 methods of cultivation
(1) Departmental method: Basal dose—3 C.L.ac. of F.Y.M.; 40 lb./ac. of N in two equal doses and 20 lb./ac. of P2O5 as Super in one dose. Seed rate 4 lb./ac. and spacing 12'×6'.
(2) Local method: No manure. Details of cultural treatment N.A.

3. DESIGN:
(i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 12. (iv) (a) 36'×18'. (b) 34'×16'. (v) 1' around. (vi) Yes.
4. GENERAL
(i) Crop growth good. (ii) Nil. (iii) Grain yield (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1287 lb./ac. (ii) 160.7 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1554</td>
<td>1020</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>46.4 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Nagli (Kharif).
Site :- Agri. Res. Stn., Waghai.
Object :- To study the effect of two different methods of cultivation on the yield of Nagli.

1. BASAL CONDITIONS:
(i) Nil. (b) Paddy. (c) 5 C.L./ac. of F.Y.M.-+ G.M.-+ 100 lb./ac. of N+80 lb./ac. of P$_2$O$_5$. (ii) (a) Light and reddish colour. b) N.A. (iii) 23.6.1957/13, 15.7.1957. (iv) (a) 2 ploughings and 1 puddling. (b) Hand sowing. (c) and (d) As per treatments. (e) 1. (v) Nil. (vi) Nagli B—11. (vii) Unirrigated. (viii) 1 interculturing and 1 weeding. (ix) 78.77°. (x) 6.11.1957.

2. TREATMENTS:
Two methods of cultivation:
(1) Local method - No particular spacing.
(2) Departmental method: 3 C.L./ac. of F.Y.M.-+40 lb./ac. of N in two doses as A.S.+20 lb./ac. of P$_2$O$_5$ in single dose as Super, seed rate 4 lb./ac., spacing 12"×6".

3. DESIGN:
(i) R.B.D. (ii) (a) 2. (b) 36′ × 36′. (iii) 12. (iv) (a) 36′ × 18′. (b) 34′ × 16′. (v) 1′ around. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain and fodder yield, tillers, plant height flowering date and no. of grains per earhead. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1114 lb./ac. (ii) 106.3 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th>Treatment</th>
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<tr>
<td>Av. yield</td>
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<td>1211</td>
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<tr>
<td>S.E./mean</td>
<td>30.7 lb./ac.</td>
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Crop :- Nagli (Kharif).
Site :- Agri. Res. Stn., Waghai.
Object :- To study the effect of two different methods of cultivation on the yield of Nagli.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Paddy. (c) Nil. (d) (i) (a) Light with reddish colour. (b) N.A. (iii) 23.6.1958/20, 21.7.1958. (iv) (a) 2 ploughings and 1 puddling. (b) Hand sowing. (c) and (d) As per treatments. (e) 1. (f) Nil. (g) Nagli B—11. (h) Unirrigated. (i) 1 interculturing and 1 weeding. (ix) 93.65° (55.27° in July, Aug. and Sept). (x) 13.11.1958.

2. TREATMENTS:
Two methods of cultivation:
(1) Local method—Without any particular spacing.
(2) Departmental method: 3 C.L./ac. of F.Y.M.-+40 lb./ac. N in two doses as A.S.+20 lb./ac. of P$_2$O$_5$ as Super in a single dose, spacing 12"×6", seed rate 4 lb./ac.
3. DESIGN:

(i) R.B.D. (ii) 2. (b) N.A. (iii) 12. (iv) (a) 36'×18'. (b) 34'×16'. (v) 1' alround. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain yield, height of plant and no. of tillers. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 706 lb./ac. (ii) 77.25 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th>Treatment</th>
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<tr>
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<tr>
<td>S.E./mean</td>
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**Crop :- Nagli (Kharif).**

**Site :- Agri. Res. Stn., Waghai.**

**Ref :- Gj. 55(67).**

**Type :- ‘CM’.**

Object :-To find out proper spacing and economic dose of manure for Nagli.

1. BASAL CONDITIONS:

(i) (a) Paddy-Nagfi. (b) Paddy. (c) Nil. (ii) (a) Light with reddish colour. (b) N.A. (iii) 26.6.1955, transplanting on 5.8.1955. (iv) (a) N.A. (b) Transplanting. (c) —. (d) As per treatments. (e) I. (v) Nil. (vi) Nagli B-11. (vii) Unirrigated. (viii) 3 weedings. (ix) 85°. (x) 22.11.1955.

2. TREATMENTS:

**Main-plot treatments :**

All combinations of (1) and (2)

(1) 4 spacings: S1=6"×6", S2=9"×6", S3=12"×6" and S4=15"×6".

(2) 2 manures: M1=G.M. and M2=3 C.L. of F.Y.M.

**Sub-plot treatments :**

6 doses of fertilizers: F0=0, F1=20, F2=40 and F3=60 lb./ac. of N as A/S ; F4=40 lb./ac. of P2O5 and F5=60 lb./ac. of N+20 lb./ac. of P2O5 as Super.

3. DESIGN:

(i) Split-plot. (ii) (a) 8 main-plots/replication and 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 15'×26'. (b) 10'×20' and for S1, S2 and S3 and 9'×22' for S2. (v) 2.5'×3' for S1, S3 and S4 and 3'×2' for S2. (vi) Yes.

4. GENERAL:

(i) Growth satisfactory. (ii) Attack of Piricularia on seedlings was observed. (iii) Grain yield. (iv) (a) 1955—1958. (b) This is the first year of the expt. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1063 lb./ac. (ii) (a) 290.4 lb./ac. (b) 206.8 lb./ac. (iii) F effect is highly significant. Interactions S×F, S×M and S×M×F are significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th>S1</th>
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<th>S3</th>
<th>S4</th>
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</table>
S.E. of difference of two

1. S marginal means = 59.3 lb./ac.  5. S means at the same level of F = 111.4 lb./ac.
2. M marginal means = 41.9 lb./ac.  6. F means at the same level of M = 73.1 lb./ac.
3. F marginal means = 51.7 lb./ac.  7. M means at the same level of F = 78.8 lb./ac.
4. F means at the same level of S = 103.4 lb./ac.  S.E. of body of $S \times M$ table = 59.3 lb./ac.

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Crop :- Nagli ('Kharif').
Site :- Agri. Res. Stn., Waghai.

Ref :- Gji. 56(81).
Type :- 'CM'.

Object :- To find out proper spacing and economic dose of manure for Nagli.

1. BASAL CONDITIONS :
   (i) 'a' Paddy—Nagli.  (b) Paddy.  (c) Nil.  (ii) (a) Light with reddish colour.  (b) N.A.- (iii) 30.6.1956. Transplanting on 4 and 5.8.1956.  (iv) (a) N.A.  (b) Transplanting.  (c) -.  (d) As per treatments.  'c' one.  (v) Nil.  (vi) Nagli B—11.  (vii) Unirrigated.  (viii) 2 weedings.  (ix) N.A.  (x) 17, 18 and 19.11.1956.

2. TREATMENTS :
   Same as in expt. no 55(67) on page 227.

3. DESIGN :
   (i) Split-plot.  (ii) (a) 8 main-plots/replication and 6 sub-plots/main-plot.  (b) N.A.- (iii) 2.  (iv) (a) 15'-x-26'.  (b) 10'-x-20', for $S_1$, $S_2$ and $S_4$ and 9'-x-22' for $S_2$.  (v) 2.5'-x-3 for $S_1$, $S_2$ and $S_4$ and 3'-x-2' for $S_2$.  (vi) Yes.

4. GENERAL :
   (i) Good.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1955-1958.  (b) No.  (c) Nil.  (v) 'a' and (b) N.A.- (vi) and (vii) Nil.

5. RESULTS :
   (i) 1251 lb./ac.  (ii) (a) 296.5 lb./ac.  (b) 196.0 lb./ac.  (iii) Only F and S effects are significant.  (iv) Av. yield of grain in lb./ac.

<table>
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<th>$S_1$</th>
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<th>$S_3$</th>
<th>$S_4$</th>
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<td>1087</td>
<td>1251</td>
<td>1231</td>
<td>1271</td>
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</tbody>
</table>

S.E. of difference of two

1. S marginal means = 85.6 lb./ac.  5. S means at the same level of F = 152.7 lb./ac.
2. M marginal means = 60.5 lb./ac.  6. F means at the same level of M = 98.0 lb./ac.
3. F marginal means = 69.3 lb./ac.  7. M means at the same level of F = 108.0 lb./ac.
4. F means at the same level of S = 138.6 lb./ac.  S.E. of body of $S \times M$ table = 85.6 lb./ac.

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Crop :- Nagli ('Kharif').
Site :- Agri. Res. Stn., Waghai.

Ref :- Gji. 57(102).
Type :- 'CM'.

Object :- To find out proper spacing and economic dose of manure for Nagli.
1. **BASAL CONDITIONS**:
   (i) (a) Paddy—Nagli. (b) Paddy. (c) Nil. (ii) (a) Light with reddish colour. (b) N.A. (iii) 23.6.1957. 20 and 21.7.1957 (iv) (a) 2 ploughings and 2 puddings. (b) Hand sowing. (c) N.A. (d) As per treatments. (e) 1. (v) Nil. (vi) Nagli B—11. (vii) Unirrigated. (viii) 9.7.1957. 3 and 9.11.1957.

2. **TREATMENTS**:
   Same as in exp. no. 55(67) on page 227.

3. **DESIGN**:
   (i) Split-plot. (ii) (a) 6 sub-plots/main-plot and 8 main-plots/replication. (b) 104' x 180'. (iii) 2. (iv) (a) 15' x 26'. (b) 10' x 20' for S1, S2 and S4 and 9' x 22' for S2. (v) 2.5' x 3' for S1, S3 and S4 and 3' x 2' for S2. (vi) Yes.

4. **GENERAL**:
   (i) Satisfactory growth. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   (i) 1142 lb./ac. (ii) (a) 277.8 lb./ac. (b) 221.6 lb./ac. (iii) Only F effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
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</table>

S.E. of difference of two
1. S marginal means = 80.2 lb./ac. 5. F means at the same level of M = 110.8 lb./ac.
2. M marginal means = 56.6 lb./ac. 6. S means at the same level of F = 163.9 lb./ac.
3. F marginal means = 78.3 lb./ac. 7. M means at the same level of F = 115.9 lb./ac.
4. F means at the same level of S = 156.7 lb./ac. S.E. of body of S x M table = 80.2 lb./ac.

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**Crop:** Nagli (Kharif).

**Site:** Agri. Res. Stn., Waghai.

Ref:- Gj. 58(68).

Type :- 'CM'.

Object :- To find out proper spacing and economic dose of manure for Nagli.

1. **BASAL CONDITIONS**:
   (i) (a) Paddy—Nagli. (b) Paddy. (c) Nil. (ii) (a) Light with reddish colour. (b) N.A. (iii) 23.6.1958. Transplanting on 26, 27.7.1958. (iv) (a) 1 ploughing and 1 puddling. (b) Hand sowing. (c) N.A. (d) As per treatments. (e) 1. (v) Nil. (vi) B—11. (vii) Unirrigated. (viii) 2 weedings. (ix) 92.97° (x) 8 and 9.11.1958.
2. TREATMENTS:
Same as in expt. no. 55(67) on page 227.

3. DESIGN:
(i) Split-plot. (ii) 6 sub-plots/main-plot and 8 main-plots/replication. (b) N.A. (iii) 2. (iv) (a) 15′×26′. (b) 10′×20′ for S1, S3 and S4 and 9′×22′ for S2. (v) 2.5′×3′ for S1, S3 and S4 and 3′×2′ for S2. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) [a] and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1428 lb./ac. (ii) (a) 249.4 lb./ac. (b) 245.2 lb./ac. (iii) Only F effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
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<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
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Mean 1523 1343 1492 1354 1428 1492 1364

M1 1583 1451 1604 1329

M2 1462 1236 1380 1380

S.E. of difference of two
1. S marginal means = 72.0 lb./ac. 5. F means at the same level of M = 122.6 lb./ac.
2. M marginal means = 50.9 lb./ac. 6. S means at the same level of F = 173.9 lb./ac.
3. F marginal means = 86.7 lb./ac. 7. M means at the same level of F = 122.9 lb./ac.
4. F means at the same level of S = 113.4 lb./ac.

S.E. of body of S×M table = 72.0 lb./ac.

---

Crop :- Banti (hill millet) (Kharif).
Site :- Agri. Res. Stn., Harij.

Object :- To determine the sulphur requirement for Banti crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) Salty soil. (b) Refer soil analysis, Harij. (iii) 24.7.1954. (iv) (a) 2 ploughings and 1 harrowing. (b) to (e) N.A. (v) Nil. (vi) Hill millet. (vii) Unirrigated. (viii) Nil. (ix) 18′. (x) 17.10.1954.

2. TREATMENTS:
3 levels of sulphur : S0=0, S1=½ and S2=½ ton/ac.
Sulphur applied on 22.7.1954.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 53′×16′. (v) Nil. (vi) Yes.

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

5. RESULTS:
(i) 283.3 lb./ac. (ii) 93.72 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.
Crop: Banti (hill millet) (Kharif).
Object: To determine the gypsum requirement for Banti crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Salty soil. (b) Refer soil analysis, Harij. (iii) 24.7.1954. (iv) (a) 2 ploughings and 1 harrowing. (b) to (e) N.A. (v) Nil. (vi) Hill millet. (vii) Unirrigated. (viii) N.A.
   (ix) 18". (x) 17.10.1954.

2. TREATMENTS:
   3 levels of gypsum: \( G_0 = 0 \), \( G_1 = \frac{1}{2} \) and \( G_2 = 1 \) ton/ac.
   Gypsum applied on 22.7.1954.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 33' X 16'. (v) Nil. (vi) Yes.

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

5. RESULTS:
   (i) 366.6 lb./ac. (ii) 57.84 lb./ac. (iii) Treatments differ significantly. (iv) Av. yield of grain in lb./ac.
   Treatment
   \[ \begin{array}{ccc}
   \text{Treatment} & S_1 & S_2 \\
   \text{Av. yield} & 275 & 255 & 320 \\
   \text{S.E./mean} & \approx 46.86 \text{ lb./ac.} \\
   \end{array} \]

Crop: Banti (Kharif).
Object: To study the residual effect of gypsum and F.Y.M. on Banti crop.

1. BASAL CONDITIONS:
   (i) (a) Banti—Banti. (b) Banti. (c) As per treatments. (ii) (a) Salty soil. (b) Refer soil analysis, Harij. (iii) 16.8.1958. (iv) (a) 1 harrowing and 1 ploughing. (b) Drilling. (c) 10 lb./ac. (d) 12" X 1". (e) N.A. (v) Nil. (vi) Hill millet. (vii) Unirrigated. (viii) 1 weeding and 1 interculturing. (ix) 14". (x) 24.10.58.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 5 levels of gypsum: \( G_0 = 0 \), \( G_1 = \frac{1}{2} \), \( G_2 = 1 \), \( G_3 = 1\frac{1}{2} \) and \( G_4 = 2 \) ton/ac.
   (2) 2 levels of F.Y.M.: \( M_0 = 0 \) and \( M_1 = 10 \) C.L./ac.
   Manures applied to the previous Banti crop.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 21' X 36'. (b) 15' X 30'. (v) 3' around. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 696.5 lb./ac. (ii) 121.5 lb./ac. (iii) Interaction G×M alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>G_3</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>M_0</td>
<td>585</td>
<td>720</td>
<td>689</td>
<td>711</td>
<td>730</td>
</tr>
<tr>
<td>M_1</td>
<td>842</td>
<td>650</td>
<td>578</td>
<td>723</td>
<td>738</td>
</tr>
<tr>
<td>Mean</td>
<td>714</td>
<td>685</td>
<td>633</td>
<td>717</td>
<td>734</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of G = 42.9 lb./ac.
S.E. of marginal mean of M = 27.2 lb./ac.
S.E. of body of table = 60.7 lb./ac.

Crop : Chinamug (Kharif).
Ref : Gj. 54(21).
Type : 'M'.

Object :—To study the effect of leguminous crop grown with and without Super on the succeeding Jowar.

1. BASAL CONDITIONS:

2. TREATMENTS:
   1. No P_2O_5.
   2. 50 lb./ac. of P_2O_5 as Super.
   3. 100 lb./ac. of P_2O_5 as Super.
   4. 150 lb./ac. of P_2O_5 as Super.
   5. Fallow in kharif and sown in Rabi; manured with 10 C.L./ac. of F.Y.M.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 48'×30'. (b) 36'×18'. (v) 6' round the net plot. (vi) Yes.

4. GENERAL:
   (i) Poor due to heavy rains in August 1954. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1948 (kharif)—1954 (rabi). (b) and (c) No. (v) (a) Mohol. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 85 lb./ac. (ii) 49.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>71</td>
<td>80</td>
<td>96</td>
<td>93</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 22.2 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. **BASAL CONDITIONS:**

   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 16.7.1956. (iv) (a) Nil. (b) Drilling. (c) 12 lb./ac. (d) 18° between rows. (e) N.A. (v) Nil. (vi) Mur-Marathawada. (vii) Unirrigated. (viii) One weeding. (ix) N.A. (x) 22.9.1956.

2. **TREATMENTS:**

   1. Control (no P2O5).
   2. 16 lb./ac. of P2O5 every year.
   3. 16 lb./ac. of P2O5 alternate year.
   4. 32 lb./ac. of P2O5 every year.
   5. 32 lb./ac. of P2O5 alternate year.

3. **DESIGN:**

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 40'×16.25'. (b) 34'×9'. (v) 3'×3'. (vi) Yes.

4. **GENERAL:**

   (i) Normal. (ii) Attack of surface grass-hoppers. (iii) Grain yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**

   (i) 318 lb./ac. (ii) 43.56 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2+3</th>
<th>4+5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>249</td>
<td>302</td>
<td>369</td>
</tr>
</tbody>
</table>

   S.E. of control vs other treatment means = 26.68 lb./ac.

---

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

**Site :- Agri. Res. Stn., Halvad.**

Ref :- Gj. 57(126).

Type :- 'M'.

Object :- To study the direct effect of P2O5 applied to Mug and its residual effect on succeeding Wheat.

1. **BASAL CONDITIONS:**

   (i) (a) Mug—Wheat. (b) Fallow. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 4.7.1957. (iv) (a) Nil. (b) Drilling. (c) 12 lb./ac. (d) 18°×3' to 4'. (e) —. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) One weeding. (ix) 15.09°. (x) 12.9.1957.

2. **TREATMENTS:**

   Same as in exp. no. 56(127) on page 232.

3. **DESIGN:**

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 51'×18'. (b) 45'×12'. (v) 3'×3'. (vi) Yes.

4. **GENERAL:**

   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (v') and (vii) N.A.

5. **RESULTS:**

   (i) 321 lb./ac. (ii) 70.82 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>341</td>
<td>267</td>
<td>345</td>
<td>342</td>
<td>310</td>
</tr>
</tbody>
</table>

   S.E./mean = 35.41 lb./ac.

---

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

**Site :- Agri. Res. Stn., Halvad.**

Ref :- Gj. 58(20).

Type :- 'M'.

Object :- To study the direct effect of P2O5 on Mug and its residual effect on succeeding Wheat.
1. BASAL CONDITIONS:
   (i) (a) Legum.—Cereal.—Cotton. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 16.7.1958. iv, a, 2 ploughings; 2 harrowings. (b) Drilling. (c) 8 lb./ac. (d) 18" between rows. (v) Nil. (vi) MG—Marathawada. (vii) Irrigated. (viii) 2 interculturings. (x) 13°. (x) 24.9.1958.

2. TREATMENTS:
   Same as in exp. no. 56(127), on page 232.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) 51' × 18'. (b) 45' × 12'. (v) 3' × 3'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 365.6 lb./ac. (ii) 34.07 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of grain in lb./ac.
   Treatment 1 2 3 4 5
   Av. yield 359 347 342 395 385
   S.E./mean = 17.03 lb./ac.

---

Crop :- Chinamug (Kharif).
Object :- To study the direct effect of P₂O₅ on Mug and its residual effect on succeeding Wheat.

---

1. BASAL CONDITIONS:
   (i; (a) Mag—Wheat. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 6.7.1959. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 25 lb./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) Mag—Marathawada—(early). (vii) Unirrigated. (viii) 1 weeding and 3 interculturings. (ix) 34°. (x) 25 and 26.9.1959.

2. TREATMENTS:
   Same as in exp. no. 56(127); on page 232.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 51' × 18'. (b) 45' × 12'. (v) 3' × 3'. (vi) Yes.

4. GENERAL:
   (i) Excellent germination. Crop damaged by rain. (ii) Slight attack of grass-hoppers, aphids and pod borers. (iii) Pod yield. (iv) (a) 1957—N.A. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   164 lb./ac. (ii) 40.33 lb./ac. (iii) Treatments differ significantly. (iv) Av. yield of pod in lb./ac.
   Treatment 1 2 3 4 5
   Av. yield 129 146 158 232 157
   S.E./mean = 20.16 lb./ac.

---

Crop :- Gram.
Object :- To study the N, P and K requirements of Gram.

---

Ref :- Gj. 59(10).
Type :- 'M'.

Ref :- Gj. 54(4).
Type :- 'M'.

---
1. **BASAL CONDITIONS**:

2. **TREATMENTS**:
   1. Control.
   2. 20 lb./ac. of N as A/Sand G.N.C. (1 : 1).
   3. 20 lb./ac. of P₂O₅ as Super.
   4. 40 lb./ac. of K₂O as K₂SO₄.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 90'×6'. (b) 81.5'×4'. (v) 4'×1'. (vi) Yes.

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

5. **RESULTS**:
   (i) 356.3 lb./ac. (ii) 74.63 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>360.3</td>
<td>347.0</td>
<td>382.6</td>
<td>335.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 30.46 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Crop** :- Gram.  
**Site** :- Agri. Res. Stn., Arnej.  
Object :- To study the N, P and K requirements of Gram.

---

**Crop** :- Gram (Rabi).  
**Site** :- Agri. Res. Stn., Arnej.  
Object :- To study the N, P and K requirements of Gram.
1. BASAL CONDITIONS:
   (i) Wheat—Gram. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Arnej. (iii) 27.10.1956. (iv) (a) 5 harrowings. (b) to (c) N.A. (v) 5 C.L./ac. of F.Y.M. broadcast in September (vi, Chafa (medium)). (vii) Unirrigated. (viii) 1 weeding. (ix) 39°. (x) 18.2.1957.

2. TREATMENTS:
   Same as in expt. no. 54(4) on page 234.

3. DESIGN:
   (i, R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) 45'×12'. (b) 40'×10'. (v) 2.5'×1'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Nil. (iv) (a) 1951—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Due to heavy rains no adequate tillage operations were done and hence low yield. (vii) Nil.

5. RESULTS:
   (i) 441.4 lb./ac. (ii) 67.99 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>500.9</td>
<td>432.2</td>
<td>412.6</td>
<td>419.8</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=27.76 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop:** Gram *(Rabi).*

**Site:** Agri. Res. Stn., Arnej.

**Object:** To study the effects of N and P on Gram.

1. BASAL CONDITIONS:
   (i) A N.A. b) Gram. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Arnej. (iii) 8.11.1959. (iv) (a) 4 harrowings. (b) Drilling. (c) 20 lb./ac. (d) 12" between rows. (e) N.A. (v) Nil. (vi) Chafa. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 11.3.1960.

2. TREATMENTS:
   1. Control
   2. 5 lb. ac. of N as A/S.
   3. 20 lb. ac. of P₂O₅ as Super.
   4. 5 lb./ac. of N + 20 lb./ac. of P₂O₅.

3. DESIGN:
   (i) R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) 36'×27'. (b) 30'×21'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Yield was poor due to late sowing. (vii) Nil.

5. RESULTS:
   (i) 288 lb./ac. (ii) 91.89 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>255</td>
<td>316</td>
<td>247</td>
<td>335</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=37.52 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop:** Gram *(Rabi).*

**Site:** Agri. Res. Stn., Umrala.

**Ref:** Gj. 55(97).

**Object:** To study the effect of N and P on Gram.
1. **BASAL CONDITIONS**:
   
   (i) (a) Nil (b) Bajra. (c) 200 lb./ac. of manure mixture. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 12.11.1955. (iv) (a) 1 ploughing, 2 harrowings. (b) Drilling. (c) N.A. (d) 18" between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 4.3.1956.

2. **TREATMENTS**:
   
   All combinations of (1) and (2)
   
   (1) 3 levels of P_2O_5 as Super: P_0 = 0, P_1 = 18 and P_2 = 36 lb./ac. of P_2O_5.
   
   (2) 2 levels of N as A/S: N_0 = 0 and N_1 = 20 lb/ac. of N.

   P_2O_5 as Single Super applied at sowing and N as A/S on 26.12.1955.

3. **DESIGN**:
   
   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 16.5'×33'. (b) 13.5'×27'. (v) 1.5'×3'. (vi) Yes.

4. **GENERAL**:
   
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   
   (i) 748 lb./ac. (ii) 48.10 lb./ac. (iii) Main effects of P and N are highly significant. Interaction N×P is not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P_0</th>
<th>P_1</th>
<th>P_2</th>
<th>Mean</th>
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<tbody>
<tr>
<td>N_0</td>
<td>441</td>
<td>548</td>
<td>635</td>
<td>541</td>
</tr>
<tr>
<td>N_1</td>
<td>508</td>
<td>688</td>
<td>669</td>
<td>622</td>
</tr>
<tr>
<td>Mean</td>
<td>474</td>
<td>618</td>
<td>652</td>
<td>581</td>
</tr>
</tbody>
</table>

S.E. of P marginal mean = 17.01 lb./ac.
S.E. of N marginal mean = 13.89 lb./ac.
S.E. of body of table = 24.05 lb./ac.

---

**Crop:** Gram (*Rabi*).  
**Site:** Agri. Res. Stn., Umrala.  
**Ref:** Gj. 56(108).  
**Type:** 'M'.

Object—To study the effect of N and P on Gram.
<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>606</td>
<td>739</td>
<td>760</td>
<td>702</td>
</tr>
<tr>
<td>N₁</td>
<td>693</td>
<td>785</td>
<td>905</td>
<td>794</td>
</tr>
<tr>
<td>Mean</td>
<td>649</td>
<td>762</td>
<td>832</td>
<td>748</td>
</tr>
</tbody>
</table>

- S.E. of P marginal mean = 26.75 lb./ac.
- S.E. of N marginal mean = 21.84 lb./ac.
- S.E. of body of table = 37.82 lb./ac.

**Crop:** Gram (Rabi).

**Site:** Agri. Res. Stn., Umrala.

**Object:** To study the effect of N and P on Gram.

1. **BASAL CONDITIONS:**
   - (i) 'a' Nil. (b) Jowar. (c) N.A. (ii) (a) Medium black. (b) Refer soil analyses, Umrala. (iii) 13.11.1957.
   - (iv) a 1 ploughing and 2 harrowings. (b) to (e) N.A. (vi) Chafa, medium. (vii) Irrigated. (viii) N.A. (ix) Nil. (x) 27.2.1958.

2. **TREATMENTS:** and 3. **DESIGN:**
   - Same as in expt. no. 55(97) on page 236.

4. **GENERAL:**
   - (i) Good. (ii) Nil. (iii) No. of pods, no. of branches and grain yield. (iv) a, 1955—1957. (b) No. (c) Nil.
   - (v) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
   - (i) 393 lb./ac. (ii) 57.54 lb./ac. (iii) Main effect of N is highly significant. Main effect of P and interaction N × P are 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>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>295</td>
<td>319</td>
<td>343</td>
<td>319</td>
</tr>
<tr>
<td>N₁</td>
<td>485</td>
<td>406</td>
<td>511</td>
<td>467</td>
</tr>
<tr>
<td>Mean</td>
<td>390</td>
<td>363</td>
<td>427</td>
<td>393</td>
</tr>
</tbody>
</table>

- S.E. of P marginal mean = 20.34 lb./ac.
- S.E. of N marginal mean = 16.61 lb./ac.
- S.E. of body of table = 28.77 lb./ac.

---

**Crop:** Gram (Rabi).

**Site:** Agri. Res. Stn., Vijapur.

**Object:** To study the effects of different micro-nutrients on the yield of Gram.

1. **BASAL CONDITIONS:**
   - (i) 'a' Nil. (b) Wheat in Rabi—Jowar in Kharif. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 20.11.1955.
   - (iv) 'a' N.A. (b) Dibbling. (c) 30 lb./ac. (d) and (e) N.A. (v) 10 lb./ac. of N as A/S on 20.11.1956; 50 lb./ac. of P₂O₅ as Super on 19.11.1956. (vi) Local. (vii) Irrigated. (viii) Micro-nutrients were sprayed on 12.1.1956. (ix) Nil. (x) 11.3.1956.

---

**Crop:** Gram (Rabi).

**Site:** Agri. Res. Stn., Umrala.

**Ref:** Gj. 57(81).

**Type:** 'M'.

**Crop:** Gram (Rabi).

**Site:** Agri. Res. Stn., Umrala.

**Ref:** Gj. 55(59).

**Type:** 'M'.
2. TREATMENTS:

All combinations of (1), (2), (3), (4) and (5)

- 1. 2 levels of Zinc (Zn) as ZnSO₄: A₀ = ZnSO₄ and A₁ = ZnSO₄ at 9 lb. + Lime at 2 lb. + 100 gallons of water.
- 2. 2 levels of Manganese (Mn) as MnSO₄: B₀ = MnSO₄ and B₁ = MnSO₄ at 3 lb. + Lime at 2 lb. + 100 gallons of water.
- 3. 2 levels of Copper (Cu) as CuSO₄: C₀ = CuSO₄ and C₁ = CuSO₄ at 8 lb. + Lime at 8 lb. + 100 gallons of water.
- 4. 2 levels of Molybdenum (Mo) as Sodium Molybdate + CaCO₃: D₀ = Sodium Molybdate and D₁ = Sodium Molybdate at 3 oz. + 100 gallons of water.
- 5. 2 levels of Boron (B) as Borax: E₀ = Borax and E₁ = Borax at 2 lb. + Bentonite at 0.5 lb. + 100 gallons of water.

Total quantity of foliar spray is 100 gallons/ac. All sprays contain 3½ pints of Tenac (Burmah-Shell) per 100 gallons as spreader and sticker.

3. DESIGN:

(i) 25 facts in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 20' x 12'. (b) 16' x 8'. (v) 2' x 2'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Grain and fodder yield. Av. height of plant in each plot. (iv) (a) 1955–1958. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 2025 lb./ac. (ii) 481.5 lb./ac. (iii) Main effect of Cu and interactions Zn x Mn and Zn x Mo are significant. Other effects are not significant. (iv) Mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-6.9</td>
<td>-18.6</td>
<td>-233.7</td>
<td>147.0</td>
<td>-56.7</td>
</tr>
<tr>
<td></td>
<td>-251.0</td>
<td>-156.3</td>
<td>-320.7</td>
<td>32.1</td>
<td>-52.1</td>
</tr>
<tr>
<td>-</td>
<td>-239.3</td>
<td>-213.7</td>
<td>-212.3</td>
<td>-165.5</td>
<td>-52.7</td>
</tr>
<tr>
<td>+</td>
<td>225.4</td>
<td>213.7</td>
<td>81.7</td>
<td>-60.6</td>
<td>-60.6</td>
</tr>
<tr>
<td>-</td>
<td>70.5</td>
<td>-145.4</td>
<td>118.1</td>
<td>23.3</td>
<td>33.1</td>
</tr>
<tr>
<td>+</td>
<td>-84.3</td>
<td>108.1</td>
<td>174.7</td>
<td>-13.6</td>
<td>-146.4</td>
</tr>
<tr>
<td>S.E. of mean response</td>
<td>85.1 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E. of differential response</td>
<td>120.4 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Gram (Rabi).


Ref: Gj. 56(70).

Type: 'M'.

Object: To study the effects of different micro-nutrients on the yield of Gram.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Bajra. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 20.11.1956. (iv) (a) N.A. (b) Broadcasting. (c) 30 lb./ac. (d) 12' between rows. (e) N.A. (v) 50 lb./ac. of P₂O₅ as Super and 10 lb./ac. of N as A/S. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) Nil. (x) 5.4.1957.

2. TREATMENTS:

Same as in expt. no. 55(59) on page 238.

3. DESIGN:

(i) 25 facts in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 16' x 14'. (b) 12' x 10'. (v) 2' x 2'. (vi) Y₂.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1955–1958. (f) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.
5. RESULTS:
(i) 848 lb./ac. (ii) 403.3 lb./ac. (iii) None of the effects is significant. (iv) Mean and differential responses in lb./ac.

### Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zn 78.5</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Mn 64.5</td>
<td>11.4</td>
<td>57.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cu -33.8</td>
<td>56.5</td>
<td>-124.2</td>
<td>16.8</td>
<td>-54.5</td>
<td>-</td>
</tr>
<tr>
<td>Mo -71.8</td>
<td>-1.6</td>
<td>-142.1</td>
<td>-52.6</td>
<td>-91.1</td>
<td>-</td>
</tr>
<tr>
<td>B 13.1</td>
<td>15.9</td>
<td>10.3</td>
<td>118.9</td>
<td>-92.7</td>
<td>1.7</td>
</tr>
</tbody>
</table>

S.E. of mean response = 70.86 lb./ac.
S.E. of differential response = 100.2 lb./ac.

---

**Crop**: Gram (*Rabi*).

**Site**: Agri. Res. Stn., Vijapur.

**Object**: To study the effect of different micro-nutrients on the yield of Gram.

**BASAL CONDITIONS**:
(i) (a) Nil. (b) *Bajra*. (c) N.A. (ii) (a) Sandy loam. (b) N.A. (iii) 13.11.1957. (iv) (a) 4 ploughings and 4 harrowings. (b) Drilling. (c) 30 lb./ac. (d) 12" between rows. (e) N.A. (v) 1 lb. ac. of N as A/S broadcast and 50 lb./ac. of P₂O₅ as Super. (vi) Local. (vii) Irrigated. (viii) One interculturing. (ix) About 17". (x) 7.3.1958 to 9.3.1958.

**TREATMENTS**:
Same as in expt. no. 55(59) on pages 238.

**DESIGN**:
Same as in expt. no. 56(70) on page 239.

**GENERAL**:
(i) Normal. (ii) Nil. Dusting with 10% of Gammexane. (iii) Grain and fodder yield, germination, flowering, plant height and root study. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

**RESULTS**:
(i) 735 lb./ac. (ii) 185.8 lb./ac. (iii) Interaction Mn x Mo alone is significant. (iv) Mean and differential responses in lb./ac.
Crop :- Gram (Rabi).
Site :- Agri. Res. Stn., Vijapur.

Object :- To study the effect of different micro-nutrients on the yield of Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) 3 C.L./ac. of F.Y.M. (ii) (a) Sandy loam. (b) N.A. (iii) 7.11.1958. (iv) (a) Three ploughings and 2 harrowings. (b) Drilling. (c) 30 lb./ac. (d) 12' between rows. (e) N.A. (v) 10 lb./ac. of N as A/S and 50 lb./ac. of P₂O₅ as Super on 6.11.1958. (vi) Local. (vii) Irrigated. (viii) One interculturing. (ix) 25.77". (x) 15.3.1959/16.3.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 56(70) on page 239.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain and fodder yield, plant height, length and breadth. (iv) (a) 1955—1958. (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 687 lb./ac. (ii) 158.2 lb./ac. (iii) None of the effects is significant. (iv) Mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th>Differential response</th>
<th>Zn</th>
<th>Mn</th>
<th>Cu</th>
<th>Mo</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean response</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>4.76</td>
<td>60.34</td>
<td>54.34</td>
<td>21.98</td>
<td>36.98</td>
</tr>
<tr>
<td>S.E. of mean response</td>
<td>27.97 lb./ac.</td>
<td>39.55 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Gram (Rabi).

Object :- To study the performance of different varieties of Gram with different doses of phosphatic manures.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrula. (iii) 20.11.1956. (iv) (a) Nil. (b) Drilling. (c) N.A. (d) 18' between rows. (e) —. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 13.3.1957.

2. TREATMENTS:
   Main-plot treatments:

   Sub-plot treatments:
   3 doses of manures: P₀=0, P₁=27, P₂=54 lb./ac. of P₂O₅ as Single Super applied in furrows at the time of sowing.

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/block, 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 34’×12’. (b) 28’×9’. (v) 3’×1.5’. (vi) Yes.
4. GENERAL:
(i) N.A.  (ii) Nil.  (iii) Pod yield.  (iv) (a) 1956—contd.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 587 lb./ac.  (ii) (a) 96.63 lb./ac.  (b) 78.48 lb./ac.  (iii) Main effect of V is significant. None of the other effects is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>( V_4 )</th>
<th>( V_5 )</th>
<th>( V_6 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_0 )</td>
<td>481</td>
<td>494</td>
<td>615</td>
<td>389</td>
<td>732</td>
<td>569</td>
<td>547</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>650</td>
<td>550</td>
<td>729</td>
<td>434</td>
<td>722</td>
<td>565</td>
<td>608</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>563</td>
<td>555</td>
<td>659</td>
<td>553</td>
<td>748</td>
<td>563</td>
<td>607</td>
</tr>
<tr>
<td>Mean</td>
<td>565</td>
<td>533</td>
<td>668</td>
<td>459</td>
<td>734</td>
<td>566</td>
<td>587</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. \( V \) marginal means = 55.79 lb./ac.
2. \( P \) marginal means = 32.04 lb./ac.
3. \( P \) means at the same level of \( V \) = 78.48 lb./ac.
4. \( V \) means at the same level of \( P \) = 84.96 lb./ac.

---

**Crop:** Gram *(Rabi)*.  
**Site:** Agri. Res. Stn., Umrala.  
**Ref:** Gj. 57(82).  
**Type:** ‘MV’.

Object:—To study the performance of different varieties of Gram with different doses of phosphatic manures.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Groundnut.  (c) Nil.  (ii) (a) Medium black.  (b) Refer soil analysis, Umrala.  (iii) 2.11.1957.  (iv) (a) Two harrowings.  (b) to (e) N.A.  (v) Nil.  (vi) As per treatments.  (vii) Irrigated.  (viii) N.A.  (ix) Nil.  (x) 28.2.1958.

2. TREATMENTS:
Same as in expt. no. 56(106) on page 241.

3. DESIGN:
(i) Split-plot.  (ii) (a) 6 main-plots/block, 3 sub-plots/main-plot.  (b) N.A.  (iii) 3.  (iv) (a) 12’x18’.  (b) 9’x15’.  (v) 14’x14’.  (vi) Yes.

4. GENERAL:
(i) Good.  (ii) Nil.  (iii) Average number of pods, wt. of pods/plant, no. of grains/plant and grain yield.  (iv) (a) 1956—57.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 548 lb./ac.  (ii) (a) 112.1 lb./ac.  (b) 134.6 lb./ac.  (iii) Main effect of \( P \) is highly significant. Other effects are not significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>( V_4 )</th>
<th>( V_5 )</th>
<th>( V_6 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_0 )</td>
<td>508</td>
<td>502</td>
<td>416</td>
<td>515</td>
<td>361</td>
<td>416</td>
<td>453</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>677</td>
<td>529</td>
<td>565</td>
<td>623</td>
<td>564</td>
<td>494</td>
<td>575</td>
</tr>
<tr>
<td>( P_2 )</td>
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<td>593</td>
<td>510</td>
<td>610</td>
<td>739</td>
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<tr>
<td>Mean</td>
<td>601</td>
<td>541</td>
<td>497</td>
<td>583</td>
<td>555</td>
<td>514</td>
<td>548</td>
</tr>
</tbody>
</table>
Crop :- Gram.  
Ref :- Gj. 54(5).  
Type :- ‘C’.

Object :- To find out a suitable spacing and economic seed rate for Gram.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Wheat. (c) Nil.  (ii) (a) Medium to deep black. (b) Refer soil analysis, Arnej.  
   (iii) 22.10.1954.  (iv) (a) 5 harrowings. (b) Drilled. (c) and (d) As per treatments.  (e) N.A.  
   (vi) Chafa (medium).  (vii) Unirrigated.  

2. TREATMENTS :
   Main-plot treatments :
   3 spacings: \( S_1 = 12" \), \( S_2 = 15" \) and \( S_3 = 18" \). 
   Sub-plot treatments :
   3 seed rates: \( R_1 = 20 \), \( R_2 = 30 \) and \( R_3 = 40 \) lb./ac.

3. DESIGN :
   (i) Split-plot.  
   (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot.  

4. GENERAL :
   (i) Good.  
   (ii) and (iii) Nil.  
   (iv) (a) 1953—N.A.  

RESULTS :
   (i) 317 lb./ac.  
   (ii) (a) 61.71 lb./ac.  
   (b) 49.01 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R_1 )</td>
<td>338</td>
<td>287</td>
<td>294</td>
<td>306</td>
</tr>
<tr>
<td>( R_2 )</td>
<td>323</td>
<td>332</td>
<td>348</td>
<td>334</td>
</tr>
<tr>
<td>( R_3 )</td>
<td>320</td>
<td>312</td>
<td>332</td>
<td>311</td>
</tr>
<tr>
<td>Mean</td>
<td>317</td>
<td>310</td>
<td>324</td>
<td>317</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. S marginal means  
2. R marginal means  
3. \( R \) means at the same level of \( S \)  
4. \( S \) means at the same level of \( R \)
2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 54(5) on page 243.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Weight of grain. (iv) (a) 1953—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 246 lb./ac. (ii) (a) 26.32 lb./ac. (b) 29.95 lb./ac. (iii) Effect S 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>R₁</td>
<td>262</td>
<td>231</td>
<td>232</td>
<td>242</td>
</tr>
<tr>
<td>R₂</td>
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<td>246</td>
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<tr>
<td>R₃</td>
<td>270</td>
<td>230</td>
<td>248</td>
<td>249</td>
</tr>
</tbody>
</table>

Mean

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

Crop :- Gram (Rabi).
Object :- To find out suitable spacing and economic seed rate for Gram.

Ref :- Gj. 56(2).
Type :- 'C'.

1. BASAL CONDITIONS:
   (i) a: Gram—Wheat. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Arnej. (iii) N.A. (iv) a: 5 harrowings. (b) N.A. (c) and (d) As per treatments. (e) N.A. (f) Nil. (vi) Chafu (medium). (vii) Unirrigated. (viii) 1 weeding. (ix) 39°. (x) N.A.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 54(5) on page 243.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Low yields due to heavy rains. (vii) Nil.

5. RESULTS:
   (i) 281.3 lb./ac. (ii) 'a. 60.12 lb./ac. (b) 30.45 lb./ac. (iii) Interaction S×R 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>Mean</th>
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</thead>
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<td>274</td>
</tr>
<tr>
<td>R₂</td>
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<tr>
<td>R₃</td>
<td>276</td>
<td>309</td>
<td>284</td>
<td>290</td>
</tr>
</tbody>
</table>

Mean

S.E. of difference of two
1. S marginal means
2. R marginal means
3. R means at the same level of S
4. S means at the same level of R
Object:—To ascertain the proper spacing, seed rate and manurial dose to Gram to get maximum yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Light and reddish colour. (b) N.A. (iii) 22.10.1955. (iv) (a) N.A. (b) Dibbling. (c) and (d) As per treatments. (e) N.A. (v) (a) Chafa. (vi) Unirrigated. (vii) 3 weedings. (ix) 1.68". (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2), (3), (4) and (5)
   (1) 2 levels of N as A/S: N₀=0 and N₁=10 lb./ac.
   (2) 2 levels of P₂O₅ as Super: P₀=0 and P₁=50 lb./ac.
   (3) 2 levels of K₂O as Pot. Sul.: K₀=0 and K₁=50 lb./ac.
   (4) 2 seed rates: R₁=30 and R₂=40 lb./ac.
   (5) 2 spacings: S₁=10" and S₂=15".

3. DESIGN:
   (i) 2⁵ confd. (ii) (a) 8 plots/block; 4 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 25'×22.5'. (b) 20'×17.5'. (v) 2.5'×2.5'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 246.42 lb./ac. (ii) 73.55 lb./ac. (iii) Main effects of N and P are highly significant. Main effects of R, S and interaction K×R are significant. All other effects are not significant. (iv) Mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>Mean response</th>
<th>N</th>
<th>P</th>
<th>K</th>
<th>R</th>
<th>S</th>
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<tbody>
<tr>
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<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>N</td>
<td>86.19</td>
<td>75.69</td>
<td>96.69</td>
<td>65.81</td>
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<td>P</td>
<td>73.97</td>
<td>63.47</td>
<td>84.47</td>
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<td>K</td>
<td>30.65</td>
<td>10.27</td>
<td>51.03</td>
<td>24.34</td>
<td>85.64</td>
<td>-10.34</td>
</tr>
<tr>
<td>R</td>
<td>46.59</td>
<td>20.22</td>
<td>72.96</td>
<td>12.37</td>
<td>80.81</td>
<td>5.60</td>
</tr>
</tbody>
</table>

S.E. of mean response = 18.39 lb./ac.  
S.E. of differential response = 26.00 lb./ac.

Object:—To ascertain the proper spacing, seed rate and manurial dose to Gram to get maximum yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Light and reddish colour. (b) N.A. (iii) 12 and 13.10.1956. (iv) (a) N.A. (b) Dibbling. (c) and (d) As per treatments. (e) N.A. (v) (a) Chafa. (vi) Unirrigated. (vii) Nil. (ix) 108.7". (x) 4 and 5.2.1957.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no 55(104) above.
4. **GENERAL:**
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) 'a' No. (b) Nil. (vi) and (vi) Nil.

5 **RESULTS:**
   (i) 676.0 lb./ac. (ii) 227.8 lb./ac. (iii) Only N effect is significant. (iv) Mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th>Differential response</th>
<th>N</th>
<th>P</th>
<th>K</th>
<th>R</th>
<th>S</th>
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<td>N 179.5</td>
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<tr>
<td>P -45.5</td>
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<tr>
<td>K 4.5</td>
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<td>R -15.0</td>
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<tr>
<td>S -83.5</td>
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</tbody>
</table>

S.E. of mean response = 56.94 lb./ac.
S.E. of differential response = 80.51 lb./ac.

**Crop:** Gram (Rabi).

**Site:** Agri. Res. Stn., Waghai.

**Object:** To ascertain the proper spacing, seed rate and manurial dose to Gram to get maximum yield.

1. **BASAL CONDITIONS:**
   (i) 'a' Nil. (b) Tur. (c) Nil. (ii) (a) Light and reddish colour; (b) N.A. (iii) 29, 30.9.1957, 1.10.1957. (iv) (a) Three ploughings and 3 harrowings. (b) Dibbling. (c) and (d) As per treatments. (e) N.A. 'v' Nil. (vii) Chafa. (vii) Unirrigated. (viii) Nil. (ix) 48.70°. (x) 13, 14.1.1958.

2. **TREATMENTS and 3. DESIGN:**
   Same as in expt. no. 55(104) on page 245.

4. **GENERAL:**
   (i) Poor. (ii) Nil. (iii) Grain yield. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) 'a' and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 354 lb./ac. (ii) 81.34 lb./ac. (iii) Only S effect is highly significant. (iv) Mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th>Differential response</th>
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<th>K</th>
<th>R</th>
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<td></td>
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<tr>
<td>P 8</td>
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<td>R 39</td>
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<tr>
<td>S -61</td>
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</table>

S.E. of mean response = 20.33 lb./ac.
S.E. of differential response = 28.75 lb./ac.
Crop :- Gram (Rabi).

Object :- To find out the suitable number of irrigations for Gram.

1. BASAL CONDITIONS:
   (i) (a) Bajra—Gram. (b) Paddy. (c) —. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 9.11.1955. (iv) (a) One ploughing. (b) Drilling. (c) 40 lb./ac. (d) 18" between rows. (e) N.A. (v) Nil. (vi) Local. (vii) As per treatments. (viii) Nil. (ix) N.A. (x) 18.3.1956.

2. TREATMENTS:
   3 levels of irrigation: I₀ = 0, I₁ = 1 and I₂ = 2 irrigations.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) 51'×18'. (b) 45'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 667 lb./ac. (ii) 109.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

   Treatment  | I₀  | I₁  | I₂  
   Av. yield  | 694 | 621 | 686 |
   S.E./mean  |     |     | -48.93 lb./ac.

Crop :- Gram (Rabi).

Object :- To find out the suitable number of irrigations for Gram.

1. BASAL CONDITIONS:
   (i) (a) Bajra—Gram—Groundnut. (b) Paddy. (c) —. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 3.10.1956. (iv) (a) 2 ploughings. (b) Drilling. (c) 20 lb./ac. (d) 18" between rows. (e) —. (v) Nil. (vi) N.A. (vii) As per treatments. (viii) Nil. (ix) N.A. (x) 5.3.1957.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 55(105) above.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 362 lb./ac. (ii) 68.57 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

   Treatment  | I₀  | I₁  | I₂  
   Av. yield  | 253 | 328 | 506 |
   S.E./mean  |     |     | -28.00 lb./ac.

Crop :- Gram (Rabi).

Object :- To find out suitable spacing and number of irrigations for Gram.
1. BASAL CONDITIONS:
   (i) 'a' Nil. 'b' Groundnut. 'c' Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 2.12.1956. (iv) (a) N.A. 'b' Drilling. (c) N.A. (d) As per treatments. (e) N.A. (v) 36 lb./ac. of P₂O₅ as Super. (vi) Chafa. (vii) As per treatments. (viii) and (ix) N.A. (x) 15.3.1957.

2. TREATMENTS:
   Main-plot treatments:
   2 spacings between rows : S₁=9" and S₂=18".
   Sub-plot treatments:
   3 levels of irrigation : I₀=0, I₁=1 and I₂=2 irrigations.

3. DESIGN:
   (i) Split-plot. (ii) 2 main-plots/block, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 24'×18'. (b) 18'×12'. (v) 3'×3'. (vi) Chafa. (vii) As per treatments. (viii) and (ix) N.A. (x) 15.3.1957.

4. GENERAL:
   (i) Normal. 'ii' Nil. (iii) Pods yield. (iv) (a) 1956—contd. (b) No. 'c' Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 692 lb./ac. (ii) (a) 54.65 lb./ac. (b) 82.72 lb./ac. (iii) I effect alone is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>I₀</th>
<th>I₁</th>
<th>I₂</th>
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<td>626</td>
<td>634</td>
<td>839</td>
<td>700</td>
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<tr>
<td>S₂</td>
<td>518</td>
<td>720</td>
<td>815</td>
<td>684</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. S marginal means =22.32 lb./ac.
2. 1 marginal means =41.37 lb./ac.
3. 1 means at the same level of S =58.49 lb./ac.
4. S means at the same level of I =52.71 lb./ac.

Crop :- Gram (Rabi).
Object :-To find out the suitable spacing and number of irrigations for Gram.

1. BASAL CONDITIONS:
   (i) 'a' Nil. 'b' Bajra. 'c' N.A. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 13.11.1957 (iv) (a) One ploughing and 2 harrowings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) 36 lb./ac. of P₂O₅ as Super. (vi) Chafa (medium). (vii) As per treatments. (viii) N.A. (ix) Nil. (x) 2.2.1957.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 56.107; on page 247, 248.

4. GENERAL:
   (i) Good. 'ii' Nil. 'iii' Number of branches, no. of pods, no. of grains, wt. of grains/plant, wt. of 100 grains ; grain and fodder yield. (iv) (a) 1956—1957. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 459 lb./ac. (ii) (a) 522.3 lb./ac. (b) 125.0 lb./ac. (iii) I effect alone is significant. (iv) Av. yield of grain in lb./ac.

Ref :- Gj. 57(83).
Type :- 'IC'.
Crop: Sugarcane.

Object: To study the effect of N and P on Sugarcane yield.

1. BASAL CONDITIONS:
   (i) (a) Sugarcane—Paddy—Sugarcane. (b) Paddy. (c) S.C.L./ac. of F.Y.M.+100 lb./ac. of A/S+300 lb./ac. of G.I.
   (ii) (a) Black soil. (b) N.A. (iii) 2.1.1954. (iv) (a) to (e) N.A. (v) Nil. (vi) CO. 419 (medium).
   (vii) Irrigated. (viii) 4 weedings and 3 top-dressings. (ix) 81.14". (x) 20.2.1955.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of A/S: N1=120, N2=170 and N3=220 lb./ac.
   (2) 2 levels of P2O5 as Super: P0=0 and P1=100 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) 31.5'x55.25'. (b) 24.5'x44.45'. (v) 2 rows.
   (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Top-shoot borer. Dead hearts removed. (iii) Germination counts. Tillering count, no. of internodes and cane yield. (iv) (a) 1953—1955. (b) and (c) N.A. (v) (a) and (b) N.A.
   (vi) and (vii) Nil.

4. RESULTS:
   (i) 39.92 ton/ac. (ii) 3.85 ton/ac. (iii) Only the effect of N is significant (iv) Av. yield of grain in ten/ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
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<tbody>
<tr>
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<td>37.92</td>
<td>41.78</td>
<td>38.92</td>
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<tr>
<td>P1</td>
<td>36.71</td>
<td>39.42</td>
<td>46.64</td>
<td>40.92</td>
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<td>Mean</td>
<td>36.89</td>
<td>38.67</td>
<td>44.21</td>
<td>39.92</td>
</tr>
</tbody>
</table>

S.E. of N marginal mean = 1.36 ton/ac.
S.E. of P marginal mean = 1.11 ton/ac.
S.E. of body of table = 1.92 ton/ac.

Crop: Sugarcane.

Ref: Gj. 54(78).
Type: 'M'.

Object: To study the effect of N and P on Sugarcane yield.
1. BASAL CONDITIONS:

(i) 'a' Paddy—Sugarcane. 'b' Paddy. (c) Nil.  
(ii) (a) Medium black. 'b' N.A.  
(iii) 12.1.1955.  
(iv) (a) and 'b' N.A.  
(vi) CO. 419.  
(vii) Irrigated.  
(viii) 5 weedings and 3 earthings.  
(ix) 77.97.  
(x) 17.1.1956 to 23.1.1956.

2. TREATMENTS:

Same as in expt. no. 54(78) on page 249.

3. DESIGN:

(i) 3 x 2 Fact. in R.B.D.  
(ii) 6. 
(iii) 4.  
(iv) (a) 53.25' x 24.5'. (b) 47.0, x 17.5'.  
(v) One row on either side, 4.12' at either end.  
(vi) Yes.

4. GENERAL:

(i) Normal.  
(ii) Attack of stem borer and top shoot borer.  
Control measures taken N.A.  
(iii) Height, no. of tillers, no. of internodes and germination count.  
(iv) (a) 1953—contd. (b) and (c) N.A.  
(v) (a) and (b) N.A.  
(vi) Yes.  
(vii) Nil.

5. RESULTS:

(i) 31.50 ton/ac.  
(ii) 1.50 ton/ac.  
(iii) Only the effect of N is significant.  
(iv) Av. yield of cane in ton/ac.

<table>
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<td>30.67</td>
<td>30.83</td>
<td>32.85</td>
<td>31.50</td>
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</table>

S.E. of N marginal mean =0.53 ton/ac.
S.E. of P marginal mean =0.44 ton/ac.
S.E. of body of table =0.75 ton/ac.

Crop :- Sugarcane.  
Site :- Agri. Res. Stn., Vyara.

Ref :- Gj. 54(79).  
Type :- 'M'.

Object :- To study the effect of N as A/S, G.N.C. and F.Y.M. on Sugarcane yield.

1. BASAL CONDITIONS:

(i) (a) Sugarcane—Paddy—Sugarcane. (b) Paddy. (c) 5 C.L./ac. of F.Y.M.+100 lb./ac. of A/S+300 lb./ac. of G.N.C.  
(ii) (a) Black soil. (b) N.A.  
(iii) 28.1.1954.  
(iv) (a) to (e) N.A.  
(v) Nil.  
(vi) CO. 419. (medium).  
(vii) Irrigated.  
(viii) N.A.  
(ix) 81.14.  
(x) 10.2.1955.

2. TREATMENTS:

Main-plot treatments :  
2 levels of F.Y.M. : F1 =10 and F2 =20 C.L./ac.

Sub-plot treatments :  
3 ratios of A/S and G.N.C. to give 120 lb./ac. of N : N1=0 : 1, N2=1 : 1 and N3=1 : 2.

3. DESIGN:

(i) Split-plot.  
(ii) (a) 2 main-plots/block and 3 sub-plots/main-plot. (b) N.A.  
(iii) 6.  
(iv) (a) 31.5' x 35.25'. (b) 24.5' x 44.45'.  
(v) Two rows on sides.  
(vi) Yes.

4. GENERAL:

(i) Satisfactory.  
(ii) Top shoot borer. Dead hearts removed.  
(iii) Germination count, tillering count, no. of internodes and cane yield.  
(iv) (a) 1950—1954. (b) and (c) N.A.  
(v) (a) and (b) N.A.  
(vi) and (vii) Nil.

5. RESULTS:

(i) 37.48 ton/ac.  
(ii) (a) 3.15 ton/ac.  
(b) 2.56 ton/ac.  
(iii) N.A.  
(iv) Av. yield of cane in ton/ac.
Crop :- Sugarcane.  
Site :- Agri. Res. Stn., Vyara.  
Object :-To find out the effect of N, P and K on Sugarcane yield.

1. BASAL CONDITIONS:
(i) (a) Sugarcane-Paddy-Sugarcane. (b) Paddy. (c) G.M.+40 lb./ac. of N+20 lb./ac. of P₂O₅. (ii) (a) Black. (b) N.A. (iii) 15.1.1959. (iv) (a) Three ploughings and one harrowing. (b) Wet planting. (c) 10,000 setts/ac. (d) 3.5' between rows. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) CO. 419 (medium). (vii) Irrigated. (viii) 8 hand weedings. (ix) 94°. (x) 13.2.1960.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S: N₁=80, N₂=100 and N₃=120 lb./ac.
(2) 3 levels of P₂O₅: P₀=0, P₁=50 and P₂=100 lb./ac.
(3) 3 levels of K₂O as Pot. Sul.: K₁=50, K₂=100 and K₃=150 lb./ac.

3. DESIGN:
(i) 3³ Fact. confd. (ii) (a) 2 plots/block; 9 blocks/replication. (b) 220.5' x 150'. (iii) 2. (iv) (a) 50' x 24.5'. (b) 43.50' x 17.5'. (v) One guard row on either side and 3' border at both ends. (vi) Yes.

4. GENERAL:
(i) Healthy. No lodging. (ii) Incidence of Pyrilla. Dusted with 5% B.H.C. (iii) Cane yield. (iv) (a) 1959- contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 24.57 ton/ac. (ii) 3.97 ton/ac. (iii) Interaction P x K alone is significant. (iv) Av. yield of cane in ton/ac.

<table>
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<th>N₃</th>
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<td>25.79</td>
</tr>
<tr>
<td>P₂</td>
<td>21.12</td>
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</tr>
<tr>
<td>Mean</td>
<td>24.00</td>
<td>25.09</td>
<td>24.61</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 0.94 ton/ac.
S.E. of body of any table = 1.62 ton/ac.
Crop :- Sugarcane.  
Site :- Agri. Res. Stn., Vyara.  
Object :-To study the effect of manures and intercropping on Sugarcane yield.

1. BASAL CONDITIONS:
   (i) Sugarcane—Paddy. (b) Paddy. (c) G.M., 40 lb./ac. of N as A/S and 20 lb./ac. of P₂O₅.  
   (d) Black soil. (e) N.A.  
   (f) 14.1.1959. (g) (a) and (b) N.A.  
   (h) 10,000 sets/ac. (i) N.A.  
   (j) 10 C.L./ac. of F.Y.M. (k) CO—419 (medium).  
   (l) Irrigated. (m) 8 weedings. (n) 94'. (o) 19 and 20.2.1960.

2. TREATMENTS:
   1. 120 lb./ac. of N as A/S + 50 lb. ac. of P₂O₅.  
   2. 120 lb./ac. of N as A/S + 50 lb. ac. of P₂O₅ + Sanan on ridges.  
   3. 120 lb./ac. of N as A/S + 50 lb./ac. of P₂O₅ + Sesbania on ridges.  
   4. 150 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 5. (b) 122' x 44.45'. (iii) 3. (iv) (a) 44.45' x 24.5'. (b) 37.45' x 17.5'. (v) 3.5' at both ends; one guard row on each side. (vi) Yes.

4. GENERAL:
   (i) Healthy. No lodging. (ii) No. (iii) Cane yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 25.08 ton/ac.  
   (ii) 1.43 ton/ac.  
   (iii) Treatments do not differ significantly. (iv) Av. yield of cane in ton/ac.

   Treatment | 1 | 2 | 3 | 4 | 5  
---|---|---|---|---|---  
Av. yield | 24.32 | 25.23 | 25.36 | 24.83 | 25.68  
S.E./mean | =0.82 ton/ac.

Crop :- Sugarcane.  
Site :- Agri. Res. Stn., Vyara.  
Object :-To find out a suitable ratio of A/S and G.N.C. for top-dressing with different levels of F.Y.M.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Sugarcane. (b) Paddy. (c) N.A. (ii) (a) Medium black. (b) N.A.  
   (iii) 11.1.1955. (iv) (a) and (b) N.A.  
   (v) 12,000 three—budded sets/ac. (vi) 3.5' between rows. (e) N.A.  

2. TREATMENTS:
   All combinations of (I) and (2)+3 extra treatments
   (1) 2 levels of F.Y.M. : F₀=0 and F₁=10 C.L./ac.  
   (2) 3 ratios of A/S and G.N.C. to give 120 lb./ac. of N : R₁ = 1 : 0, R₂ = 1 : 1 and R₃ = 2 : 1.  
   Extra treatments:
   T₁ = 15 C.L./ac. of F.Y.M. + 120 lb./ac. of N as A/S.  
   T₂ = 10 C.L./ac. of F.Y.M. + 120 lb./ac. of N as A/S + 100 lb./ac. of P₂O₅.  
   T₃ = 15 C.L./ac. of F.Y.M. + 170 lb./ac. of N as A/S + 10 lb./ac. of P₂O₅.  
   Source of P₂O₅ N.A.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 31.5' x 55.25'. (b) 24.5' x 44.45'. (v) One row on either side and 5.4' at either end. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Stem borer 2% and top shoot borer 7% observed. Control measures—N.A. (iii) Germination count, no. of internodes, tiller count and cane yield. (iv) (a) 1950—contd. (modified in 1955). (b) No. (c) Nil. (d) 'a' and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
   (i) 32.32 ton/ac.  (ii) 2.01 ton/ac.  (iii) None of the effects is significant.  (iv) Av. yield of cane in ton/ac.

   \[ T_1 = 33.18 \text{ ton/ac.}; \quad T_2 = 30.83 \text{ ton/ac.}; \quad T_3 = 30.72 \text{ ton/ac.} \]

   \[
   \begin{array}{c|ccc|c}
   & R_1 & R_2 & R_3 & \text{Mean} \\
   F_0 & 32.25 & 32.39 & 31.82 & 32.15 \\
   F_1 & 33.67 & 33.38 & 32.69 & 33.25 \\
   \text{Mean} & 32.96 & 32.88 & 32.25 & 32.70 \\
   \end{array}
   \]

   S.E. of F marginal mean = 0.58 ton/ac.
   S.E. of R marginal mean = 0.71 ton/ac.
   S.E. of body of table = 1.00 ton/ac.

---

**Crop:** Sugarcane.  
**Site:** Agri. Res. Stn., Vyara.  
**Ref:** Gj. 56(76).  
**Type:** ‘M’.

Object:—To find out a suitable ratio of A/S and G.N.C. for top dressing with different levels of F.Y.M.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Sugarcane.  (b) Paddy.  (c) G.M.+42 lb./ac. of N.  (ii) (a) Black soil.  (b) N.A.  (iii) 2 and 3.1.1956.  (iv) (a) and (b) N.A.  (c) 12,000 setts/ac.  (d) 3½' between rows.  (e) N.A.  (v) Nil.  (vi) CO—419.  (vii) Irrigated.  (viii) 4 weedings, 3 interculturings and 2 earthing.  (ix) 94.29°.  (x) First week of February, 1957.

2. TREATMENTS:
   Same as in expt. no. 55(64) on page 252.

3. DESIGN:
   (i) R.B.D.  (ii) 9.  (b) 165.75' x 94.5'.  (iii) 4.  (iv) (a) 55.25' x 31.5'.  (b) 44.45' x 24.5'.  (v) One row on either side, 5.4' at either end.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) Stem-borer and top shoot borer attack.  (iii) Height, no of tillers, no of internodes, girth, germination count and cane yield.  (iv) (a) 1950—contd.  (b) and (c) No.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 29.96 ton/ac.  (ii) 1.67 ton/ac.  (iii) Only selective treatments vs. the rest treatments effect is significant.  (iv) Av. yield of sugarcane in ton/ac.

   \[ T_1 = 31.79 \text{ ton/ac.}; \quad T_2 = 30.21 \text{ ton/ac.}; \quad T_3 = 31.04 \text{ ton/ac.} \]

   \[
   \begin{array}{c|ccc|c}
   & R_1 & R_2 & R_3 & \text{Mean} \\
   F_0 & 29.85 & 28.93 & 29.06 & 29.28 \\
   F_1 & 30.53 & 28.38 & 29.88 & 29.59 \\
   \text{Mean} & 30.19 & 28.65 & 29.47 & 29.44 \\
   \end{array}
   \]

   S.E. of F marginal mean = 0.48 ton/ac.
   S.E. of R marginal mean = 0.59 ton/ac.
   S.E. of body of table = 0.83 ton/ac.
Object:—To study the effect of A/S and G.N.C. top dressed, with different levels of F.Y.M.

1. BASAL CONDITIONS:
(i) (a) Sugarcane—Paddy. (b) Paddy. (c) G.M.+40 lb./ac. of N+20 lb./ac. of P2O5. (ii) (a) Black soil. (b) N.A. (iii) 16.12.1956. (iv) (a) 3 ploughings; 1 harrowing and ridging. (b) Wet planting. (c) 10,000 setts/ac. (d) 3.5' between rows. (e) Nil. (vi) CO—419 (medium). (vii) Irrigated. (viii) 8 hand weedings. (ix) 31.53 ton/ac. (x) 16.12.1956.

2. TREATMENTS:
All combinations of (1) and (2)+3 extra treatments
(i) 3 ratios of A/S and G.N.C. at 120 lb./ac. of N as top dressing: R1=1 : 0. R2=1 : 1 and R3=2 : 1. (2) 2 levels of F.Y.M.: F0=0 and F1=10 lb./ac.
Extra treatments: T1=15 C.L./ac. of F.Y.M.+120 lb./ac. of N as A/S. T2=10 C.L./ac. of F.Y.M.+120 lb./ac. of N as A/S and T3=15 C.L./ac. of F.Y.M.+170 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) 9. (b) 165.75'<73.5'. (iii) 4. (iv) (a) 31.5'×55.25'. (b) 24.5'×44.45'. (v) One row on either side and 5.4' at either end. (vi) Yes.

4. GENERAL:
(i) Good. No lodging. (ii) Nil. (iii) Cane yield. (iv) (a) 1950—1958 (modified in 1955). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rain during July and August. (vii) Nil.

5. RESULTS:
(i) 31.53 ton/ac. (ii) 1.97 ton/ac. (iii) Effect of F is highly significant. Effects of T and T vs. others are significant. (iv) Av. yield of cane in ton/ac.
T1—31.04, T2—31.31 and T3—34.99 ton/ac.

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<td>F1</td>
<td>31.59</td>
<td>32.97</td>
<td>33.11</td>
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<tr>
<td>Mean</td>
<td>29.52</td>
<td>31.73</td>
<td>30.58</td>
<td>30.61</td>
</tr>
<tr>
<td>S.E. of R marginal mean</td>
<td>=0.70 ton/ac.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>S.E. of F marginal mean</td>
<td>=0.57 ton/ac.</td>
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<td></td>
</tr>
<tr>
<td>S.E. of body of table</td>
<td>=0.98 ton/ac.</td>
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</table>

Object:—To study the effect of A/S and G.N.C. as top dressing with different levels of F.Y.M.

1. BASAL CONDITIONS:
(i) (a) Sugarcane—Paddy. (b) Paddy. (c) G.M., 40 lb./ac. of N and 20 lb./ac. of P2O5. (ii) (a) Black soil. (b) N.A. (iii) 10.1.1958. (iv) (a) 3 ploughings, 1 harrowing and ridging. (b) Wet planting. (c) 10,000 setts/ac. (d) 3.5' between rows. (e) —. (vi) Nil. (vi) CO—419 (medium). (vii) Irrigated. (viii) 8 hand weedings. (ix) 88.75'. (x) 17.1.1959.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 56(119) on page 254.

4. GENERAL:
(i) Good; no lodging. (ii) Nil. (iii) Cane yield. (iv) (a) 1950—1958 (modified in 1955). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rain during July and August. (vii) Nil.
5. RESULTS:

(i) 28.42 ton/ac.  (ii) 2.53 ton/ac.  (iii) None of the effects is significant.  (iv) Av. yield of cane in ton/ac.

\[ T_1=29.39, T_2=28.97 \text{ and } T_3=29.29 \text{ ton/ac.} \]

<table>
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<tr>
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<th>( R_1 )</th>
<th>( R_2 )</th>
<th>( R_3 )</th>
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<td>25.62</td>
<td>28.63</td>
<td>26.95</td>
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<td>30.26</td>
<td>26.36</td>
<td>28.28</td>
<td>28.30</td>
</tr>
<tr>
<td>Mean</td>
<td>28.42</td>
<td>25.99</td>
<td>28.46</td>
<td>27.62</td>
</tr>
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</table>

S.E. of N marginal mean = 0.89 ton/ac.
S.E. of R marginal mean = 0.73 ton/ac.
S.E. of body of table = 1.26 ton/ac.

Crop :- Sugarcane.
Site :- Trial-Cum-Demonstration Farm, Bardoli.
Type :- 'CV'.

Object :- To find out the best time of planting for different varieties of Sugarcane.

1. BASAL-CONDITIONS:

(i) (a) Nil.  (b) Paddy.  (c) 12 C.L./ac. of compost + 200 lb./ac. of A/S + 100 lb./ac. of Super.
(ii) (a) 12 C.L./ac. of compost.  (b) Black soil.  (c) As per treatments.  (d) As per treatments.
(ii) (a) 2 ploughings.  (b) and (c) N.A.
(iii) Between rows 3’.  (c) N.A.  (v) 10 C.L./ac. of F.Y.M. in furrows + 60 lb./ac. of N as A/S + 60 lb./ac. of N as castor cake.
(iv) Irrigated.  (vii) 1 interculturing.  (ix) School time.
(x) N.A.

2. TREATMENTS:

Main-plot treatments:
4 dates of planting: \( D_1 = 30 \text{th November, 1959, } D_2 = 30 \text{th December, 1959, } D_3 = 28 \text{th January, 1960 and } D_4 = 24 \text{th February, 1960.} \)

Sub-plot treatments:
3 varieties: \( V_1 = CO - 740, V_2 = CO - 705 \text{ and } V_3 = CO - 419. \)

3. DESIGN:

(i) Split-plot.  (ii) 4 main-plots/replication; 3 sub-plots/main-plot.  (iii) 5.  (iv) (c) 35’x35’.  (b) 28’x30’.  (v) 3.5’x2.5’.  (vi) Yes.

4. GENERAL:

(i) Normal.  (ii) Nil.  (iii) Cane yield.  (iv) (a) 1959—contd.  (b) and (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 33.95 ton/ac.  (ii) (a) 4.30 ton/ac.  (b) 3.95 ton/ac.  (iii) Main effect of \( D \) alone is highly significant.  (iv) Av. yield of cane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>( D_1 )</th>
<th>( D_2 )</th>
<th>( D_3 )</th>
<th>( D_4 )</th>
<th>Mean</th>
</tr>
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<tbody>
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<td>( V_1 )</td>
<td>36.36</td>
<td>35.28</td>
<td>32.26</td>
<td>35.74</td>
<td>34.99</td>
</tr>
<tr>
<td>( V_2 )</td>
<td>33.97</td>
<td>35.94</td>
<td>27.89</td>
<td>35.68</td>
<td>33.37</td>
</tr>
<tr>
<td>( V_3 )</td>
<td>31.93</td>
<td>32.41</td>
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<tr>
<td>Mean</td>
<td>34.09</td>
<td>34.64</td>
<td>30.15</td>
<td>36.95</td>
<td>33.95</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. D marginal means = 1.58 ton/ac.
3. V means at the same level of D = 2.59 ton/ac.
4. D means at the same level of V = 2.57 ton/ac.
Crop :- Sugarcane.

Site :- Agri. Res. Stn., Vyara.

Object :- To study the effect of different depths of planting on the yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Sugarcane—Paddy—Sugarcane. (b) Paddy. (c) 40 lb./ac. of N as A/S—20 lb./ac. of P₂O₅+G.M. (ii) (a) Black. (b) N.A. (iii) 24.2.1959. (iv) (a) 3 ploughings and 1 harrowing. (b) N.A. (c) 10,000 setts/ac. (d) N.A. (e) —. (v) 10 C.L./ac. of F.Y.M. (vi) CO—419 (medium). (vii) Irrigated. (viii) 8 hand weedicings. (ix) 94°. (x) 18.2.1960.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 depths of ploughing : D₁ = 6" deep with wooden plough and D₂ = 18" deep.
   (2) 2 levels of P₂O₅ : P₀ = 0 and P₁ = 75 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 4. (b) 44.45' × 98'. (iii) 3. (iv) (a) 24.5' × 44.45'. (b) 17.5' × 37.45'. (v) 3.5' on both ends and one row on each side. (vi) Yes.

4. GENERAL:
   (i) Healthy. No lodging. (ii) Nil. (iii) Cane yield. (iv) (a) 1959—cond. (b) No. (c) Nil. (d) Nil. (e) Nil. (f) Nil. (g) Heavy rain during July and August. (h) Nil.

5. RESULTS:
   (i) 28.80 ton/ac. (ii) 1.66 ton/ac. (iii) None of the effects is significant. (iv) Av. yield of cane in ton/ac.

Crop :- Sugarcane.

Site :- Agri. Res. Stn., Vyara.

Object :- To find out the optimum dose of N and P₂O₅ and spacing between two rows for Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Paddy—Sugarcane. (b) Paddy. (c) Nil. (ii) (a) Black soil. (b) N.A. (iii) 28, 29.1.1956 and 25.2.1956. (iv) (a) and (b) N.A. (c) 12,000 3-budded setts/ac. (d) As per treatments. (e) N.A. (v) 10 C.L./ac. of F.Y.M. in furrows before planting. (vi) CO—419. (vii) Irrigated. (viii) 5 weedicings and 2 earthings. (ix) 94.29°. (x) 4 cuttings from 11.1.1957. to 8.3.1957.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of spacing : S₁ = 3', S₂ = 3.5' and S₃ = 4'.
   (2) 3 levels of N as A/S : N₁ = 180, N₂ = 240 and N₃ = 300 lb./ac.
   (3) 2 levels of P₂O₅ as Super : P₀ = 0 and P₁ = 100 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D (ii) (a) 18. (b) 168° × 150'. (iii) 4. (iv) (a) 27° × 50' for S₁, 28° × 50' for S₂ and S₃, (b) 21° × 38.85° (S₁ and S₂), 20° × 40.8° (S₃). (v) 1 row on either side. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Stem-borer attack 5% and top borer attack 1.5%. (iii) Height, germination count, girth, no. of internodes, no. of tillers and yield of cane. (iv) (a) 1956—cond. (b) Yes. (c) Nil. (d) Nil. (e) and (f) Nil.
5. RESULTS:

(i) 35.67 ton/ac.  (ii) 2.21 ton/ac.  (iii) Only the effect of S is highly significant.  (iv) Av. yield of cane in ton/ac.

<table>
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<td>34.11</td>
<td>35.67</td>
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</table>

S.E. of S or N marginal mean = 0.46 ton/ac.
S.E. of P marginal mean = 0.37 ton/ac.
S.E. of body of S X P or N X P table = 0.64 ton/ac.
S.E. of body of S X N table = 0.78 ton/ac.

Crop :- Sugarcane.

Site :- Agri. Res. Stn., Vyara.

Ref :- Gj. 57(122)/56(75).

Object :- To find out the optimum dose of N and P₂O₅ and spacing between rows for Sugarcane.

1. BASAL CONDITIONS:

(i) (a) Sugarcane—Paddy.  (b) Paddy.  (c) G.M.—42 lb./ac. of N.  (ii) (a) Black soil.  (b) N.A.  (iii) 18.1.1957.  (iv) (a) 3 ploughings, one harrowing and ridging.  (b) Wet planting.  (c) 10,000 setts/ac.  (d) As per treatments.  (e) N.A.  (v) 10 C.L./ac. of F.Y.M.  (vi) CO—419 (medium).  (vii) Irrigated.  (viii) 8 hand weedings.  (ix) 80.50”.  (x) 29.1.1958.

2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 56(75) on page 256.

4. GENERAL:

(i) Good.  (ii) Nil.  (iii) Cane yield.  (iv) (a) 1956—contd.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 34.15 ton/ac.  (ii) 3.91 ton/ac.  (iii) Main effect of S is highly significant and effect of N is significant.  (iv) Av. yield of cane in ton/ac.

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<td>35.05</td>
</tr>
</tbody>
</table>

S.E. of N or S marginal mean = 0.80 ton/ac.
S.E. of P marginal mean = 0.65 ton/ac.
S.E. of body of N X P or S X P table = 1.38 ton/ac.
S.E. of body of N X S table = 1.13 ton/ac.
Crop: Sugarcane.

Ref: Gj. 59(114).
Type: 'CM'.

Object: To find out the optimum dose of N and P with different spacings for Sugarcane crop.

1. BASAL CONDITIONS:
   (i) (a) Sugarcane—Paddy. (b) Paddy. (c) G.M.+40 lb./ac. of N+20 lb./ac. of P₂O₅.
   (ii) (a) Black soil. (b) N.A. (iii) 7.1.1958. (iv) (a) 3 ploughings, 1 harrowing and 1 ridging. (b) Wet planting. (c) 10,000 setts/acre. (d) As per treatments. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) CO—419 (medium). (vii) Irrigated. (viii) 8 hand weedings. (ix) 88.75”. (x) 8.2.1959.

2. TREATMENTS:
   All combinations of 1, 2, and 3:
   (1) 3 levels of N: N₁=100, N₂=125 and N₃=150 lb./ac.
   (2) 3 spacings between rows: S₁=3’, S₂=3.5’ and S₃=4’.
   (3) 2 levels of P₂O₅: P₀=0 and P₁=100 lb./ac.

3. DESIGN:
   Same as in expt. no. 56.75) on page 256.

4. GENERAL:
   (i) Good; no lodging. (ii) Nil. (iii) cane yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 35.06 ton/ac. (ii) 3.56 ton/ac. (iii) Effect of S is significant and interaction S×P is significant. (iv) Av. yield of cane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
<th>P₀</th>
<th>P₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
<td>34.61</td>
<td>35.52</td>
<td>32.89</td>
<td>34.34</td>
<td>33.57</td>
<td>35.13</td>
</tr>
<tr>
<td>N₂</td>
<td>35.47</td>
<td>36.81</td>
<td>33.00</td>
<td>35.09</td>
<td>34.31</td>
<td>35.88</td>
</tr>
<tr>
<td>N₃</td>
<td>37.03</td>
<td>37.17</td>
<td>33.06</td>
<td>35.75</td>
<td>35.40</td>
<td>36.11</td>
</tr>
<tr>
<td>Mean</td>
<td>35.70</td>
<td>36.50</td>
<td>32.98</td>
<td>35.06</td>
<td>34.43</td>
<td>35.71</td>
</tr>
</tbody>
</table>

S.E. of N or S marginal mean = 0.73 ton/ac.
S.E. of P marginal mean = 0.59 ton/ac.
S.E. of body of N×P or S×P table = 1.03 ton/ac.
S.E. of body of N×S table = 1.26 ton/ac.

Crop: Sugarcane.

Ref: Gj. 59(114).
Type: 'CM'.

Object: To find out the optimum dose of N and P with different spacing between rows for Sugarcane crop.

1. BASAL CONDITIONS:
   (i) (a) Sugarcane—Paddy—Sugarcane. (b) Paddy. (c) G.M.+40 lb./ac. of N+20 lb./ac. of P₂O₅. (ii) (a) Black soil. (b) N.A. (iii) 7.1.1959. (iv) (a) 3 ploughings, one harrowing and one ridging. (b) Wet planting. (c) 10,000 setts/acre. (d) As per treatments. (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) CO—419 (medium). (vii) Irrigated. (viii) 8 hand weedings. (ix) 94°. (x) 3.2.1960.

2. TREATMENTS:
   Same as in expt. no. 58(110) above.
3. DESIGN:
Same as in expt. no. 56(75) on page 256.

4. GENERAL:
(i) Healthy; no lodging. (ii) No. (iii) Cane yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 19.19 ton/ac. (ii) 4.50 ton/ac. (iii) Main effect of N alone is highly significant. (iv) Av. yield of cane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>P0</th>
<th>P1</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>16.93</td>
<td>16.75</td>
<td>15.37</td>
<td>16.35</td>
<td>16.21</td>
<td>16.50</td>
</tr>
<tr>
<td>N2</td>
<td>20.47</td>
<td>21.55</td>
<td>18.26</td>
<td>20.09</td>
<td>19.24</td>
<td>20.95</td>
</tr>
<tr>
<td>N3</td>
<td>21.55</td>
<td>22.29</td>
<td>19.49</td>
<td>21.11</td>
<td>22.21</td>
<td>20.02</td>
</tr>
<tr>
<td>Mean</td>
<td>19.65</td>
<td>20.20</td>
<td>17.71</td>
<td>19.19</td>
<td>19.22</td>
<td>19.15</td>
</tr>
<tr>
<td>P0</td>
<td>18.21</td>
<td>20.73</td>
<td>18.72</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P1</td>
<td>21.09</td>
<td>19.67</td>
<td>16.70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of N or S marginal mean = 0.92 ton/ac.
S.E. of P marginal mean = 0.75 ton/ac.
S.E. of body of N x P or S x P table = 1.30 ton/ac.
S.E. of body of N x S table = 1.59 ton/ac.

Crop: - Sugarcane.
Ref: - Gj. 57(121).
Type: - 'CM'.

Object: — To estimate the extent of deterioration in seed in successive years and possibility of improving it by manurial application.

1. BASAL CONDITIONS:
(i) (a) Sugarcane—Paddy. (b) Paddy. (c) G.M.; 40 lb./ac. of N + 20 lb./ac. of P₂O₅. (ii) (a) Black soil. (b) N.A. (iii) 19.1.1957. (iv) (a) 3 ploughings, 1 harrowing and ridging. (b) Wet planting. (c) 10,000 setts/ac. (d) 3.5' between rows. (e) —. (v) 10 C.L./ac. of F.Y.M. for treatments 1 to 5 only. (vi) CO—419 (medium). (vii) Irrigated. (viii) 8 hand weedings. (ix) 80.50°. (x) 9.3.1958.

2. TREATMENTS:
1. First year's seed.
2. Second year's seed.
3. Third year's seed.
4. Worst reported deteriorated seed (with usual dose of 120 lb./ac. of N as A/S and cake).
5. (4)+150 lb./ac. of P₂O₅.
6. (4)+200 lb./ac. of K₂O.
7. (4)+150 lb./ac. of P₂O₅+200 lb./ac. of K₂O.
8. (4)+150 lb./ac. of P₂O₅+200 lb./ac. of K₂O+Minor elements.
9. (5)+mixture of minor elements.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) 220.5° X 44.45°. (iii) 3. (iv) (a) 44.45° X 24.5°. (b) 32.45° X 17.5°. (v) One row on either side and 6' at each end. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Cane yield. (iv) (a) 1957—1959 (modified in 1959). (b) No. (c) Nil. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 35.99 ton/ac. (ii) 3.42 tons/ac. (iii) Treatments do not differ significantly. (iv) Av. yield of cane in ton/ac.
Crop: Sugarcane.

Object: To estimate the extent of deterioration in seed in successive years and possibility of improving it by manural application.

1. BASAL CONDITIONS:
   (i) a) Sugarcane—Paddy.  (b) Paddy.  (c) G.M.+40 lb./ac. of N+20 lb./ac. of P₂O₅.  (d) Blck soil.
   (b N.A.  iii 18.1.1958.  iv a) 3 ploughings, 1 harrowing and ridging.  (b) Wet planting.  3x 10,000
   setts/ac.  d 3.5' between rows.  e N.A.  v 10 C.L./ac. of F.Y.M. for treatments 1 to 5 only.  vi CO—419
   (medium)  vii Irrigated.  viii 8 hand weedings.  (ix) 88.75'.  (x) 18.1.1959.

2. TREATMENTS and DESIGN:
   Same as in exp. no. 57,121' on page 259.

4. GENERAL:
   (i) Good.  (ii) Nil.  iii Cane yield.  (iv) a) 1957—1959 (modified in 1959).  (b) No.  (c) Nil.  (v) a) and
   (b) Nil.  vii Heavy rains in July and August.  (vii) Nil.

5. RESULTS:
   (i) 38.39 ton/ac.  ii. 2.11 ton/ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of cane in ton/ac.

   Treatment  Av. yield  S.E./mean  =.1.22 ton/ac.
   1  2  3  4  5  6  7  8  9
   43.79 41.30 40.36 34.87 35.86 37.45 37.24 37.78 36.84

Crop: Sugarcane.

Object: To estimate the extent of deterioration in seed in successive years and possibility of improving it by the application of manures.

1. BASAL CONDITIONS:
   (i) a) Sugarcane—Paddy.  (b) Paddy.  (c) G.M.+40 lb./ac. of N+20 lb./ac. of P₂O₅.  (d) Blck soil.  (b)
   N.A.  (iii) 12.1.1959.  (iv a) 3 ploughings, 1 harrowing, and ridging.  (b) Wet planting.  (c) 10,000 setts/ac.
   d 3.5' between rows.  (c) N.A.  (v) 10 C.L./ac. of F.Y.M. to be given in furrows before planting.  (vi) CO—419

2. TREATMENTS:
   1. First year’s seed.
   2. Second year’s seed.
   3. Third year’s seed.
   4. Worst reported deteriorated seed.
   5. (a) +150 lb./ac. of P₂O₅.
   6. (a)+200 lb./ac. of K₂O.
   7. (a)+150 lb./ac. of P₂O₅+200 lb./ac. of K₂O.

3. DESIGN:
   (i) R.B.D.  (ii) a) 7.  (b) 171.5'x44.45'.  (iii) 3.  (iv) a) 44.45'x24.5'.  (b) 37.5'x17.5'.  (v) One row
   on either side and 3.5' at each end.  (vi) Yes.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Cane yield. (iv) (a) 1957—1959 (modified in 1959). (b) No. (c) Nil. (vi) (a) and (b) N.A. (vi) Heavy rain during monsoon. (vii) Nil.

5. RESULTS:
(i) 25.10 ton/ac. (ii) 2.37 ton/ac. (iii) Treatments do not differ significantly. (iv) Av. yield of cane in ton/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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>27.42</td>
<td>25.60</td>
<td>22.75</td>
<td>25.39</td>
<td>26.41</td>
<td>22.75</td>
<td>25.39</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=1.37 ton/ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif),
Object :- To study the effect of various fertilizers on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Cotton—Jowar or Bajra—Groundnut. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 9.7.1956. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) Between rows 3' and between plants—irregular. (e) N.A. (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P2O5 as triple Super drilled. (vi) Pratap (early). (vii) Unirrigated. (viii) 6 interculterings, 1 thinning and 2 weedings. (ix) 26.96". (x) Pickings on 15.11.1956 9.12.1956 and 8.1.1957.

2. TREATMENTS:
5 sources of 40 lb./ac. of N and a control: S0=0, S1=A/S, S2=Urea, S3=C/N, S4=Calcium cyanamide and S5=A/S/N.

All manures were spread and applied at the time of sowing.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 42'x30'. (b) 36'x24'. (v) 3'x3'. (vi) Yes.

4. GENERAL:
(i) Unequal growth and many gaps in each plot. (ii) Nil. (iii) Seed cotton and stalk yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) Surat. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 353 lb./ac. (ii) 68.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>278</td>
<td>414</td>
<td>338</td>
<td>385</td>
<td>330</td>
<td>370</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=34.0 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif),
Object :- To study the effect of various fertilizers on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 2.7.1957. (iv) (a) 4 harrowings. (b) Drilling. (c) 10 lb./ac. (d) 3' between rows. (e) N.A. (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P2O5 as triple Super. (vi) Pratap. (vii) Unirrigated. (viii) 4 interculterings. (ix) 27.42". (a) 1.11.1957 and 2.1.1958.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 56(8) above.
4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Kapas yield. (iv) (a) 1956—1958. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 258 lb./ac. (ii) 41.47 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>186</td>
<td>271</td>
<td>284</td>
<td>264</td>
<td>235</td>
<td>309</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20.73 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Cotton (Kharif).
Object:—To study the effect of various fertilizers on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Shallow, light black. (b) Refer soil analysis, Amreli. (iii) 2.7.1958.
   (iv) (a) 1 harrowing. (b) Drilling. (c) 15 lb./ac. (d) 36° between rows. (e) N.A. (v) 5 C.L./ac. of F.Y.M.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 56(8) on page 261.

4. GENERAL:
   (i) Below normal. (ii) Nil. (iii) Seed cotton. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) (a) and (b) N.A.
   (vi) Heavy rains in October (6° in 2 days). (vii) Nil.

5. RESULTS:
   (i) 250 lb./ac. (ii) 25.86 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>205</td>
<td>289</td>
<td>258</td>
<td>236</td>
<td>224</td>
<td>287</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12.93 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Cotton (Kharif).
Object:—To study the effect of different nitrogenous fertilizers on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Shallow, light black. (b) Refer soil analysis, Amreli. (iii) 11.7.1959.
   (iv) (a) One ploughing and two harrowings. (b) Dibbling. (c) 15 lb./ac. (d) 36° X 6°. (e) N.A. (v)
   20 lb. ac. of P₂O₅ as Super. (vi) C.J.—73. (vii) Unirrigated. (viii) 3 to 4 interculturings and 2 weedings
   (ix) 45.56°. (x) 18.11.1959 and 23.12.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 56(8) on page 261.

4. GENERAL:
   (i) Heavy rain badly affected the crop. (ii) Nil. (iii) Seed cotton. (iv) (a) 1956—1959. (b) No. (c) Nil.
   (v) (a) and (b) Nil. (vi) Heavy rains in October (5° in 2 days). (vii) Nil.
5. RESULTS

(i) 68 lb./ac. (ii) 20.47 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>35</td>
<td>93</td>
<td>105</td>
<td>34</td>
<td>64</td>
<td>77</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>10.23</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Type :- 'M'.
Object :- To study the effect of various phosphatic fertilizers on the performance and yield of Cotton crop.

1. BASAL CONDITIONS :

(i) (a) Cotton—Jowar or Bajra—Groundnut. (c) Groundnut. (N) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 9.7.1956. (iv) (a) N.A. (b) Drilling. (c) 10 lb./ac. (d) Between rows 3' and between plants—irregular. (e) N.A. (v) 5 C.L./ac. of F.Y.M. was given in June—40 lb./ac. of N in the form of A/S was spread in all the plots. (vi) Pratap (early). (vii) Unirrigated. (viii) 6 interculturings, 1 thinning and 2 weedications. (ix) 26.96°. (x) Pickings on 15.11.1956; 9, 10.12.1956 and 6, 9.1.1957.

2. TREATMENTS

5 sources of 20 lb./ac. of P₂O₅ and a control : S₀=Control, S₁=Super, S₂=B.M, S₃=Dicalcium phos., S₄=Hyper phos and S₅=Kotka phos. Phosphatic fertilizers were drilled in the plots. Cotton seeds were sown and covered by rapta.

3. DESIGN :

(i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) 42'X30'. (b) 36'X24'. (v) 3'X3'. (vi) Yes.

4. GENERAL :

(i) Unequal growth with many gaps in the plots. (ii) Nil. (iii) Seed cotton and stalk yield. (iv) (a) 1956—1959. (b) No. (c) N.A. (v) (a) Surat. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :

(i) 390 lb./ac. (ii) 47.0 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>331</td>
<td>405</td>
<td>382</td>
<td>451</td>
<td>377</td>
<td>395</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23.5</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Type :- 'M'.
Object :- To study the effect of various phosphatic fertilizers on the yield of Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 2.7.1957. (iv) (a) 4 harrowings. (b) Drilling. (c) 10 lb./ac. (d) 3' between rows. (e) N.A. (v) 5 C.L./ac. of F.Y.M.+40 lb./ac. of N as A/S. (vi) Pratap. (vii) Unirrigated. (viii) 5 interculturings. (ix) 27.42°. (x) 1.11.1957 and 2.1.1958.

2. TREATMENTS :

5 sources of 20 lb./ac. of P₂O₅ and a control : S₀=0, S₁=Triple Super, S₂=B.M., S₃=Dicalcium phos., S₄=Hyper phos. and S₅=Kotka phos. S₂ is not applied and treated as control.

3. DESIGN :

(i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) 42'X30'. (b) 36'X24'. (v) 3'X3'. (vi) Yes.
4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Kapas yield. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) There were no late rains and as such crop suffered.

5. RESULTS:
(i) 286 lb./ac. (ii) 44.15 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀+S₁</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>249</td>
<td>356</td>
<td>348</td>
<td>262</td>
<td>252</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any treatment mean other than control = 22.07 lb./ac.
S.E. of control mean = 15.61 lb./ac.

Crop :- Cotton (Kharif).
Ref :- Gj. 58(100).
Type :- 'M'.

Object :- To study the effect of various phosphatic fertilizers on the yield of Cotton.

1. BASAL CONDITIONS:
(i) a' Nil. (ii) b' and c' N.A. (iii) Shallow, light black. (b) Refer soil analysis, Amreli. (ii) 2.7.1958. (iii) a. One harrowing. (b) Drilling. (c) 15 lb./ac. (d) 36° between rows. (e) - . (v) 5 C.L./ac. of F.Y.M. (vi) C.J. - 73. (vii) Unirrigated. (viii) 2 interculturings. (ix) 28.76'. (x) 6.12.1958.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 57(7) on page 263.

4. GENERAL:
(i) Below normal. (ii) Nil. (iii) Seed cotton. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) (a' and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 263 lb./ac. (ii) 53.69 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀+S₁</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>239</td>
<td>253</td>
<td>283</td>
<td>239</td>
<td>325</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any treatment mean other than control = 26.85 lb./ac.
S.E. of control mean = 18.98 lb./ac.

Crop :- Cotton (Kharif).
Ref :- Gj. 59(97).
Type :- 'M'.

Object :- To study the effect of different phosphatic fertilizers on the yield of Cotton.

1. BASAL CONDITIONS:
(i) a' Nil. (ii) b' and c' N.A. (iii) Shallow, light black. (b) Refer soil analysis, Amreli. (ii) 11.7.1959. (iv) a' 1 ploughing and 2 harrowings. (b) Dibbling. (c) 15 lb./ac. (d) 36°×6'. (e) - . (v) 20 lb./ac. of N as A/S. (vi) C.J. - 73. (vii) Unirrigated. (viii) 3-4 interculturings and 2 weedings. (ix) 45.56'. (x) 18.11.1959 and 23.12.1959.

2. TREATMENTS:
5 sources of 20 lb./ac. of P₂O₅ and a control: S₀ = Control, S₁ =Triple Super, S₂ =B.M., S₃ =Dicalcium phos., S₄ =Hyper phos. and S₅ =Kotka phos.
Time and method of application N.A. As B.M. and Hyper phos. were not available these treatments were dropped from the experiment.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 42'×30'. (b) 36'×24'. (v) 3'×3'. (vi) Yes.
4. GENERAL

(i) Heavy rains affected the crop badly. (ii) Nil. (iii) Seed cotton. (iv) (a) 1956—1959. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Heavy rains in October (6" in 2 days). (vii) Nil.

5. RESULTS:

(i) 129 lb./ac. (ii) 30.30 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>95</td>
<td>188</td>
<td>101</td>
<td>132</td>
</tr>
</tbody>
</table>

S.E./mean = 15.15 lb./ac.

---

Crop :- Cotton (Kharif).
Site :- Agri. Res. Sta., Amreli.
Object :- To investigate the stabilising effect of N and its availability to Cotton in the soil.

1. BASAL CONDITIONS:


2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 levels of A/S: S0=0, S1=224 and S2=448 lb./ac.
(2) 3 levels of cellulose: C0=0, C1=2 and C2=5 tons/ac.

A/S was spread on 18.6.1954 and it was covered with cellulose material.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 27'×52'. (b) 15'×40'. (v) 6'×6'. (vi) Yes.

4. GENERAL:

(i) The growth was normal. (ii) Nil. (iii) Seed yield. (iv) (a) 1952—1954. (b) and (c) No. (v) (a) Surat. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 287 lb./ac. (ii) 51.00 lb./ac. (iii) C and S effects are significant while interaction is not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0</td>
<td>226</td>
<td>270</td>
<td>301</td>
<td>266</td>
</tr>
<tr>
<td>S1</td>
<td>239</td>
<td>295</td>
<td>304</td>
<td>279</td>
</tr>
<tr>
<td>S2</td>
<td>246</td>
<td>361</td>
<td>340</td>
<td>316</td>
</tr>
</tbody>
</table>

Mean = 237
S.E. of any marginal mean = 12.02 lb./ac.
S.E. of body of table = 20.82 lb./ac.

---

Crop :- Cotton (Kharif).
Site :- Agri. Res. Sta., Halvod.
Object :- To study the effect of sann green manuring with and without P2O5 and in combination with manure mixture on Cotton.

Ref :- Gj. 54(16).
Type :- 'M'.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) 200 lb./ac. of manure mixture. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 12.6.1956. (iv) (a) 2 ploughings and 1 harrowing. (b) Drilling. (c) 10 lb./ac. 'd', 3' × 3'. (e) N.A. (v) Nil. (vi) Co2=170. (vii) Irrigated. (viii) 6 interculturings. (ix) 33.75'. (x) 25.2.1957 and 10.3.1957.

2. TREATMENTS
   Main-plot treatments:
   Manuring of previous Sannhemp crop: \( M_2 = \text{Sannhemp without } P_2O_5 \) and \( M_4 = \text{Sannhemp with } 16 \text{ lb./ac. of } P_2O_5 \).

   Sub-plot treatments:
   2 levels of manure mixture: \( S_0 = \text{No manure} \) and \( S_1 = 200 \text{ lb./ac. of manure mixture} \). Manure mixture applied to cotton crop.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 51'×18'. (b) 45'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Light attack of jassids and aphids. Spraying with Geigy 1250. (iii) Kapar yield. (iv) (a) 1956–N.A. (modified in 1957). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 469 lb./ac. (ii) (a) 36.43 lb./ac. (b) 43.66 lb./ac. (iii) Only M and S effects are highly significant. (iv) Av. yield of kapar in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( M_0 )</th>
<th>( M_1 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_0 )</td>
<td>333</td>
<td>489</td>
<td>411</td>
</tr>
<tr>
<td>( S_1 )</td>
<td>443</td>
<td>609</td>
<td>526</td>
</tr>
<tr>
<td>Mean</td>
<td>388</td>
<td>549</td>
<td>469</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means =14.87 lb./ac.
2. S marginal means =17.82 lb./ac.
3. S means at the same level of M =25.21 lb./ac.
4. M means at the same level of S =23.21 lb./ac.

Crop :- Cotton (Kharif).

Object :- To study the effect of Sann G.M. on Cotton with and without N and \( P_2O_5 \).

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sann for G.M. and fallow. (c) 16 lb./ac. of \( P_2O_5 \) to one plot of Sann. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 3.7.1957. (iv) (a) Ploughings and harrowings. (b) to (c) N.A. (v) Nil. (vi) Co2=170. (vii) Irrigated. (viii) 4 interculturings and 2 weedings. (ix) 15.09'. (x) 2.1.1958 and 27.1.1958.

2. TREATMENTS:
   1. Cotton after fallow.
   2. Cotton after fallow + 16 lb./ac. of \( P_2O_5 \).
   3. Cotton after fallow + Sann G.M.
   4. Cotton after Sann G.M. + 16 lb./ac. of N.
   5. Cotton after Sann + 16 lb./ac. of \( P_2O_5 \).
   6. Cotton after Sann with 16 lb./ac. of N + Green manuring + 16 lb./ac. of \( P_2O_5 \).

3. DESIGN
   (i) R.B.D (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) 51'×15'. (b) 45'×9'. (v) 3'×3'. (vi) Yes.
4. GENERAL:
(i) Satisfactory growth. (ii) Slight attack of red leaf and black arm disease, very light attack of aphids and jassids. One spraying with Endrine. (iii) Seed cotton yield. (iv) (a) 1956—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 358 lb./ac. (ii) 60.83 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of kapas 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>298</td>
<td>321</td>
<td>358</td>
<td>410</td>
<td>349</td>
<td>412</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=27.20 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).

Object :-To study the economics of hot weather Sann G.M. with and without P₂O₅ on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Legume—Cereal—Cotton. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) N.A. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) 5 lb./ac. (d) 3'×9". (e)—. (v) Nil. (vi) Co₂—170. (vii) Irrigated. (viii) 3 interculturings and 2 weedings. (ix) 13". (x) 30.1.1959.

2. TREATMENTS:
1. Control (no sann, no manure).
2. Cotton manured with 16 lb./ac. of N.
3. Sann G.M. to cotton.
4. Sann as G.M.+16 lb./ac. of N to cotton.
5. Sann as G.M.+16 lb./ac. of P₂O₅ to cotton.
6. Sann as G.M.+16 lb./ac. of P₂O₅+16 lb./ac. of N to cotton.

Source of N and P, amount of G.M. and method of application—N.A.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 12'×40'. (b) 6'×34' (v) 3'×3' (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Kapas yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 604 lb./ac. (ii) 92.67 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>501</td>
<td>495</td>
<td>541</td>
<td>748</td>
<td>643</td>
<td>733</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=46.33 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).

Object :-To study the economics of hot weather G.M. with and without P₂O₅ on yield of Cotton crop.

1. BASAL CONDITIONS:
(i) (a) Legume—Cereal—Cotton. (b) Tur (before sowing of Sann). (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 4.7.1959. (b) (a) 2 ploughings and 1 harrowing. (b) Drilling. (c) 8—10 lb./ac. (d) 3'×18". (e)—. (v) Nil. (vi) Co₂—170. (vii) Irrigated. (viii) 5 interculturings and 3 weedings. (ix) 34". (x) 7.3.1960.
2. TREATMENTS:
Same as in expt. no. 58(29) on page 267.

3. DESIGN:
(i) R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 5.  (iv) (a) 40’X12’.  (b) 34’X9’.  (v) 3’X3’.  (vi) Yes.

4. GENERAL:
(i) Normal.  (ii) Slight attack of grass hopper, shoot borers, aphids and jassids.  (iii) Kapas yield.  (iv) (a) 1956—contd.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 372 lb./ac.  (ii) 67.58 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of kapas 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>336</td>
<td>402</td>
<td>243</td>
<td>348</td>
<td>429</td>
<td>476</td>
</tr>
<tr>
<td>S.E., mean</td>
<td>30.22 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Object :-To study the comparative effect of Sann and Guwar green manuring on yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Legume—Cereal—Cotton.  (b) Groundnut.  (c) Nil.  (ii) (a) Medium black.  (b) Re:-er soil analysis, Halvad.  (iii) 4.7.1959.  (iv) (a) 1 ploughing and 2 harrowings.  (b) Drilling.  (c) 10 lb./ac.—cotton 40 lb. ac.—sann and guwar.  (d) As per treatments.  (e) N.A.  (f) Nil.  (g) Co2—170.  (h) Irrigated.  (i) 5 intercultrings and 3 weedings.  (j) 34”.  (k) 11.2.1960.

2. TREATMENTS:
(1) Cotton alone with 3’ spacing.
(2) Cotton alone with 4.5’ spacing.
(3) Cotton with 3’ spacing and 2 rows of sann.
(4) Cotton with 4.5’ spacing and 3 rows of sann.
(5) Cotton with 3’ spacing and 2 rows of guwar.
(6) Cotton with 4.5’ spacing and 3 rows of guwar.
Amount of G.N.—N.A.

3. DESIGN:
(i) R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 4.  (iv) (a) 40’X18’.  (b) 34’X9’.  (v) 3’X4.5’.  (vi) Ye

4. GENERAL:
(i) Good.  (ii) Slight attack of grass hoppers, flies, aphids and jassids.  (iii) Kapas yield.  (iv) (a) 1959—contd.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 640 lb./ac.  (ii) 72.03 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of kapas 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>660</td>
<td>605</td>
<td>673</td>
<td>618</td>
<td>625</td>
<td>656</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>36.01 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Object :-To find out the optimum dose of N, P and K for Cotton.

Ref :- Gj. 59(17).
Type :- ‘M’.

Ref :- Gj. 55(101).
Type :- ‘M’.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A.  (ii) (a) Medium black. (b) N.A.  (iii) 1.8.1955.  (iv) (a) N.A.  (b) Dibbling.  (c) 5 lb/ac.  (d) 3' x 1.5'. (e) N.A.  (v) Sann G.M.  (vi) Co<sub>2</sub>-170. (vii) Irrigated. (viii) 6 interculturings and 1 weeding. (ix) 12.29'. (x) 8.2.1956 and 9.4.1956.

2. TREATMENTS:
   1. 20 lb/ac. of N.
   2. 40 lb/ac. of N.
   3. 20 lb/ac. of N + 20 lb/ac. of P<sub>2</sub>O<sub>5</sub>.
   4. 40 lb/ac. of N + 20 lb/ac. of P<sub>2</sub>O<sub>5</sub>.
   5. 40 lb/ac. of N + 20 lb/ac. of P<sub>2</sub>O<sub>5</sub> + 40 lb/ac. of K<sub>2</sub>O.
   6. Control (no manure).

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

4. GENERAL:
   (i) Normal. (ii) Attack of jassids and boll worms. (iii) Kapas yield. (iv) (a) to (c) N.A.  (v) (a) and (b) N.A.  (vi) Nil.  (vii) Plot-wise yield N.A.

5. RESULTS:
   (i) 404 lb/ac. (ii) N.A.  (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>466</td>
<td>N.A.</td>
</tr>
</tbody>
</table>
Crop :- Cotton (Kharif).


Ref :- Gj. 58(53).

Type :- 'M'.

Object :- To study the role of organic manures and fertilizers in crop production and maintenance of soil fertility.

1. BASAL CONDITIONS:

(i, a) No. (b) Jowar. (c) Nil.

(ii) (a) Deep black cotton soil. (b) Refer soil analysis, Surat.


(iv) (a) Dibbling. (c) 4 to 5 lb. ac. (d) 5' x 2'. (e) 5 to 6 seeds/dibble.


(ix) 44.81'. (x) 3.4.1959.

2. TREATMENTS:

1. Control.

2. 5 C.L. ac. of F.Y.M., usual dosage.

3. 21 C.L. ac. of F.Y.M.

4. N, P, K fertilizers equivalent to 5 C.L. ac. of F.Y.M.

5. N, P, K fertilizers equivalent to 21 C.L. ac. of F.Y.M.

6. 5 C.L. ac. of F.Y.M. + N, P, K fertilizers equivalent to 5 C.L. ac. of F.Y.M.

7. 21 C.L. ac. of F.Y.M. + N, P, K fertilizers equivalent to 21 C.L. ac. of F.Y.M.

8. 40 lb./ac. of N + 20 lb./ac. of P. P.O.3 + N, P, K fertilizers equivalent to 5 C.L. ac. of F.Y.M.

9. Half the dose in treatment 8.

3. DESIGN:

1. R.B.D.

2. N.A.

3. 36' x 25'.

4. 24' x 15'.

5. 6' x 5'.

6. Yes.

4. GENERAL:

1. Germination was satisfactory but due to continuous rains and heavy floods, the stand of crop was uneven. Gapfilling was not successful due to continuous rains thereafter.


3. Seed cotton yield.

4. Av. yield of kapas in lb. ac.

Treatment 1 2 3 4 5 6 7 8 9
Av. yield 419 460 416 601 462 603 562 664 571
S.E./mean = 37.64 lb./ac.

Crop :- Cotton (Kharif).


Ref :- Gj. 59(31).

Type :- 'M'.

Object :- To study the role of organic manures and fertilizers in crop production and maintenance of soil fertility.

1. BASAL CONDITIONS:

(i, a) Cotton-Jowar. (b) Jowar. (c) Nil.

(ii) (a) Black cotton soil. (b) Refer soil analysis, Surat.


(iv) (a) Dibbling. (c) 4 to 5 lb. ac. (d) 5' x 2'. (e) 5 to 6 seeds/dibble.

(v) Nil.

(vi) 2087. (vii) Unirrigated. (viii) 8 interculturings and 3 weedings.

(ix) 70.77'. (x) 9.4.1960.

2. TREATMENTS:

Same as in exp. no. 58(31) above.


3. DESIGN:

1. R.B.D.

2. N.A.

3. 108' x 75'.

4. (a) 108' x 75'. (b) 24' x 15'. (v) 6' x 5'.

5. Yes.

4. GENERAL:

1. Germination was satisfactory but due to continuous rains and heavy floods, the stand of crop was uneven. Gapfilling was not successful due to continuous rains thereafter.


3. Seed cotton yield.

4. Av. yield of kapas in lb. ac.
5. RESULTS:
   (i) 578 lb./ac.  (ii) 148.2 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of kapas 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>Av. yield</td>
<td>402</td>
<td>391</td>
<td>399</td>
<td>830</td>
<td>633</td>
<td>681</td>
<td>498</td>
<td>744</td>
<td>623</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-74.10 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

_Crop:_ Cotton (Kharif).
_Site:_ Agri. Res. Stn., Surat.
_Type:_ 'M'.

Object: To study the effect of burning Jowar stubbles on the growth and yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Jowar.  (c) Nil.  (ii) (a) Black cotton soil.  (b) Refer soil analysis, Surat.  (iii) 23.6.1958.
   (iv) (a) Nil.  (b) Dibbling.  (c) 4-5 lb./ac.  (d) 5'×2'.  (e) 5-6 seeds/dibble.  (v) Nil.  (vi) 2087 (Vija/pa).  (vii) Unirrigated.  (viii) 5 interculturings and 3 weedings.  (ix) 44.81".  (x) 3.4.1959.

2. TREATMENTS:
   1. Control.
   2. Burning of Jowar stubbles in cotton fields at the rate of 380 lb./ac. of stubbles/plot.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 2.  (b) 36'×50'.  (iii) 12.  (iv) (a) 36'×25'.  (b) 24'×15'.  (v) 6'×5'.  (vi) Yes.

4. GENERAL:
   (i) Normal.  (ii) Boll-worm attack about 15%.  (iii) Seed cotton yield.  (iv) (a) 1958—contd.  (b) and (c) Nil.  (v) (a) N.A.  (b) Nil.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 369.5 lb./ac.  (ii) 51.09 lb./ac.  (iii) Treatment difference is not significant.  (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>353</td>
<td>386</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-14.75 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

_Crop:_ Cotton (Kharif).
_Site:_ Agri. Res. Stn., Surat.
_Type:_ 'M'.

Object: To study the effect of burning Jowar stubbles on the growth and yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Cotton.  (c) 20 lb./ac. of N as A/S.  (ii) (a) Black cotton soil.  (b) Refer soil analysis, Surat.  (iii) 26.6.1959.
   (iv) (a) Nil.  (b) Dibbling.  (c) 4-5 lb./ac.  (d) 5'×2'.  (e) 5-6 seeds/dibble.  (v) 5 C.L./ac. of F.Y.M.  (vi) 2087 (Vija/pa).  (vii) Unirrigated.  (viii) 5 interculturings and 5 weedings.  (ix) 70.77".  (x) 9.4.1960.

2. TREATMENTS:
   Same as in expt. no. 58(55) above.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 2.  (b) 36'×50'.  (iii) 12.  (iv) (a) 36'×25'.  (b) 24'×15'.  (v) 6'×5'.  (vi) Yes.

4. GENERAL:
   (i) Normal.  (ii) Attack of boll-worms.  (iii) Seed cotton yield.  (iv) (a) 1958—contd.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.
5. RESULTS:
(i) 344.5 lb/ac. (ii) 54.72 lb/ac. (iii) Treatment differences is not significant. (iv) Av. yield of kapas in lb/ac.

Treatment 1 2
Av. yield 333 356
S E/mean =15.80 lb/ac.

Crop :- Cotton.

Object:—To investigate the stability effect of N and its availability to Cotton in the soil.

1. BASAL CONDITIONS:
(i) (a) Cotton after Jawar. (b) Jawar. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 24.6.1954. (iv) (a) 3 harrowings. (b) Dibbling. (c) 3 lb/ac. (d) 6'x2'. (e) 4 to 5 seeds, dibble. (v) Nil. (vi) 2037 (Vij)pa, medium. (vii) Unirrigated. (viii) 2 weedings, 2 thinnings and 5 interculturings.

2. TREATMENTS:
All combinations of (1) and (2)
1. 3 doses of A/S: S0=0, S1=224, S2=448 lb/ac.
2. 3 doses of cellulose matter: C0=0, C1=2 and C2=5 ton/ac.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) 42'x30'. (v) 30'x18'. (vi) 6'x6'. (vi) Yes.

4. GENERAL:
(i) Growth was below normal particularly in A/S plots. (ii) Nil. (iii) Periodical height, number and weight of green cotton stalks were taken. (iv) (a) 1952-1956. (b) In alternate years two sets of plots were assigned to the expt. (c) No. (v) (a) Amreli. (b) N.A. (vi) Season was very abnormal. (vii) Nil.

5. RESULTS:
(i) 601 lb/ac. (ii) 62.91 lb/ac. (iii) Treatment differences are significant. (iv) yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0</td>
<td>526</td>
<td>554</td>
<td>513</td>
<td>531</td>
</tr>
<tr>
<td>S1</td>
<td>615</td>
<td>598</td>
<td>618</td>
<td>610</td>
</tr>
<tr>
<td>S2</td>
<td>742</td>
<td>663</td>
<td>585</td>
<td>663</td>
</tr>
<tr>
<td>Mean</td>
<td>628</td>
<td>605</td>
<td>572</td>
<td>601</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean =14.83 lb/ac.
S.E. of body of table =25.68 lb/ac.

Crop :- Cotton.

Object:—To investigate the stabilising effect of N and its availability to Cotton in the soil.

1. BASAL CONDITIONS:
(i) (a) Cotton—Jawar. (b) Jawar B.P. 53. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 22.6.1955. (iv) (a) N.A. (b) Dibbling. (c) 2 to 3 lb/ac. (d) 6'x2'. (e) N.A. (f) Nil. (vi) Vijay. (vii) Unirrigated. (viii) 2 thinings, 3 weedings and 6 interculturings. (ix) 27'. (x) 5.3.1956 to 24.3.1956.
2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 54(69) on page 272.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Seed cotton yield. (iv) (a) 1952—N.A. (b) Yes (in alternate years). (c) No. (v) (a) Amreli. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 800 lb./ac. (ii) 106.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C₀</th>
<th>C₁</th>
<th>C₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₀</td>
<td>521</td>
<td>556</td>
<td>588</td>
<td>555</td>
</tr>
<tr>
<td>S₁</td>
<td>801</td>
<td>820</td>
<td>747</td>
<td>789</td>
</tr>
<tr>
<td>S₂</td>
<td>1228</td>
<td>973</td>
<td>969</td>
<td>1057</td>
</tr>
<tr>
<td>Mean</td>
<td>850</td>
<td>783</td>
<td>768</td>
<td>800</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 25.06 lb./ac.
S.E. of body of table = 43.39 lb./ac.

Crop: Cotton.
Object: To see the effect of different nitrogenous fertilizers on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar. (b) Jowar—Tur. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat.
   (iii) 20.6.1956. (iv) (a) N.A. (b) Hand dibbling. (c) 4 to 5 lb./ac. (d) 5'×2'. (e) N.A. (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P₂O₅ as Super.
   (vi) Cotton—2087. (vii) Unirrigated. (viii) 2 thinnings, 1 weeding, 5 interculturings and 1 gap filling. (ix) 41.74". (x) 2.3.1957 and 1.4.1957.

2. TREATMENTS:
   1. 40 lb./ac. of N as A/S.
   2. 40 lb./ac. of N as Urea.
   3. 40 lb./ac. of N as calcium cyanamide.
   4. 20 lb./ac. of P₂O₅ as hyper phos.
   5. 40 lb./ac. of N as A/S/N.
   6. Control.

All nitrogenous fertilizers except calcium cyanamide applied at the time of sowing, calcium cyanamide applied in dry condition about 15 days before sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 42'×30'; (b) 30'×20'; (v) 6'×5'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Heavy attack of boll-worm. (iii) Seed cotton yield. (iv) (a) 1956—N.A. (b) and (c) No.
   (v) (a) Amreli. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 426 lb./ac. (ii) 60.81 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of kapas 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>444</td>
<td>337</td>
<td>549</td>
<td>459</td>
<td>436</td>
<td>330</td>
</tr>
</tbody>
</table>

S.E./mean = 30.40 lb./ac.
Crop :- Cotton (Kharif).

Ref :- Gj. 57(69).
Type :- 'M'.

Object :- To study the effect of different nitrogenous fertilizers on the yield of Cotton.

1. BASAL CONDITIONS :
   (i) (a) Jowar after cotton. (b) Jowar. (c) Nil. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Surat. (iii) 6.7.1957, re-dibbling on 17.7.1957 and 20.7.1957. (iv) (a) N.A. (b) Dibbling. (c) 4 to 5 lb./ac. (d) 5'x2'. (e) 5 to 6 seeds dibble. (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P₂O₅ as Super. (vi) Cotton—266. (vii) Irrigated. (viii) 3 interculturings, 4 weedings and 1 thinning. (ix) 25.3.1958 and 3.4.1958.

2. TREATMENTS:
   5 sources of 40 lb./ac. of N and a control : S₀=0, S₁=Urea, S₂=Calcium nitrate, S₃=Calcium cyanamide and S₄=A/S/N.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 42'x30'. (b) 30'x20'. (v) 6'x5'. (vi) Yes.

4. GENERAL :
   (i) Growth reached a height of 50' to 70'. (ii) Pink boll-worm and drying of bolls before maturing were about 15~%. No disease. (iii) Wt. of seed cotton. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 153 lb./ac. (ii) 44.81 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>440</td>
<td>489</td>
<td>441</td>
<td>411</td>
<td>486</td>
<td></td>
</tr>
</tbody>
</table>
   | S.E./mean |    |    |    |    |    | 34.20 lb./ac.

Crop :- Cotton (Kharif).

Ref :- Gj. 58(51).
Type :- 'M'.

Object :- To study the effect of different nitrogenous fertilizers on the yield of Cotton.

1. BASAL CONDITIONS :
   (i) (a) Cotton after Jowar and Tur. (b) Jowar and Tur. (c) Nil. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Surat. (iii) 22.6.1958. (iv) (a) N.A. (b) Dibbling. (c) 4 to 5 lb./ac. (d) 5'x2'. (e) 5 to 6 seeds dibble. (v) 5 C.L./ac. of F.Y.M.+20 lb./ac. of P₂O₅ as Super. (vi) Cotton—2087. (vii) Unirrigated. (viii) 4 interculturings, 4 weedings and 1 thinning. (ix) 44.81'. (x) 4.4.1959.

2. TREATMENTS:
   Same as in exp. no. 57(69) above.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 42'x30'. (b) 30'x20'. (v) 6'x5'. (vi) Yes.

4. GENERAL :
   (i) Growth of cotton reached a height of 98 to 119 cms. (ii) Boll-worm attack was observed about 15 to 20%. (iii) Yield of seed cotton. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 535 lb./ac. (ii) 68.94 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>440</td>
<td>522</td>
<td>531</td>
<td>640</td>
<td>540</td>
<td>544</td>
</tr>
</tbody>
</table>
   | S.E./me. n|    |    |    |    |    | 34.47 lb./ac.
Crop :- Cotton.  

Ref :- Gj. 56(63).  
Type :- ‘M’.

Object :- To study the effect of \( P_2O_5 \) on the yield of Cotton.

1. BASAL CONDITIONS :
   (i) (a) Cotton—Jowar+Tur.  (b) Jowar+Tur.  (c) Nil.  
   (ii) (a) Black cotton soil.  (b) Refer soil analysis, Surat.  
   (iii) 20.6.1956.  (iv) (a) and (b) N.A.  
   (c) 4 to 5 lb./ac. of F.Y.M.+40 lb./ac. of N as \( A/S \).  
   (v) 5 C.L./ac. of F.Y.M.+40 lb./ac. of N as \( A/S \).  
   (viii) 2 thinnings, 1 weeding and 5 interculturings.  
   (ix) 41.74”.  

2. TREATMENTS :
   5 sources of 20 lb./ac. of \( P_2O_5 \) and a control:  
   \( S_0 = 0, \ S_1 = \text{Super}, \ S_2 = \text{B.M.}, \ S_3 = \text{Dicalcium phos.}, \ S_4 = \text{Hyper phos.} \) and \( S_5 = \text{Kotka phosphate}. \)  
   Phosphates drilled before sowing in the field.

3. DESIGN :
   (i) R.B.D.  
   (ii) (a) 6.  (b) N.A.  (iii) 4.  
   (iv) (a) 42’x30’.  (b) 30’x20’.  (v) 6’x5’.  
   (vi) Yes.

4. GENERAL :
   (i) Good.  
   (ii) Heavy attack of boll-worm.  
   (iii) Seed cotton yield.  
   (iv) (a) 1956—contd.  (b) No.  (c) Nil.  
   (v) (a) Amreli.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 618 lb./ac.  
   (ii) 121.8 lb./ac.  (iii) Treatment differences are not significant.  
   (iv) Av. yield of kapas in lb./ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( S_0 )</th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( S_4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>676</td>
<td>596</td>
<td>710</td>
<td>624</td>
<td>518</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60.90 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).  

Ref :- Gj. 57(70).  
Type :- ‘M’.

Object :- To study the effect of \( P_2O_5 \) on the yield of Cotton.

1. BASAL CONDITIONS :
   (i) (a) N.A.  (b) Jowar+Tur.  (c) Nil.  
   (ii) (a) Deep black cotton soil.  (b) Refer soil analysis, Surat.  
   (iii) 6.7.1957, re-dibbling on 17.7.1957.  
   (iv) (a) N.A.  (b) Dibbling.  
   (c) 4 to 5 lb./ac.  (d) 5’x2’.  
   (e) 5 to 6 seedlings.  
   (v) 5 C.L./ac. of F.Y.M.+40 lb./ac. of N as \( A/S \).  
   (vi) Cotton—2087.  (vii) Irrigated.  
   (viii) 3 interculturings, 2 weedings and 1 thinning.  
   (ix) 23.41”.  

2. TREATMENTS (i) 3.  
   DESIGN :
   Same as in expt. no. 56(63) above.

4. GENERAL :
   (i) Growth generally even.  
   (ii) Pink boll-worm and drying of bolls before maturing in the 1st setting of 
   bolls in November.  
   (iii) Weight of seed cotton.  
   (iv) (a) 1956—contd.  (b) No.  (c) Nil.  
   (v) (a) Amreli.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 507 lb./ac.  
   (ii) 59.60 lb./ac.  (iii) Treatment differences are not significant.  
   (iv) Av. yield of kapas in lb./ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( S_0 )</th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( S_4 )</th>
<th>( S_5 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>484</td>
<td>490</td>
<td>504</td>
<td>518</td>
<td>495</td>
<td>549</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>29.80 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>
Crop: Cotton (Kharif).

Object: To study the effect of \( P_2O_5 \) on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Jowar after cotton. (b) Jowar+Tur. (c) Nil. (ii) (a) Deep black cotton soil. (b) Refer soil analysis, Surat. (iii) 22.6.1958. (iv) (a) N.A. (b) Dibbling. (c) 4 to 5 lb./ac. (d) 5"x2'. (e) 5 to 6 seeds per dibble. (v) 5 C.L./ac. of F.Y.M.+40 lb./ac. of N as A/S. (vi) 2087 (Vijalpa). (vii) Unirrigated. (viii) 3 interculturings, 4 weedings and 1 thinnning. (ix) 44.81'. (x) 4.4.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 56(63) on page 275.

4. GENERAL:
   (i) Growth in all the plots was generally even. The season was rather late this year. (ii) Boll-worm attack was observed about 16% in all the treatments. (iii) Yield of seed cotton. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 486 lb./ac. (ii) 47.54 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S0</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>504</td>
<td>454</td>
<td>522</td>
<td>467</td>
<td>472</td>
<td>499</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23.77 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop: Cotton (Kharif).
Site: M.A.E. Farm, Umrula.

Object: Type V—To study the effect of different sources of N applied at different times.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Medium black soil of trap and gneissic origin. (b) N.A. (iii) July 1956. (iv) 'a) 2 ploughings with country plough and 2 harrowings. (b) Drilling. (c) 20 lb./ac. 'd) 18"x12'. (e) N.A. (v) 20 lb./ac. of \( P_2O_5 \) and 5,000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) One interculturing and one weeding. (ix) N.A. (x) December 1956.

2. TREATMENTS:
   All combinations of (1) and (2)+a control (no manure).
   (1) 2 sources of 50 lb./ac. of N : \( S_1 = A/S \) and \( S_2 = Urea \).
   (2) 6 times of application of N : \( T_1 = \text{At sowing}, T_2 = \text{At thinning}, T_3 = \text{At flowering}, T_4 = \text{At thinning} + \text{at flowering}, T_5 = \text{At sowing} + \text{at thinning} + \text{at flowering}, T_6 = \text{At thinning} + \text{at flowering} \) one month after flowering.

3. DESIGN:
   (i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 24'x12'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) N.A. (iii) Cotton yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) Yes. (vi) to (vii) Nil.

5. RESULTS:
   (i) 534 lb./ac. (ii) 108.8 lb./ac. (iii) Only the effect of control vs. others is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control =444 lb./ac.</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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>568</td>
<td>699</td>
<td>518</td>
<td>502</td>
<td>453</td>
<td>576</td>
<td>553</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>592</td>
<td>403</td>
<td>502</td>
<td>576</td>
<td>667</td>
<td>444</td>
<td>531</td>
</tr>
<tr>
<td>Mean</td>
<td>580</td>
<td>551</td>
<td>510</td>
<td>539</td>
<td>560</td>
<td>510</td>
<td>542</td>
</tr>
</tbody>
</table>
Ref: Gj. 57(MAE).

Crop: Cotton (Kharif).

Site: M.A.E. Farm, Umrala.

Type: ‘M’.

Object: Type V—To study the effect of different sources of N applied at different times.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Medium black soil of trap and gneissic origin. (b) N.A. (iii) 3.7.1957. (iv) (a) 2 ploughings with country plough and two harrowings. (b) Drilling. (c) 20 lb./ac. (d) 18”x12”. (e) N.A. (v) 20 lb./ac. of P₂O₅ and 5,000 lb./ac. of F.Y.M. (vi) Pratap (171 days). (vii) Irrigated. (viii) One interculturing and one weeding. (ix) 23”. (x) 21.12.1957.

2. TREATMENTS to 3. DESIGN:
   Same as in expt. no. 56(MAE) on cotton crop on page 276.

4. GENERAL:
   (i) Satisfactory. (ii) Crop attacked by aphids and jassids. (iii) Cotton yield. (iv) (a) 1956—contd. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1000 lb./ac. (ii) 123.8 lb./ac. (iii) Only the effect of control vs others is significant. (iv) Av. yield of cotton in lb./ac.

Control = 852 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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
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<td>840</td>
<td>975</td>
<td>1179</td>
<td>993</td>
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<td>S₂</td>
<td>1039</td>
<td>1114</td>
<td>934</td>
<td>985</td>
<td>1084</td>
<td>1040</td>
<td>1033</td>
</tr>
<tr>
<td>Mean</td>
<td>953</td>
<td>989</td>
<td>1012</td>
<td>969</td>
<td>1131</td>
<td>1016</td>
<td>1012</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of T = 50.5 lb./ac.
S.E. of marginal mean of S = 29.2 lb./ac.
S.E. of body of table or control mean = 71.5 lb./ac.

Ref: Gj. 58(MAE).

Crop: Cotton.

Site: M.A.E. Farm, Umrala.

Type: ‘M’.

Object: Type V—To study the effect of different sources of N applied at different times.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Medium black soil of trap and gneissic origin. (b) N.A. (iii) N.A. (iv) (a) Country ploughing and harrowing. (b) Drilling. (c) 20 lb./ac. (d) 18”x12”. (e) N.A. (v) 20 lb./ac. of P₂O₅ and 5,000 lb./ac. of F.Y.M. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 56(MAE) on cotton crop on page 276.

5. RESULTS:
   (i) 853 lb./ac. (ii) 138.4 lb./ac. (iii) Only the effect of control vs others is significant. (iv) Av. yield of cotton in lb./ac.
Crop :- Cotton.  
Site :- M.A.E. Farm, Umrala.  
Ref :- Gj. 59(MAE).  
Type :- 'M'.

Object :- Type V—To study the effect of different sources of N applied at different times.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Medium black soil of trap and gneissic origin.  (b) N.A.  (iv) (a) Country ploughing and harrowing.  (b) Drilling.  (c) 20 lb./ac.  (d) 18' × 12'.  (e) N.A.  (v) 20 lb./ac. of P₂O₅ and 5,000 lb./ac. of F.Y.M.  (vi) N.A.  (vii) Irrigated.  (viii) to (x) N.A.

2. TREATMENTS to 4. GENERAL:
   Same as in expt. no. 56(MAE), on page 276.

5. RESULTS:
   (i) 277 lb./ac.  (ii) 120.8 lb./ac.  (iii) None of the effects is significant.  (iv) Av. yield of cotton in lb./ac.

Control = 303 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>Mean</th>
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</thead>
<tbody>
<tr>
<td>S₁</td>
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<td>253</td>
<td>152</td>
<td>372</td>
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<td>448</td>
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<td>S₂</td>
<td>354</td>
<td>322</td>
<td>236</td>
<td>217</td>
<td>221</td>
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<td>269</td>
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<tr>
<td>Mean</td>
<td>347</td>
<td>287</td>
<td>194</td>
<td>294</td>
<td>170</td>
<td>356</td>
<td>275</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of T = 49.3 lb./ac.
S.E. of marginal mean of S = 28.5 lb./ac.
S.E. of body of table or control mean = 69.7 lb./ac.

Crop :- Cotton.  
Site :- M.A.E., Farm, Umrala.  
Ref :- Gj. 57(MAE).  
Type :- 'M'.

Object :- Type II—To study long term effects of three levels of N, P, K and 2 levels of bulky manure on fixed two or three course rotation.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Cotton—Jowar.  (b) Wheat.  (c) As per treatments.  (ii) (a) Medium black.  (b) N.A.  (iii) July 1957.  (iv) (a) 1 ploughing and 2 harrowings.  (b) Drilling.  (c) 10 lb./ac.  (d) 3' between rows.  (e) N.A.  (v) Nil.  (vi) C.J.—73 (early).  (vii) Unirrigated.  (viii) No.  (ix) N.A.  (x) December 1957.
2. TREATMENTS:

All combinations of (1), (2), (3) and (4)
(1) 2 levels of F.Y.M.: F₀ = 0 and F₁ = 5000 lb./ac.
(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 = 30 and P₂ = 60 lb./ac.
(4) 3 levels of K₂O as Mur. of potash: K₀ = 0, K₁ = 30 and K₂ = 60 lb./ac.

3. DESIGN:

(i) 3³ x 2 confd. (ii) (a) 6 blocks/replication; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 24' x 12'.
(v) N.A.  (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Kapas yield. (iv) (a) 1956—contd. (b) Yes. (c) No. (v) N.A. (vi) Nil. (vii) Experiment not laid out according to plan in 1956.

5. RESULTS:

(i) 906 lb./ac. (ii) 132.6 lb./ac. (iii) Only N effect is highly significant. (iv) Av. yield of cotton in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
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<td>F₀</td>
<td>997</td>
<td>930</td>
<td>814</td>
<td>863</td>
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<td>933</td>
<td>926</td>
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<td>F₁</td>
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<td>973</td>
<td>802</td>
<td>877</td>
<td>882</td>
<td>933</td>
<td>933</td>
<td>856</td>
<td>903</td>
<td>897</td>
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<td>771</td>
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<td>935</td>
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<tr>
<td>P₀</td>
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<td>P₁</td>
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<td>P₂</td>
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<td>920</td>
<td>830</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

S.E. of N, P or K marginal mean = 31.3 lb./ac.
S.E. of F marginal mean = 25.5 lb./ac.
S.E. of body of N x P, N x K on P x K table = 54.1 lb./ac.
S.E. of body of F x N, F x K on F x P table = 44.2 lb./ac.

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Crop :- Cotton.  
Site :- M.A.E. Farm, Umrala.  
Object :- Type II—To study the long term effects of three levels of N, P, K and 2 levels of bulky manure on fixed two or three course rotation.

1. BASAL CONDITIONS:

(i) (a) Wheat—Cotton—Jowar. (b) Wheat. (c) As per treatments. (ii) (a) Medium black. (b) N.A. (iii) 5.7.1959. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 10 lb./ac. (d) 3' between rows. (e) —. (v) Nil. (vi) C.J.—73 (early). (vii) Unirrigated. (viii) 2 weedings. (ix) 25.98. (x) 10.12.1959.

2. TREATMENTS to 4. GENERAL:

Same as in expvt. no. 57(MAE) on page 278.

5. RESULTS:

(i) 262.4 lb./ac. (ii) 101.9 lb./ac. (iii) Only P effect is highly significant. (iv) Av. yield of cotton in lb./ac.
Object: To find out the response of Cotton under cultivators farming conditions to application of N, P and K.

1. BASAL CONDITIONS:
   (i) (a) and (b) Jowar. (c) Nil. (i) Black soil. (iii) Nil. (iv) Cotton—2087 (improved). (v) (a) Ploughing and harrowing. (b) and (c) N.A. (d) 60"x16". (e) N.A. (vi) From last week of June to 2nd week of July. (vii) Unirrigated. (viii) Weeding. (ix) 56.22'. (x) 1st week of Feb. to 1st week of April.

2. TREATMENTS:
   0 = Control.
   N1 = 20 lb./ac. of N as A/S.
   N2 = 40 lb./ac. of N as A/S.
   N1P = 20 lb./ac. of N as A/S + 20 lb./ac. of P2O5 as Super.
   N2P = 40 lb./ac. of N as A/S + 20 lb./ac. of P2O5 as Super.
   N1PK = 40 lb./ac. of N as A/S + 20 lb./ac. of P2O5 as Super + 40 lb./ac. of K2O as Pot. Sul.
   Super and Pot. Sul. were applied before sowing and A/S was applied 3 weeks after sowing in 2 doses.

3. DESIGN:
   (i) and (ii) Villages were randomly selected and sites in a village were located by randomly selected survey no. Generally 4 villages and 2 sites in each village were taken. (iii) (a) 52'x42'. (b) 36'x30'. (iv) Yes.

4 GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Growth, height, flowering and boll formation etc. (iv) (a) 1954—contd. (b) No. c; Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 335.3 lb./ac. (ii) 98.01 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N1</td>
</tr>
<tr>
<td>0</td>
<td>221.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>33.69 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Cotton (Kharif).

Centre :- Chorasi (c.f.).

Object :- To find the response of Cotton under cultivator's farming conditions to application of N, P and K.

1. BASAL CONDITIONS :
(i) (a) and (b) Jowar. (c) Nil. (ii) Black soil. (iii) Nil. (iv) Cotton—2087 (improved). (v) (a) Ploughing and harrowing. (b) and (c) N.A. (d) 60' x 12". (e) N.A. (vi) From last week of June to 2nd week of July. (vii) Unirrigated. (viii) Weeding. (ix) 27.99". (x) From 2nd week of Feb. to 1st week of April.

2. TREATMENTS :
Same as in expt. no. 55(84) on page 280.

3. DESIGN :
(i) and (ii) The villages were randomly selected and sites in a village were located by a randomly selected survey no. Generally 3 villages and 2 sites in each village are taken. (iii) (a) 52' x 42'. (b) 36' x 30'. (vi) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Growth, height, flowering and boll formation. (iv) (a) 1954—contd. (b) Nil. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 547.6 lb./ac. (ii) 70.18 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of Kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N1</th>
<th>N2</th>
<th>N1P</th>
<th>N2P</th>
<th>N2PK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>291.4</td>
<td>432.1</td>
<td>600.0</td>
<td>463.3</td>
<td>691.3</td>
<td>807.7</td>
</tr>
</tbody>
</table>

S.E./mean = 31.46 lb./ac.

Crop :- Cotton (Kharif).

Centre :- Kamrej (c.f.).

Ref :- Gj. 55(81).

Type :- 'M'.

Object :- To find out the response of Cotton under cultivators' farming conditions to applications of N, P and K.

1. BASAL CONDITIONS :
(i) (a) and (b) Jowar. (c) 20 to 25 C.L./ac. of F.Y.M. (ii) Morram. (iii) Nil. (iv) Cotton—2087. (v) (a) Ploughing and harrowing. (b) and (c) N.A. (d) 72" x 15" to 18". (e) N.A. (vi) From last week of June to 2nd week of July. (vii) Unirrigated. (viii) Weeding. (ix) 49.60". (x) From 1st week of Feb. to 1st week of April.

2. TREATMENTS :
Same as in expt. no. 55(88) on page 280.

3. DESIGN :
(i) and (ii) The villages were selected randomly and sites in a village were located by randomly selected survey no. Generally 4 villages and 2 sites in each village are taken. (iii) (a) 52' x 42'. (b) 36' x 30'. (iv) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Growth, height, flowering, boll formation etc. (iv) (a) 54—contd. (b) Nil. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 478.3 lb./ac. (ii) 94.00 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of Kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N1</th>
<th>N2</th>
<th>N1P</th>
<th>N2P</th>
<th>N2PK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>483.7</td>
<td>488.1</td>
<td>493.2</td>
<td>492.5</td>
<td>478.0</td>
<td>434.3</td>
</tr>
</tbody>
</table>

S.E./mean = 33.07 lb./ac.
Object:—To find out the response of Cotton under cultivators' farming conditions to application of N, P and K.

1. BASAL CONDITIONS:
   (i) (a) and (b) Jowar. (c) Nil. (ii) Medium black. (iii) Nil. (iv) Cotton—2087 (improved). (v) (a) Ploughing and harrowing. (b) and (c) N.A. (d) Varies from 12' x 42'' to 12' x 70''. (e) N.A. (vi) From last week of June to 2nd week of July. (vii) Unirrigated. (viii) Weeding. (ix) 59.94''. (x) From 2nd week of Feb. to 1st week of Apr.

2. TREATMENTS:
   Same as in expt. no. 55(82); on page 280.

3. DESIGN:
   (i) and (ii) The villages were randomly selected and the sites in a village were located by randomly selected survey no. Generally 6 villages and 2 sites in each village are taken. (iii) (a) 52' x 41'. (b) 36' x 30'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Growth, height, flowering and boll formation. (iv) (a) 1954—contd. (b) N P (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 319.0 lb./ac. (ii) 65.74 lb./ac. (iii) Treatments do not differ significantly. (vi) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₁P</th>
<th>N₂P</th>
<th>N₁PK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>290.6</td>
<td>305.0</td>
<td>292.5</td>
<td>320.3</td>
<td>341.6</td>
<td>364.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 32.87 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Crop:—Cotton (Kharif) Ref:—Gj. 55(86).
Centre:—Mahuwa (c.f.). Type:—'M'.

Object:—To find out the response of Cotton under cultivators' farming conditions to application of N, P and K.

1. BASAL CONDITIONS:
   (i) (a) and (b) Jowar. (c) Nil. (ii) Medium black and Goradu. (iii) Nil. (iv) Cotton—2087. (v) (a) Ploughing and harrowing. (b) and (c) Nil. (d) 36' to 60' x 12'' to 18''. (e) Nil. (vi) 3rd week of June to 1st week of July. (vii) Unirrigated. (viii) Weeding. (ix) 54.65''. (x) 2nd week of Feb. to first week of April.

2. TREATMENTS:
   Same as in expt. no. 55(88); on page 280.

3. DESIGN:
   (i) and (ii) Villages were randomly selected and the sites in a village were located by randomly selected survey no. Generally 6 villages and 2 sites in each village are taken. (iii) (a) 52' x 42'. (b) 36' x 30'. (iv) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Growth, height, flowering and boll formation. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 456.8 lb./ac. (ii) 136.7 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.
Crop :- Cotton (Kharif).
Centre :- Mangool (c.f.).

Object :- To find out the response of cotton under cultivators' farming conditions to application of N, P and K.

1. BASAL CONDITIONS :
(i) (a) and (b) Jowar in five villages and Kodra in one village. (c) Nil. (ii) Black. (iii) Nil. (iv) Improved. cotton—2087. (v) (a) Ploughing and harrowing. (b) and (c) N.A. (d) 60° to 84° × 15° to 18°. (e) N.A. (vi) From last week of June to 2nd week of July. (vii) Unirrigated. (viii) Weeding. (ix) 49.01°. (x) From 1st week of Feb. to 1st week of April.

2. TREATMENTS :
Same as in expt. no. 55(88) on page 280.

3. DESIGN :
(i) and (ii) The villages were selected randomly and the sites were located by randomly selected survey no. Generally 6 villages and 2 sites in a village were taken. (iii) (a) 52' × 42'. (b) 36' × 30'. (iv) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Growth, height, flowering and boll-formation. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 49.4 lb./ac. (ii) 40.72 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N1</th>
<th>N2</th>
<th>N1P</th>
<th>N2P</th>
<th>N1PK</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>407.3</td>
<td>482.7</td>
<td>547.1</td>
<td>343.4</td>
<td>552.2</td>
<td>407.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>68.36 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Centre :- Nawsari (c.f.).

Object :- To find out the response of cotton under cultivators' farming conditions to applications of N, P and K.

1. BASAL CONDITIONS :
(i) (a) and (b) Cotton in two villages and Jowar in other. (c) Nil. (ii) Black. (iii) Nil. (iv) Cotton—2087 (improved). (v) (a) Ploughing and harrowing. (b) and (c) N.A. (d) Varies from 50° × 26° to 54° × 24°. (e) N.A. (vi) From last week of June to 2nd week of July. (vii) Unirrigated. (viii) Weeding. (ix) 49.34°. (x) From 2nd week of Feb. to 1st week of April.

2. TREATMENTS :
Same as in expt. no. 55(88) on page 280.

3. DESIGN :
(i) and (ii) Villages were selected randomly and sites in a village were located by randomly selected survey no. No. of villages 4 and number of sites in each village N.A. (iii) (a) 52' × 42'. (b) 36' × 30'. (v) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Growth, height, flowering and boll-formation. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 502.8 lb/ac.  (ii) 88.73 lb/ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N₁</th>
<th>N₂</th>
<th>N₁P</th>
<th>N₂P</th>
<th>N₁PK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>426.4</td>
<td>484.7</td>
<td>558.8</td>
<td>495.4</td>
<td>530.7</td>
<td>521.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>31.46</td>
<td>31.46</td>
<td>31.46</td>
<td>31.46</td>
<td>31.46</td>
<td>31.46</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Centre :- Olpad (c.f.).

Object :-To find out the response of Cotton under cultivators' farming conditions to application of N, P and K.

1. BASAL CONDITIONS:

(i) (a) and (b): Cotton in two villages and Jowar in others.  (c) Nil.  (ii) Black.  (iii) Nil.  (iv) Cotton—2087 (improved).  (v) Ploughing and harrowing.  (vi) From last week of June to 2nd week of July.  (vii) Unirrigated.  (viii) Weeding.  (ix) 25.85".  (x) 1st week of Feb. to 1st week of April.

2. TREATMENTS:

Same as in expt. no. 55(88) on page 280.

3. DESIGN:

(i) and (ii) Villages were randomly selected and sites were located in each village by randomly selected survey nos. Generally 6 villages and 2 sites in each village were taken.  (iii) (a) 52' x 42'.  (b) 36' x 30'.  (iv) Yes.

4. GENERAL:

(i) Satisfactory.  (ii) Nil.  (iii) Growth, height, flowering and boll-formation.  (iv) (a) 1954—contd.

5. RESULTS:

(i) 878.8 lb/ac.  (ii) 156.9 lb/ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N₁</th>
<th>N₂</th>
<th>N₁P</th>
<th>N₂P</th>
<th>N₁PK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>559.3</td>
<td>674.8</td>
<td>1008.1</td>
<td>688.1</td>
<td>1100.4</td>
<td>1222.3</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>45.17</td>
<td>45.17</td>
<td>45.17</td>
<td>45.17</td>
<td>45.17</td>
<td>45.17</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Centre :- Palsana (c.f.).

Object.—To find out the response of Cotton under cultivators' farming conditions to application of N, P and K.

1. BASAL CONDITIONS:

(i) (a) and (b): Jowar.  (c) Nil.  (ii) Black.  (iii) Nil.  (iv) Cotton—2087 (improved).  (v) Ploughing and harrowing.  (vi) From last week of June to 2nd week of July.  (vii) Unirrigated.  (viii) Weeding.  (ix) 47.49".  (x) From 1st week of Feb. to 1st week of April.

2. TREATMENTS:

Same as in expt. no. 55(88) on page 280.

3. DESIGN:

(i) and (ii) The villages were selected randomly. The sites in a village were located by randomly selected survey no. Generally 2 villages and 2 sites in each village were taken.  (iii) (a) 52' x 42'.  (b) 36' x 30'.  (iv) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Growth, height, flowering and boll-formation. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 411.5 lb./ac. (ii) 80.67 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N₁</th>
<th>N₂</th>
<th>N₁P</th>
<th>N₂P</th>
<th>N₁PK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>313.3</td>
<td>371.9</td>
<td>497.3</td>
<td>387.0</td>
<td>466.5</td>
<td>433.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=40.33 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop :- Cotton (Kharif).**  
**Centre :- Songadh (c.f.).**  
**Ref :- Gj. 55(87).**  
**Type :- 'M'.**

Object :-To find out the response of Cotton under cultivators' farming conditions to application of N, P and K.

1. BASAL CONDITIONS:
(i) (a) and (b) Cotton. (c) Nil. (ii) Deep black. (iii) Nil. (iv) Cotton—2087 (improved). (v) (a) Ploughing and harrowing. (b) and (c) N.A. (d) 27" to 36"×12". (e) N.A. (v) 2nd and 3rd week of June. (vi) Unirrigated. (vii) Nil. (ix) 72.14". (x) 1st week of March to 2nd week of April.

2. TREATMENTS:
Same as in exp. no. 55(88) on page 280.

3. DESIGN:
(i) and (ii) Villages were randomly selected. The site in a village was located by randomly selected survey no. Generally 2 villages and 2 sites in each village were taken. (iii) (a) 52′×42′. (b) 36′×30′. (iv) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Growth, height, flowering, boll-formation etc. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 391.2 lb./ac. (ii) 74.62 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N₁</th>
<th>N₂</th>
<th>N₁P</th>
<th>N₂P</th>
<th>N₁PK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>297.0</td>
<td>373.2</td>
<td>431.2</td>
<td>431.1</td>
<td>363.0</td>
<td>451.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=37.31 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop :- Cotton (Kharif).**  
**Centre :- Valod. (c.f.).**  
**Ref :- Gj. 55(79).**  
**Type :- 'M'.**

Object :-To find out the response of Cotton under cultivators' farming conditions to application of N, P and K.

1. BASAL CONDITIONS:
(i) (a) and (b) Cotton. (c) 10 C.L./of F.Y.M./ac. in one village and in others—Nil. (ii) Medium black to loamy. (iv) Cotton—2087. (v) (a) Ploughing and harrowing. (b) and (c) N.A. (d) 60″×18″. (e) N.A. (vi) From last week of June to 2nd week of July. (vii) Unirrigated. (viii) Weeding. (ix) 64.57". (x) From 2nd week of Feb. to 1st week of April.

2. TREATMENTS:
Same as in exp. no. 55(88) on page 280.
3. DESIGN:

(i) and (ii) Villages were selected randomly and sites in a village were located by randomly selected survey nos. Generally 2 villages and 2 sites in each village were taken. (iii) (a) 52°×42°. (b) 36°×30°. (iv) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Growth, height, flowering and boll-formation. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) a, and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 142.5 lb./ac. (ii) 32.27 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N1</th>
<th>N2</th>
<th>N3P</th>
<th>N4P</th>
<th>N5PK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>109.7</td>
<td>121.2</td>
<td>118.6</td>
<td>124.8</td>
<td>194.0</td>
<td>186.5</td>
</tr>
</tbody>
</table>
| S.E., mean=22.59 lb./ac.

---

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

**Centre :- Vyara (c.f.).**

**Ref :- Gj. 55(83).**

**Type :- 'M'.**

Object :-To find out the response for Cotton under cultivators’ farming conditions to application of N, P and K.

1. BASAL CONDITIONS:

(i) (a) and (b) Cotton in two villages and Jowar in one village (c) Nil. (ii) Black. (iii) Nil. (iv) Cotton—2087 (improved). (v) Ploughing and harrowing. (b) and (c) N.A. (d) 60°×12° to 18°. (e) N.A. (vi) From last week of June to 2nd week of July. (vii) Unirrigated. (viii) —. (ix) 75.10°. (x) From 1st week of Feb. to 1st week of April.

2. TREATMENTS:

Same as in exp. no. 55(88) on page 280.

3. DESIGN:

(i) and (ii) The villages were selected randomly and sites in a village were located by randomly selected survey nos. Generally 3 village and 2 sites in each village were taken. (iii) (a) 52°×42°. (b) 36°×30°. (iv) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Growth, height, flowering and boll-formation. (iv) (a) 1954—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 318.6 lb./ac. (ii) 36.30 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>0</th>
<th>N1</th>
<th>N2</th>
<th>N3P</th>
<th>N4P</th>
<th>N5PK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>301.8</td>
<td>282.4</td>
<td>359.8</td>
<td>300.4</td>
<td>331.2</td>
<td>335.8</td>
</tr>
</tbody>
</table>
| S.E., mean=13.71 lb./ac.

---

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

**Site :- Agri. Res. Stn., Halvad.**

**Ref :- Gj. 55(34).**

**Type :- 'C'.**

Object :-To find out suitable dates of sowing for Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) Sano green manure. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) As per treatments. (iv) (a) Two harrowings. (b) Dibbling. (c) N.A. (d) 3’×5’. (e) 4 seeds per dibble. (v) Nil. (vi) 170—Co. 2. (vii) Irrigated. (viii) Two interculturings. (ix) 13.75°. (x) 1.2.1956, 15.2.1956, and 5.3.1956.

2. TREATMENTS:

5 dates of sowing: D1=15.5.1955, D2=1.6.1955, D3=15.6.1955, D4=1.7.1955 and D5=15.7.1955.
3. DESIGN:
(i) L.Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 51’×18’. (b) 45’×12’. (v) 3’×3’. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Light attack of top-borers, black-arm and semi-loopers. (iii) Kapas yield. (iv) (a) 1955—N.A. (modified in 1957). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 80 lb./ac. (ii) 92.36 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1029</td>
<td>886</td>
<td>889</td>
<td>652</td>
<td>547</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=41.29 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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

**Site :- Agri. Res. Stn., Halvad.**

Object :- To find out suitable dates of sowing for Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) As per treatments. (iv) (a) Two ploughings and 1 harrowing. (b) Dilling. (c) 4 lb./ac. (d) 3’×5’. (e) 6 seeds per dibble. (v) 75 lb./ac. of N at sowing, 250 lb./ac. of N top-dressed and 16 lb./ac. of P2O5 drilled. (vi) 170—Co. 2. (vii) Irrigated. (viii) One interculturing. (ix) 33.75”. (x) 19, 20.2.1957; 8.3.1957.

**TREATMENTS:**
Due to continuous rains D6 was not sown and hence dropped. Expt. analysed as R.B.D.

3. DESIGN:
(i) L.Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 51’×18’. (b) 45’×12’. (v) 3’×3’. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Moderate attack of jassids, aphids and boll-worm. (iii) Kapas yield. (iv) (a) 1955—N.A. (modified in 1957). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 673 lb./ac. (ii) 98.33 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>657</td>
<td>736</td>
<td>682</td>
<td>617</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=43.9 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Crop :- Cotton.**

**Site :- Agri. Res. Stn., Halvad.**

**Ref :- Gj. 56(33).**

Object :- To find out suitable dates of sowing and spacing for Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) 200 lb./ac. each of Super, A/S and manure mixture. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) As per treatments. (iv) (a) Ploughings and harrowings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (f) Nil. (g) 170—Co. 2. (h) Irrigated. (i) Gap-filling, interculturing and weeding. (ix) 33.75”. (x) 18.12.1957 and 25.1.1958.
2. TREATMENTS:

Main-plot treatments:

3 spacings between plants: \( S_1 = 3', S_2 = 4' \) and \( S_3 = 5' \).

Sub-plot treatments:

5 dates of sowing: \( D_1 = 15.5.1957 \), \( D_2 = 1.6.1957 \), \( D_3 = 15.6.1957 \), \( D_4 = 4.7.1957 \) and \( D_5 = 18.7.1957 \). Spacing between rows is 3'.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) One row on either side. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Light attack of black-arm, semi-loopers, aphids and jassids. (iii) Height, width and number of bolls/plant. (iv) (a) 1957—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 412 lb./ac. (ii) (a) 124.6 lb./ac. (b) 110.5 lb./ac. (iii) Main effect of \( D \) alone is highly significant. (iv) Av. yield of \( kapas \) in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( D_1 )</th>
<th>( D_2 )</th>
<th>( D_3 )</th>
<th>( D_4 )</th>
<th>( D_5 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>536</td>
<td>560</td>
<td>409</td>
<td>272</td>
<td>259</td>
<td>407</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>565</td>
<td>595</td>
<td>418</td>
<td>312</td>
<td>222</td>
<td>422</td>
</tr>
<tr>
<td>( S_3 )</td>
<td>522</td>
<td>514</td>
<td>460</td>
<td>242</td>
<td>299</td>
<td>407</td>
</tr>
<tr>
<td>Mean</td>
<td>541</td>
<td>556</td>
<td>429</td>
<td>272</td>
<td>260</td>
<td>412</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. S marginal means = -39.31 lb./ac.
2. D marginal means = 44.97 lb./ac.
3. D means at the same level of S = 78.14 lb./ac.
4. S means at the same level of D = 80.29 lb./ac.

Crop :- Cotton (Kharif).


Ref :- Gj. 58(73).

Type :- 'C'.

Object :- To find out suitable dates of sowing and spacing for Cotton.

1. BASAL CONDITIONS:

(i) (a) Legume—Cereal—Cotton. (b) Groundnut. (c) 200 lb./ac. of \( P_2O_5 \). (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) As per treatments. (iv) (a) Ploughing and harrowing. (b) Drilling. (c) N.A. (d) As per treatments. (e) N.A. (f) 20 C.L./ac. of compost. (vi) 170—Co. 2. (vi) Irrigated. (vii) N.A. (vii) 13’. (x) N.A.

2. TREATMENTS:

Main-plot treatments:

3 spacings between plants: \( S_1 = 3' \), \( S_2 = 4' \) and \( S_3 = 5' \).

Sub-plot treatments:

5 dates of sowing: \( D_1 = 15.5.1958 \), \( D_2 = 1.6.1958 \), \( D_3 = 15.6.1958 \), \( D_4 = 17.7.1958 \) and \( D_5 = 18.7.1958 \). Spacing between rows is 3'.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 40’ x 12’. (b) 34’ x 6’. (v) 3’ x 3’. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Attack of shoot-borer and black-arm. iii) \( kapas \) yield. (iv) (a) 1957—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 791 lb./ac. (ii) (a) 161.2 lb./ac. (b) 198.2 lb./ac. (iii) Main effect of D is highly significant. Interaction S×D is significant. Main effect of S is 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>D₅</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>1001</td>
<td>1267</td>
<td>860</td>
<td>561</td>
<td>539</td>
<td>846</td>
</tr>
<tr>
<td>S₂</td>
<td>1014</td>
<td>1019</td>
<td>698</td>
<td>537</td>
<td>441</td>
<td>754</td>
</tr>
<tr>
<td>S₃</td>
<td>1360</td>
<td>794</td>
<td>767</td>
<td>474</td>
<td>469</td>
<td>773</td>
</tr>
<tr>
<td>Mean</td>
<td>1125</td>
<td>1051</td>
<td>775</td>
<td>521</td>
<td>483</td>
<td>791</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. S marginal means = 50.98 lb./ac.
2. D marginal means = 80.89 lb./ac.
3. D means at the same level of S = 140.1 lb./ac.
4. S means at the same level of D = 135.4 lb./ac.

Crop :- Cotton (Kharif).


Ref. :- Gj. 59(14).

Type :- 'C'.

Object :- To find out suitable dates of sowing and spacing for Cotton.

1. BASAL CONDITIONS:

(i) (a) Legume—Cereal—Cotton. (b) Cumin in Rabi and groundnut in Kharif. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) As per treatments. (iv) (a) 1 ploughing and 2 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 2 to 3 seeds/dibble. (v) Nil. (vi) Co₅—170. (vii) Irrigated. (viii) Three interculturings and 4 weedings. (ix) 34°. (x) 6.11.1959.

2. TREATMENTS and 3 DESIGN:

Same as in expt. no. 58(73) on page 288.

4. GENERAL:

(i) Good. (ii) Light attack of grass hopper, shoot-borer and red cotton bugs; spray of endrine. (iii) Kapas yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 425 lb./ac. (ii) (a) 113.7 lb./ac. (b) 117.7 lb./ac. (iii) Main effect of D alone is highly significant. No other effect is 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>D₅</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>709</td>
<td>558</td>
<td>396</td>
<td>343</td>
<td>252</td>
<td>452</td>
</tr>
<tr>
<td>S₂</td>
<td>620</td>
<td>457</td>
<td>449</td>
<td>247</td>
<td>290</td>
<td>413</td>
</tr>
<tr>
<td>S₃</td>
<td>634</td>
<td>645</td>
<td>369</td>
<td>195</td>
<td>210</td>
<td>411</td>
</tr>
<tr>
<td>Mean</td>
<td>654</td>
<td>553</td>
<td>405</td>
<td>262</td>
<td>251</td>
<td>425</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. S marginal means = 35.95 lb./ac.
2. D marginal means = 48.03 lb./ac.
3. D means at the same level of S = 83.20 lb./ac.
4. S means at the same level of D = 82.64 lb./ac.
**Crop:** Cotton (Kharif).

**Site:** Agri. Res. Stn. Halvad.

**Object:** To find out the optimum spacing under irrigated conditions for Cotton.

### 1. BASAL CONDITIONS:

(i) (a) Nil. (b) and (c) N.A.  
(ii) (a) Medium black.  
(iii) 15.7.1954.  
(iv) (a) 1 harrowing. (b) Drilling.  
(v) 8 lb./ac.  
(vi) N.A.  

### 2. TREATMENTS:

4 spacings between plants: $S_1=3'$, $S_2=4'$, $S_3=5'$ and $S_4=6'$.

Spacing between rows is 3'.

### 3. DESIGN:

(i) L. Sq.  
(ii) 4.  
(iii) N.A.  
(iv) (a) 66'x24'; (b) 60'x18'; (v) 3'x3'. (vi) Yes.

### 4. GENERAL:

(i) Not satisfactory.  
(ii) Light attack of white ants.  
(iii) Kapas yield.  
(iv) (a) 1954—contd. (b) N.A.  
(c) Nil.  
(v) (a) and (b) N.A.  
(vi) and (vii) Nil.

### 5. RESULTS:

(i) 369 lb./ac.  
(ii) 53.2 lb./ac.  
(iii) Treatment differences are not significant.  
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
<th>Av. yield.</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>351</td>
<td>398</td>
<td>350</td>
<td>378</td>
<td>350 lb./ac.</td>
<td>26.6 lb./ac.</td>
</tr>
</tbody>
</table>

---

**Crop:** Cotton (Kharif).

**Site:** Agri. Res. Stn., Halvad.

**Object:** To find suitable number of plants per hill and spacing for Cotton.

### 1. BASAL CONDITIONS:

(i) (a) Nil. (b) Sann. (c) Nil.  
(ii) (a) Medium black.  
(iii) 25.6.1955.  
(iv) (a) One ploughing and 2 harrowings. (b) Dibbling.  
(v) 3, 5, 7, 11 seeds/dibble.  
(vi) 50 lb./ac. of $P_2O_5$ broadcast before sowing. (vii) Co2=170. (viii) Irrigated. (ix) 4 interculturings. (x) 13.75. (xi) 2.4.1956.

### 2. TREATMENTS:

Main-plot treatments:

3 spacings between plants: $S_1=3'$, $S_2=4'$ and $S_3=5'$.

Sub-plot treatments:

No. of plants/hill: $A_1=1$, $A_2=2$, $A_3=3$ and $A_4=4$ plants/hill.  
Spacing between rows is 3'.

### 3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot.  
(iii) 4.  
(iv) (a) 51'x18'.  
(b) 45'x12'. (v) 3'x3'. (vi) Yes.

### 4. GENERAL:

(i) Satisfactory.  
(ii) Light attack of Jassids and aphids and two sprayings of Geigy—1250.  
(iii) Kapas yield.  
(iv) (a) 1955—N.A.  
(b) No.  
(c) Nil.  
(v) (a) and (b) N.A.  
(vi) and (vii) Nil.

### 5. RESULTS:

(i) 820.2 lb./ac.  
(ii) (a) 67.15 lb./ac.  
(b) 119.2 lb./ac.  
(iii) Main effect of $S$ is highly significant. No other effect is significant.  
(iv) Av. yield of kapas in lb./ac.
Object:—To find out suitable number of plants per hill and spacing for Cotton.

1. BASAL CONDITIONS:
   (i) (a) Wheat—Cotton. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 27.6.1957. (iv) (a) One ploughing and 1 harrowing. (b) Dibbling. (c) N.A. (d) and (e) As per treatments. (v) Nil. (vi) Co₂: 170. (vii) Irrigated. (viii) Three weedings. (ix) 15.09°. (x) 6.1.1958.

2. TREATMENTS:
   Main-plot treatments:
   4 spacings between plants: S₁=9", S₂=18", S₃=27" and S₄=36”.
   Sub-plot treatments:
   No. of plants/hill: A₁=1, A₂=2, A₃=3 and A₄=4 plants/hill.
   Spacing between rows is 3’.

3. DESIGN:
   (i) Split-plot. (ii) 4 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 40’x12’. (b) 34’x6’. (v) 3’x3’. (vi) Yes.

4. GENERAL:
   (i) Poor. (ii) Light attack of Jassids and aphids. (iii) Seed cotton. (iv) (a) and (b) N.A. (c) Nil. (v) (a) and (b) Nil. (vi) Hard crust was formed due to heavy rains immediately after dibbling and hence the poor yield. (vii) Nil.

5. RESULTS:
   (i) 540 lb./ac. (ii) (a) 64.06 lb./ac. (b) 78.68 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of kapas 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>A₁</td>
<td>578</td>
<td>509</td>
<td>450</td>
<td>559</td>
</tr>
<tr>
<td>A₂</td>
<td>502</td>
<td>572</td>
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<td>552</td>
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<tr>
<td>A₃</td>
<td>532</td>
<td>539</td>
<td>585</td>
<td>551</td>
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<td>A₄</td>
<td>502</td>
<td>509</td>
<td>629</td>
<td>539</td>
</tr>
<tr>
<td>Mean</td>
<td>529</td>
<td>532</td>
<td>549</td>
<td>530</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. S marginal means =45.30 lb./ac.
2. A marginal means =55.63 lb./ac.
3. A means at the same level of S =55.64 lb./ac.
4. S means at the same level of A =53.24 lb./ac.

Crop:—Cotton (Kharif).
Site:—Agri. Res. Stn., Halvad.
Ref:—Gj. 57(124).
Type:—'C'.
Crop :- Cotton (Kharif).
Site :- Dry Farming Res. Stn., Jamkhamlia.
Object :- To find out the suitable spacing and seed rate for Cotton.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Medium shallow. (b) N.A. (iii) 13.7.1959. (iv) (a) One ploughing and 2 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) CJ—73. (vii) Unirrigated. (viii) Three interculturings and 2 weedings. (ix) 44'. (x) 2, 9.4.1960 and 8.5.1963.

2. TREATMENTS :
Main-plot treatments :
Three spacings between rows : S1=18", S2=27" and S3=36".
Sub-plot treatments :
Three seed rates : R1=10, R2=15 and R3=20 lb./ac.

3. DESIGN :
(i) Split-plot. (ii) (a) 3 main-plots/repetition ; 3 sub-plots/main-plot. (b) 27'5×280' ii) (a) 45'×30'. (b) 39'×24'. (vi) 3'×3'. (vii) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Shoot borer attack. (iii) Kapas yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) 'a' and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
i, 210 lb./ac. (ii) (a) 72.96 lb./ac. (b) 66.06 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>211</td>
<td>219</td>
<td>248</td>
<td>226</td>
</tr>
<tr>
<td>S2</td>
<td>192</td>
<td>213</td>
<td>227</td>
<td>211</td>
</tr>
<tr>
<td>S3</td>
<td>196</td>
<td>190</td>
<td>194</td>
<td>193</td>
</tr>
<tr>
<td>Mean</td>
<td>200</td>
<td>207</td>
<td>223</td>
<td>210</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. S marginal means =24.32 lb./ac.
2. R marginal means =22.02 lb./ac.
3. R means at the same level of S =38.14 lb./ac.
4. S means at the same level of R =39.52 lb./ac.

---

Crop :- Cotton (Kharif).
Site :- Dry Farming Res. Stn., Jamkhamlia.
Object :- To study the effect of interculturings on Cotton.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Medium black. (b) N.A. (iii) 13.7.1959. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 15 lb./ac. (d) and (e) N.A. (v) Nil. (vi) CJ—73. (vii) Unirrigated. (viii) As per treatments. (ix) 44'. (x) 2, 9.4.1960 and 8.5.1960.

2. TREATMENTS :
1. No interculturing.
2. 1 interculturing 6 weeks after sowing.
3. 2 interculturings 4 and 6 weeks after sowing.
4. 3 interculturings 4, 6 and 8 weeks after sowing.

3. DESIGN :
(i) R.B.D. (ii) (a) 4. (b) 197'×100' (iii) 6. (iv) (a) 30'×24'. (b) 24'×18'. (v) 3'×3'. (vi) Yes.
4. GENERAL:
(i) Satisfactory. (ii) Red cotton bug attack. (iii) Kapas yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 153.2 lb./ac. (ii) 83.52 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>183.1</td>
<td>138.1</td>
<td>181.0</td>
<td>110.7</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>48.22 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Ref :- Gj. 56(93).
Type :- 'C'.

Object :- To study the effect of topping on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) —. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) N.A. (iv) (a) N.A. (b) Drilling. (c) 20 lb./ac. (d) 3' between rows. (e) N.A. (v) Nil. (vi) Pratap. (vii) Unirrigated. (viii) and (ix) N.A. (x) 6.12.1956 and 22.1.1957.

2. TREATMENTS:
1. Control
2. Topping and removing the topped material,
3. Topping and allowing the topped material in the field.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 12'×18'. (b) 6'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Seed cotton. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 303 lb./ac. (ii) 36.58 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>275</td>
<td>312</td>
<td>321</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>21.12 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Ref :- Gj. 57(113).
Type :- 'C'.

Object :- To study the effect of topping on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 8.7.1957. (iv) (a) N.A. (b) Drilling. (c) N.A. (d) 3' between rows. (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) 34'. (x) 14.11.1957 and 16.12.1957.

2. TREATMENTS:
Same as in expt. no. 56(93) above.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 24'×15'. (b) 20'×9'. (v) 2'×3'. (vi) Yes.
4. GENERAL:
(i) N.A. (ii) Nil. (iii) Seed cotton. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1678 lb./ac. (ii) 205.7 lb./ac. (iii) Treatment differences are not significant. [(iv) Av. yield of kapas in lb./ac.]

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1632</td>
<td>1616</td>
<td>1787</td>
</tr>
</tbody>
</table>

S.E. of mean = 118.8 lb./ac.

---

**Crop:** Cotton.  
**Site:** Cotton Breeding Sub-Stn., Kodiyadra.  
**Ref:** Gj. 54(58).  
**Type:** ‘CV’.

Object:—To find out optimum spacing for different varieties of Cotton.

1. BASAL CONDITIONS:
(i) (a) Cotton—Cotton. (b) Cotton. (c) Nil. (ii) (a) Shallow goradu. (b) N.A. (iii) 9.7.1953. (iv) (a) Two to three harrowings after the first shower. (b) Dibbling. (c) 3 lb./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Two to three weedings and 3 to 4 interculturings. (ix) 56.80°. (x) 8.1.1954 to 5.3.1954.

2. TREATMENTS:
All combinations of (1) and (2)
1. 2 varieties: \( V_1 \) and \( V_2 \)
2. 2 spacings: \( S_1 = 2' \times 2' \) and \( S_2 = 5' \times 2' \).

3. DESIGN:
(i) Fact. in R.B.D. (ii) 4. (b) N.A. (iii) 6. (iv) (a) 25'\times32'. (b) 15'\times28'. (v) One row on either side for \( S_2 \) and 2 rows on either side for \( S_1 \). One dibble at either end of the row. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Slight attack of leaf roller and boll worm. Khakhara disease. (iii) Kopas yield. (iv) (a) 1954—N.A. (b) No. (c) N.A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 433.9 lb./ac. (ii) 52.89 lb./ac. (iii) Main effect of S is highly significant. Effect of V and interaction \( V \times S \) are significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>475.4</td>
<td>439.1</td>
</tr>
<tr>
<td>( V_2 )</td>
<td>471.9</td>
<td>349.2</td>
</tr>
</tbody>
</table>

Mean 473.6 394.1 433.9
S.E. of any marginal mean = 15.27 lb./ac.
S.E. of body of table = 21.57 lb./ac.

---

**Crop:** Cotton.  
**Site:** Agri. Res. Stn., Amreli.  
**Ref:** Gj. 54(12).  
**Type:** ‘CM’.

Object:—To find out optimum spacing and combination of N and P for Cotton.
1. BASAL CONDITIONS:
(i) (a) Cotton—Groundnut (Kharif)—Wheat. (b) Udid over Kharif groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 6.7.1954 to 8.7.1954. (iv) (a) 2 harrowings and ploughing, levelling and marking. (b) Dibbling. (c) 15 to 20 lb./ac. (d) As per treatments. (e) 4 to 5 seeds/hole. (v) 5 C.L./ac. of F.Y.M. during June before preparatory tillage by broadcasting. (vi) Pratap (medium). (vii) Unirrigated. (viii) 3 to 4 interculturings and weedings. (ix) 26.70°. (x) 5.12.1954 to 27.12.1954 and 18.1.1955.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2):
(1) 3 levels of N as A/Sand G.N.C.(1 : 1): N₀ =0, N₁ =30 and N₂ =60 lb./ac.
(2) 3 levels of P₂O₅ as Super: P₀ =0, P₁ =30 and P₂ =60 lb./ac.
Sub-plot treatments:
3 spacings between rows: S₁ =12", S₂ =18" and S₃ =24".

3. DESIGN:
(i) Split-plot. (ii) (a) 9 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 63'×16' for S₁ and S₂ and 63'×15' for S₃ (b) 60'×12'. (v) One row for S₂ and S₃ and 2 rows for S₁ on either side and 1.5' at each end. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Kapas yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 326.4 lb./ac. (ii) (a) 165.8 lb./ac. (b) 62.64 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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<tr>
<td>P₀</td>
<td>183.6</td>
<td>346.0</td>
<td>410.6</td>
<td>313.4</td>
<td>358.9</td>
<td>310.8</td>
<td>270.5</td>
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<tr>
<td>P₁</td>
<td>329.4</td>
<td>274.8</td>
<td>322.1</td>
<td>308.8</td>
<td>358.2</td>
<td>315.0</td>
<td>253.1</td>
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<tr>
<td>P₂</td>
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<td>345.4</td>
<td>387.9</td>
<td>357.0</td>
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<tr>
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<td>322.1</td>
<td>373.5</td>
<td>326.4</td>
<td>379.8</td>
<td>319.1</td>
<td>280.3</td>
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<tr>
<td>S₁</td>
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<tr>
<td>S₃</td>
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<td>277.2</td>
<td>330.0</td>
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</tr>
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</table>

S.E. of difference of two.
1. N or P marginal means =39.08 lb./ac.
2. S marginal means =14.76 lb./ac.
3. S means at the same level of N or P =25.57 lb./ac.
4. N or P means at the same level S =44.34 lb./ac.
S.E. of body of N×P table =47.86 lb./ac.

Crop := Cotton.
Ref := Gj. 58(71).
Type := 'CM'.
Object := To find out optimum spacing and combination of N and P for Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Groundnut. (c) 35 lb./ac. of manure mixture. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 8.7.1954. (iv) (a) N.A. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) CJ—73. (vii) Unirrigated. (viii) N.A. (ix) 28.50°. (x) N.A.
2. TREATMENTS:

Main-plot treatments:
- 6 spacings: $S_1 = 18" \times 6", S_2 = 18" \times 9", S_3 = 27" \times 6", S_4 = 27" \times 9", S_5 = 36" \times 6", S_6 = 36" \times 9"$.

Sub-plot treatments:
- 3 manural doses: $M_0 =$ Control, $M_1 = 20$ lb./ac. of $P_2O_5$, $M_2 = 40$ lb./ac. of $P_2O_5$.
- Time, method of application and source of manure - N.A.

3. DESIGN:
- (i) Split-plot.
- (ii) 6 main-plots, replication; 3 sub-plots, main-plot.
- (b) N.A.
- (iii) 3.
- (iv) (a) 30" x 24".
- (b) 27" x 18".
- (v) 1.5" x 3".
- (vi) Yes.

4. GENERAL:
- (i) and (ii) N.A.
- (vi) Kapas yield.
- (v) (a) 1958—1960.
- (b) N.A.
- (v) (a) and (b) N.A.
- (vi) and (vii) Nil.

5. RESULTS:
- (i) 280 lb./ac.
- (ii) (a) 79.05 lb./ac.
- (b) 52.43 lb./ac.
- (iii) Main effect of $M$ alone is highly significant.
- (iv) Av. yield of kapas 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>$S_6$</th>
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<td>$M_1$</td>
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<td>$M_2$</td>
<td>294</td>
<td>344</td>
<td>300</td>
<td>348</td>
<td>324</td>
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<td>285</td>
<td>278</td>
<td>244</td>
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</tr>
</tbody>
</table>

S.E. of difference of two
1. $S$ marginal means $= 37.26$ lb./ac.
2. $M$ marginal means $= 17.47$ lb./ac.
3. $M$ means at a level of $S$ $= 42.80$ lb./ac.
4. $S$ means at a level of $M$ $= 51.09$ lb./ac.

---

**Crop:** Cotton.  
**Site:** Agrl. Res. Stn., Amreli.  
**Ref:** Gj. 59(54).  
**Type:** 'CM'.

Object — To find out optimum spacing and combination of N and P for Cotton.

1. BASAL CONDITIONS:
- (i) Nil.  
- (ii) Groundnut.  
- (c) 30 lb./ac. of manure mixture.
- (ii) (a) Medium black.  
- (b) Refer soil analysis, Amreli.
- (iii) 12.7.1959.
- (iv) (a) N.A.  
- (b) Dibbling.  
- (c) N.A.  
- (d) As per treatments.  
- (e) N.A.  
- (x) Nil.  
- (vi) CJ—73.  
- (vii) Uairrigated.  
- (viii) N.A.  
- (ix) 45.56".  
- (x) N.A.

2. TREATMENTS and 3. DESIGN:

Same as in exp. no. 58(71) on page 295.

4. GENERAL:
- (i) Low yield due to adverse climatic conditions.  
- (ii) N.A.  
- (iii) Kapas yield.  
- (iv) (a) 1958—1960.  
- (b) No.  
- (c) Nil.  
- (v) (a) and (b) N.A.  
- (vi) and (vii) Nil.

5. RESULTS:
- (i) 64.8 lb./ac.  
- (ii) (a) 25.10 lb./ac.  
- (b) 38.6 lb./ac.  
- (iii) Main effect of $S$ is significant. Effect of $M$ is highly significant. No other effect is significant.  
- (iv) Av. yield of kapas in lb./ac.
Crop :- Cotton.  
Site :- Trial-cum-Demonstration Farm, Bardoli.  
Ref :- Gj. 58(84).  
Type :- 'CM'.

Object :- To study the effect of inorganic and organic manures along with spacing on the yield of Cotton.

1. BASAL CONDITIONS :
(i) (a) Nil.  (b) Gram and Jowar.  (c) Nil.  (ii) (a) Black.  (b) Refer soil analysis, Bardoli.  (iii) 22.7.1958, (iv) (a) Two harrowing and ploughings.  (b) Dibbling.  (c) and (d) N.A.  (v) Nil.  (vi) Cotton-2087 (late).  (vii) Irrigated.  (viii) 8 interculturings.  (ix) 68.23".  (x) 18.3.1959, 31.3.1959, 18.4.1959 and 4.5.1959.

2. TREATMENTS :  
Main-plot treatments :  
All combinations of (1), (2), (3) and (4)  
(1) 2 levels of P\textsubscript{2}O\textsubscript{5} : P\textsubscript{0} = 0 and P\textsubscript{1} = 60 lb./ac.
(2) 2 levels of K\textsubscript{2}O : K\textsubscript{0} = 0 and K\textsubscript{1} = 120 lb./ac.
(3) 2 spacings between rows : S\textsubscript{1} = 3' and S\textsubscript{2} = 4'.
(4) 2 doses of F.Y.M. : F\textsubscript{0} = 0 and F\textsubscript{1} = 10 C.L./ac.

Sub-plot treatments :  
3 levels of N : N\textsubscript{0} = 30, N\textsubscript{1} = 60 and N\textsubscript{2} = 90 lb./ac.
Spacing between plants is 2'.

3. DESIGN :  
(i) Split-plot.  (ii) 3 sub-plots/main-plot, 8 main-plots/block ; 2 blocks/replication.  (b) N.A.  (iii) 2.  
(iv) (a) 24'×44'.  (b) 12'×36'.  (v) 6'×4'.  (vi) Yes.

4. GENERAL :  
(i) Good.  (ii) Nil.  (iii) Kapas yield.  (iv) (a) 1958—contd.  (b) N.A.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS :
(i) 891 lb./ac.  (ii) (a) 160.1 lb./ac.  (b) 100.8 lb./ac.  (iii) Main effects of F is significant and effect N is highly significant. No other effect is significant.  (iv) Table of mean and differential responses.

<table>
<thead>
<tr>
<th>Mean response</th>
<th>P</th>
<th>K</th>
<th>S</th>
<th>F</th>
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<tr>
<td></td>
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<tr>
<td>P  -20.14</td>
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<tr>
<td>K -40.98</td>
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</tr>
<tr>
<td>F  +55.52</td>
<td>-</td>
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</tr>
</tbody>
</table>

S.E. of mean response = 32.69 lb./ac.
S.E. of differential response = 46.23 lb./ac.
Object: To study the effect of inorganic and organic manures along with spacing on the yield of Cotton

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) 5 C.L. of F.Y.M. + 6 C.L. of press mud + 300 lb. of G.N.C. + 100 lb. of A/P + 100 lb. of Super to whole experiment. (ii) (a) Black. (b) Refer soil analysis, Bardoli. (iii) 30.6.1959. (iv) (a) Three ploughings. (b) Dibbling. (c) and (d) N.A. (v) Nil. (vi) Cotton—2087. (vii) Irrigated. (viii) 6 interculturings and 3 weedings. (ix) 11.3.1960.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1), (2), (3) and (4)
   (1) 2 levels of $P_0$: $P_0 = 0$ and $P_1 = 60$ lb./ac.
   (2) 2 levels of $K_0$: $K_0 = 0$ and $K_1 = 120$ lb./ac.
   (3) 2 spacings between rows: $S_1 = 3'$ and $S_2 = 4'$.
   (4) 2 doses of F.Y.M.: $F_0 = 0$ and $F_1 = 10$ C.L.fac.

   Sub-plot treatments:
   4 levels of $N$: $N_0 = 0$, $N_1 = 30$, $N_2 = 60$ and $N_3 = 90$ lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 8 main-plots/block; 2 blocks/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 24'x44'. (b) 12'x36'. (v) 6'x4'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Kapas yield. (iv) (a) 1958—contd. (modified in 1959) (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 457 lb./ac. (ii) (a) 201.5 lb./ac. (b) 113.0 lb./ac. (iii) Main effect of $N$ and interaction $K \times S$ are highly significant. No other effect is significant. (iv) Table of mean and differential responses.

### Differential response

<table>
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<tr>
<th>Mean response</th>
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<td>F 60.32</td>
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</tbody>
</table>

S.E. of mean response = 35.61 lb./ac.
S.E. of differential response = 35.36 lb./ac.
Crop :- Cotton.
Site :- Agri. Res. Sta., Halvad.
Ref :- Gj. 55(35).
Type :- 'CM'.

Object :- To find out suitable doses of fertilizers along with spacing for Cotton.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Sann. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 23.6.1955. (iv) (a) One ploughing and 2 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 3 seeds/dibble. (v) Nil. (vi) CO₂—170. (vii) Irrigated. (viii) Four interculturings. (ix) 13.75". (x) 13.2.1956, 4 and 29.3.1956.

2. TREATMENTS :
   Main-plot treatments :
   3 spacings : S₁=3'×3', S₂=3'×4' and S₃=3'×5'.
   Sub-plot treatments :
   M₀=Control.
   M₁=30 lb./ac. of N+20 lb./ac. of P₂O₅.
   M₂=30 lb./ac. of N+40 lb./ac. of P₂O₅.
   M₃=60 lb./ac. of N+40 lb./ac. of P₂O₅.
   M₄=60 lb./ac. of N+60 lb./ac. of P₂O₅.
   M₅=90 lb./ac. of N+60 lb./ac. of P₂O₅.
   N as A/S top dressed and P₂O₅ as Super applied before sowing.

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 51'×18'. (b) 45'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Slight attack of Jassids aphids and top borer. 2 sprayings of Geizy—1250. (iii) Kapas yield. (iv) (a) 1955—N.A. (modified in 1956). (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vi) Nil.

5. RESULTS :
   (i) 744 lb./ac. (ii) (a) 138.1 lb./ac. (b) 114.6 lb./ac. (iii) Interaction M×S alone is highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>K₀</th>
<th>K₁</th>
<th>S₁</th>
<th>S₂</th>
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<td>N₃</td>
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<td>438</td>
<td>476</td>
<td>450</td>
<td>464</td>
<td>427</td>
<td>487</td>
<td>457</td>
</tr>
</tbody>
</table>

S.E. of difference two
1. N marginal means =28.26 lb./ac.
2. N means at a level of P, K, S or F =39.95 lb./ac.
3. P, K, S, or F means at a level of N =49.66 lb./ac.
Crop :- Cotton.  
Ref :- Gj. 56(34).  
Type :- 'CM'.

Object :- To find out suitable doses of fertilizers along with spacing for Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) 200 lb./ac. of Super+300 lb./ac. of A/S.  
   (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 12.7.1956. (iv) (a) One ploughing and 2 harrowings. (b) Dibbling. (c) 24, 12, 9 and 6 lb./ac. for S1, S2, S3 and S4 respectively.  
   (d) As per treatments. (e) N.A. (f) Nil. (g) Co2=170.  
   (vii) Irrigated. (viii) Four interculterings. (ix) 33.75°.  
   (x) 1.3.1957 and 14.3.1957.

2. TREATMENTS:
   Main-plot treatments:
   4 spacings: S1=3'x9", S2=3'x18", S3=3'x27" and S4=3'x36".
   Sub-plot treatments:
   M0=Control.  
   M1=30 lb./ac. of N+30 lb./ac. of P2O5.  
   M2=60 lb./ac. of N+30 lb./ac. of P2O5.  
   M3=60 lb./ac. of N+60 lb./ac. of P2O5.  

   N applied as A/S top dressed and P2O5 as Super before sowing.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block; 4 sub-plots/main-plot.  
   (b) N.A.  
   (iii) (a) 40’x12’ (b) 34’x6’. (c) 3’x3’. (vii) Yes.

4. GENERAL:
   (i) Normal. (ii) Slight attack of jassids and aphids. (iii) Kapas yield.  
   (iv) (a) 1955—N.A. (modified in 1956). (b) No. (c) N.A. (v) (a) and (b) N.A.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 797 lb./ac. (ii) (a) 207.5 lb./ac. (b) 119.2 lb./ac. (iii) Effect of M alone is highly significant. (iv) Av yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
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<td>799</td>
<td>850</td>
<td>797</td>
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</table>

S.E. of difference of two  
1. S marginal means = 73.40 lb./ac. 
2. M marginal means = 42.14 lb./ac. 
3. M means at the same level of S = 84.29 lb./ac. 
4. S means at the same level of M = 103.5 lb./ac. 

Crop :- Cotton.  
Ref :- Gj. 57(39).  
Type :- 'CM'.

Object :- To find out suitable doses of fertilizers along with spacing for Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 5.7.1957. (iv) (a) Preparatory tillage, ploughing and harrowing. (b) and (c) N.A.  
   (d) As per treatments. (e) N.A. (f) Nil. (vi) Co2=170. (vii) Irrigated. (viii) Gap-filling, interculturing and weeding. (ix) 15.09°. (x) N.A.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 56,34, above.
4. GENERAL:
   (i) Satisfactory. (ii) Slight attack of aphids, jassids, red-leaf and black-arm diseases. (iii) Height and width of plants, no. of bolls/plant, etc. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 442 lb./ac. (ii) (a) 108.9 lb./ac. (b) 110.9 lb./ac. (iii) Effect of M alone is highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
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<td>450</td>
<td>454</td>
<td>414</td>
<td>442</td>
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</table>

S.E. of difference of two:
1. S marginal means = 44.43 lb./ac.
2. M marginal means = 45.26 lb./ac.
3. M means at the same level of S = 90.11 lb./ac.
4. S means at the same level of M = 90.57 lb./ac.

Crop: Cotton.  
Ref: Gj. 58(27).  
Type: ‘CM’.

Object: To find out suitable doses of fertilizers along with spacing for Cotton.

1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton. (b) Groundnut. (c) 20 lb./ac. of P2O5. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 28.7.1958. (iv) (a) 2 ploughings and 2 harrowings. (b) Drilling. (c) 5 lb./ac. (d) As per treatments. (e) Nil. (vi) Co2—170. (vii) Irrigated. (viii) 2 interculturings and 3 weedings. (ix) 15.1’. (x) 28.1.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 56(34) on page 300.

4. GENERAL:
   (i) Good. (ii) Attack of black-arm and shoot-borer disease. (iii) Kapas yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 579 lb./ac. (ii) (a) 108.2 lb./ac. (b) 66.94 lb./ac. (iii) Effect of M and interaction M×S are significant. (iv) Av. yield of kapas in lb./ac.

<table>
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</tbody>
</table>

S.E. of difference of two:
1. S marginal means = 44.15 lb./ac.
2. M marginal means = 27.32 lb./ac.
3. M means at the same level of S = 54.65 lb./ac.
4. S means at the same level of M = 64.70 lb./ac.
Crop :- Cotton.  
Site :- Central Expt. Stn., Junagadh.  
Object :-To find out suitable doses of fertilizers along with spacing for Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 4.7.1959.  
   (iv) (a) 1 ploughing and 2 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 3 to 4 seeds/dibble.  

2. TREATMENTS and DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot. (b) 36'X32'. (c) 40'X12'. (d) N.A. (v) Yes.

3. GENERAL:
   (i) Same as in expt. no. 58(91) above.

4. RESULTS:
   (i) 258 lb./ac. (ii) (a) 95.99 lb./ac. (b) 88.13 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of kapas in lb./ac.
Crop: Cotton.


Ref. : Gj. 58(114).

Type: 'CM'.

Object: To study the response of Cotton under irrigated conditions to graded dose of manures and spacings.

1. BASAL CONDITIONS:

(i) (a) Cotton—Jowar. (b) Jowar. (c) Nil. (ii) (a) Medium black. (b) N.A. (iii) 23.6.1958. (iv) (a) 3 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 3 seeds/dibble. (f) Nil. (vi) Cotton—2087 (medium). (vii) Irrigated. (viii) Two weedings. (ix) 69.49”. (x) 13.2.1959, 21.2.1959, 11.3.1959 and 29.3.1959.

2. TREATMENTS:

Main-plot treatments:

All combinations of (1), (2), (3) and (4).

(1) 2 levels of \( P_2O_5 \) as Super: \( P_0=0 \) and \( P_1=60 \) lb./ac.

(2) 2 levels of \( K_2O \) as Mur. of Pot.: \( K_0=0 \), \( K_1=120 \) lb./ac.

(3) 2 spacings between rows: \( S_1=3 \) and \( S_2=4' \).

(4) 2 levels of F.Y.M.: \( F_0=0 \), \( F_1=10 \) C.L./ac.

Sub-plot treatments:

3 levels of N as A/S: \( N_0=30 \), \( N_1=60 \) and \( N_2=90 \) lb./ac. \( P_2O_5 \) and \( K_2O \) applied in bands on 7.7.1958. and 23.7.1958. N also applied in bands on 4, 5.9.1958. F.Y.M. applied on 17.6.1958. and 19.6.1958. Spacing between plants is 2'.

3. DESIGN:

(i) Split-plot. (ii) (a) 8 main-plots/block; 2 blocks/replication. 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 44'x24'. (b) 36'x12'. (v) 4'x6'. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Attack of boll-worms in June, 1959. (iii) Kapas yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 643 lb./ac. (ii) (a) 84.50 lb./ac. (b) 66.47 lb./ac. (iii) Main effects of F, N and interaction \( S \times N \) are highly significant. Interaction \( K \times S \) is significant. All other effects are not significant. (iv) Mean and differential responses in lb./ac.

<table>
<thead>
<tr>
<th>Mean response</th>
<th>P</th>
<th>( K )</th>
<th>S</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>16.55</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>-5.71</td>
<td>-13.57</td>
<td>2.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.06</td>
<td>15.09</td>
<td>19.03</td>
<td>-34.07</td>
<td>68.19</td>
</tr>
<tr>
<td>167.00</td>
<td>195.32</td>
<td>138.68</td>
<td>155.24</td>
<td>178.76</td>
</tr>
</tbody>
</table>

S.E. of mean response = 17.25 lb. ac.

S.E. of differential response = 24.39 lb./ac.
Crop :- Cotton.  
Site :- Agri. Res. Stn., Kholwad.  
Ref :- Gj. 58(80).  
Type :- CM'.

Object :- To study the effect of inorganic and organic manures along with spacing on the yield of Cotton.

1. BASAL CONDITIONS :
(i) (a) Jowar- Cotton. (b) Jowar. (c) Nil.  
(ii) (a) Medium black. (b) N.A.  
(iii) 24.6.1958.  
(iv) 1 harrowing. (b) Dibbling. (c) N.A.  
(v) 3 to 4 reeds; dibble. (v) Nil.  
(vi) Co₂—170.  
(vii) Irrigated.  
(viii) 3 interculturings. (ix) 69.49". (x) 5 pickings on 4.2.1959, 12.2.1959, 18.2.1959, 28.2.1959 and 20.3.1959.

2. TREATMENTS and 3. DESIGN:
Same as in explt. no. 58(114) on page 303.

4. GENERAL:
(i) Normal.  
(ii) Attack of thrips, mutes etc. Folidol-E 605 was sprayed.  
(iii) Kupas yield.  
(iv) (a) 1958—contd. (b) N.A. (c) Nil.  
(v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 645 lb./ac.  
(ii) (a) 155.3 lb./ac. (b) 109.9 lb./ac.  
(iii) Main effects of P, S and F and N are significant and interaction N x P is highly significant. (iv) Mean and differential responses in lb./ac.

### Differential response

<table>
<thead>
<tr>
<th>Mean response</th>
<th>P</th>
<th>K</th>
<th>S</th>
<th>F</th>
</tr>
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<tr>
<td>P</td>
<td>161.0</td>
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<td>159</td>
<td>163</td>
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<tr>
<td>K</td>
<td>-22.0</td>
<td>-24</td>
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<td>-</td>
</tr>
<tr>
<td>F</td>
<td>282.0</td>
<td>314</td>
<td>250</td>
<td>295</td>
</tr>
</tbody>
</table>

S.E. of mean response = 31.69 lb./ac.  
S.E. of differential response = 44.82 lb./ac.
Crop: Cotton.  
Ref: Gj. 59(71).  
Type: 'CM'.

Object: To study the effect of inorganic and organic manures along with spacing on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Jowar—Cotton. (b) Jowar. (c) Sann G.M.+40 lb./ac. of N+20 lb./ac. of P_2O_5. (ii) (a) Medium black. (b) N.A. (iii) 26.6.1959. (iv) (a) 1 harrowing. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 3 seeds/dibble. (v) Nil. (vi) Co_2—170. (vii) Irrigated. (viii) 7 interculturings and 3 weedings. (ix) 106.5°. (x) N.A.

2. TREATMENTS:
   Main-plot treatments: All combinations of (1), (2), (3) and (4)
   (1) 2 levels of P_2O_5 as Super: P_0=0 and P_1=60 lb./ac.
   (2) 2 levels of K_2O as Mur. of Pot.: K_0=0 and K_1=120 lb./ac.
   (3) 2 spacings between rows: S_1=3' and S_2=4'.
   (4) 2 levels of F.Y.M.: F_0=0 and F_1=10 C.L./ac.
   Sub-plot treatments: 4 levels of N as A/S: N_0=0, N_1=30, N_2=60 and N_3=90 lb./ac.

3. DESIGN:
   Same as in expt. no. 59(76) on page 298.

4. GENERAL:
   (i) Satisfactory. (ii) Attack of jassids, thrips, aphids and boll-worm. Endrine sprayed on 3.1.1960 and 10.1.1960. (iii) Kapas yield. (iv) (a) 1958—contd. (modified in 1959). (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 618 lb./ac. (ii) (a) 135.1 lb./ac. (b) 96.8 lb./ac. (iii) Main effect of N is highly significant. Main effects of P and F and interactions P×K and N×P are significant. (iv) Mean and differential responses in lb./ac.

   **Differential response**

<table>
<thead>
<tr>
<th>Mean response</th>
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<th>S</th>
<th>F</th>
</tr>
</thead>
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<tr>
<td></td>
<td>−</td>
<td>+</td>
<td>−</td>
<td>+</td>
</tr>
<tr>
<td>P 125.5</td>
<td>1</td>
<td>73</td>
<td>93</td>
<td>162</td>
</tr>
<tr>
<td>K −1.0</td>
<td>−53</td>
<td>52</td>
<td>20</td>
<td>+4</td>
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<tr>
<td>S −42.5</td>
<td>−75</td>
<td>10</td>
<td>42</td>
<td>−30</td>
</tr>
<tr>
<td>F 88.5</td>
<td>+125</td>
<td>52</td>
<td>101</td>
<td>76</td>
</tr>
</tbody>
</table>

   S.E. of mean response =23.88 lb./ac.
   S.E. of differential response =33.78 lb./ac.
Crop :- Cotton.  
Ref :- Gj. 54(70).  
Type :- 'CM'.

Object :-To find out the response of Cotton to different manurial doses and spacings.

1. BASAL CONDITIONS :
(i) (a) Cotton—Jowar.  (b) Jowar.  (c) Nil.  (ii) (a) Deep black.  (b) Refer soil analysis, Surat. (iii) 25.6.1954.  
(iv) (a) 2 harrowings.  (b) and (c) N.A.  (d) As per treatments.  
(v) (a) 2 harrowings.  (b) and (c) N.A. (d) As per treatments.  

2. TREATMENTS :
Main-plot treatments :
N0=Control.  
N1=20 lb./ac. of N as A/S top dressed 6 to 7 weeks after sowing.  
N2=20 lb./ac. of N as A/S top dressed 3 to 4 weeks after sowing.  
N3=40 lb./ac. of N as A/S split into two doses 3 to 4 weeks and 6 to 7 weeks after sowing.  
N4=40 lb./ac. of N as A/S 3 to 4 weeks after sowing.

Sub-plot treatments :
2 spacings between plants : S1=2' and S2=3'.
Spacing between rows is 5'.

3. DESIGN :
(i) Split-plot.  (ii) (a) 5 main-plots/block and 2 sub-plots/main-plot.  (b) N.A. (iii) 4.  
(iv) (a) 42'×20'.  
(v) One row on either side and 1 plant at either end of each row.  

4. GENERAL :
(b) No.  (c) Nil.  (v) (a) and (b) N.A.  
(vi and vii) Nil.

5. RESULTS :
(i) 606.1 lb./ac.  
(ii) (a) 137.9 lb./ac.  
(b) 72.72 lb./ac.  
(iii) Main effect of N alone is highly significant  
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>S1</td>
<td>458.2</td>
<td>574.0</td>
<td>626.9</td>
<td>764.6</td>
<td>673.8</td>
<td>619.5</td>
</tr>
<tr>
<td>S2</td>
<td>383.4</td>
<td>501.4</td>
<td>655.7</td>
<td>735.1</td>
<td>688.2</td>
<td>592.7</td>
</tr>
<tr>
<td>Mean</td>
<td>420.8</td>
<td>537.7</td>
<td>641.3</td>
<td>749.8</td>
<td>681.0</td>
<td>606.1</td>
</tr>
</tbody>
</table>

Mean of difference of two  
(1) P, K, S or F marginal means =23.88 lb./ac.  
(2) N marginal means =24.20 lb./ac.  
(3) N means at the same level of P, K, S or F =34.22 lb./ac.  
(4) P, K, S or F means at the same level of N =38.06 lb./ac.
Crop :- Cotton.  
Ref :- Gj. 55(52).  
Type :- 'CM'.


Object :- To find out the response of Cotton to different manurial doses and spacings.

1. BASAL CONDITIONS :
   (i) (a) Jowar—Cotton. (b) Jowar. (c) Nil. (ii) (a) Deep black. (b) Refer soil analysis, Surat. (iii) 27.6.1955. (iv) (a) 2 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 1 seed/dibble. (v) 5 C.L./ac. of F.Y.M. just before harrowing. (vi) Co9=170 (early). (vii) Unirrigated. (viii) 3 weedings, 2 thinnings and 4 interculturings. (ix) 26.98°. (x) 3 pickings on 16.2.1956, 5.3.1956 and 31.3.1956.

2. TREATMENTS and 3. DESIGN :
   Same as in expt. no. 54 (70) on page 306.

4. GENERAL :
   (i) Normal. (ii) Heavy attack of black-arm disease. (iii) Kapas yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 644.4 lb./ac. (ii) (a) 133.3 lb./ac. (b) 75.97 lb./ac. (iii) Main effect of N is significant. Effect of S is highly significant. Interaction N x S is not significant. (iv) Av. yield of kapas in lb./ac,

<table>
<thead>
<tr>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
<th>( N_4 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>503.7</td>
<td>698.1</td>
<td>683.2</td>
<td>795.4</td>
<td>792.8</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>500.4</td>
<td>591.1</td>
<td>526.4</td>
<td>680.0</td>
<td>673.5</td>
</tr>
<tr>
<td>Mean</td>
<td>502.0</td>
<td>644.6</td>
<td>604.8</td>
<td>737.7</td>
<td>733.1</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 68.96 lb./ac.
2. S marginal means = 22.99 lb./ac.
3. S means at the same level of N = 51.42 lb./ac.
4. N means at the same level of S = 77.95 lb./ac.

---

Crop :- Cotton.  
Ref :- Gj. 56(60).  
Type :- 'CM'.


Object :- To find out the response of Cotton to different manurial doses and spacings.

1. BASAL CONDITIONS :
   (i) (a) Cotton—Jowar. (b) Jowar. (c) Nil. (ii) (a) Black soil. (b) Refer soil analysis, Surat. (iii) (a) 2 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 1 seed/dibble. (v) 5 C.L./ac. of F.Y.M. (vi) Co9=170 (early). (vii) Unirrigated. (viii) 3 weedings, 2 thinnings and 4 interculturings. (ix) 41.80°. (x) 3 pickings on 15.2.1957, 7.3.1957. and 19.3.1957.

2. TREATMENTS and 3. DESIGN :
   Same as in expt. no. 54(70) on page 306.

4. GENERAL :
   (i) Normal. (ii) Heavy attack of black-arm disease. (iii) Kapas yield. (iv) (a) 1954—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 511.0 lb./ac.  (ii) (a) 40.73 lb./ac.  (b) 58.47 lb./ac.  (iii) Main effect of N alone is highly significant.

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

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>322.2</td>
<td>561.4</td>
<td>494.6</td>
<td>683.8</td>
<td>637.8</td>
<td>540.7</td>
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<tr>
<td>S₂</td>
<td>269.0</td>
<td>522.5</td>
<td>398.7</td>
<td>615.8</td>
<td>600.3</td>
<td>481.2</td>
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<tr>
<td>Mean</td>
<td>295.6</td>
<td>541.9</td>
<td>446.6</td>
<td>651.8</td>
<td>619.0</td>
<td>511.0</td>
</tr>
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</table>

S.E. of difference of two

1. N marginal means  = 20.36 lb./ac.
2. S marginal means  = 18.48 lb./ac.
3. S means at the same level of N  = 41.35 lb./ac.
4. N means at the same level of S  = 35.63 lb./ac.

Crop :- Cotton.  
Ref :- Gj. 57(110).  
Type :- 'CM'.

Object :- To study the effect of inorganic and organic manures along with spacing and no. of plants per hill on the yield of Cotton.

1. BASAL CONDITIONS:

(i) (a) Cotton—Jowar.  (b) Jowar.  (c) Nil.  (ii) (a) Deep black.  (b) Refer soil analysis, Surat.  (iii) 6.7.1957, redibbled on 18.7.1957.  (iv) (a) N.A.  (b) Dibbling.  (c) 3 to 4 lb./ac.  (d) As per treatments.  (e) N.A.  (v) Nil.  (vi) Cotton—2087.  (vii) Unirrigated.  (viii) 4 interculturings and 2 weedings.  (ix) 33.41'.  (x) 28.3.1958 to 10.4.1958.

2. TREATMENTS:

Main-plot treatments:
All combinations of (1), (2), (3), (4) and (5)
(1) 2 levels of P₂O₅ as Super : P₀ = 0 and P₁ = 30 lb./ac.
(2) 2 levels of K₂O as Pot. sul. : K₀ = 0 and K₁ = 60 lb./ac.
(3) 2 spacings : S₁ = 5' x 2' and S₂ = 5' x 3'.
(4) No. of plants/dibble : D₁ = 1 and D₂ = 2 plants.
(5) 2 levels of F.Y.M. : F₀ = 0 and F₁ = 5 C.L./ac.

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

3. DESIGN:

(i) 25 x 3 split-plot.  (ii) (a) 8 main-plots/block ; 4 blocks/replication and 3 sub-plots/main-plot.  (b) N.A.
(iii) (iv) (a) 25' x 30'.  (b) 15' x 24'.  (v) 5' x 3'.  (vi) Yes.

4. GENERAL:

(i) Poor due to heavy rains.  (ii) Pink boll-worm attack.  (iii) Kapas yield.  (iv) (a) 1957—contd.  (b) N.A.
(c) Nil.  (v) (a) and (b) N.A.  (vi) Drying of bolls before maturity was about 12%.  (vii) Nil.

5. RESULTS:

(i) 211 lb./ac.  (ii) (a) 77.68 lb./ac.  (b) 48.57 lb./ac.  (iii) Main effect of N and interaction N x D are highly significant. Interactions P x D and K x F are significant. No other effect is significant.  (iv) Mean and differential responses in lb./ac.

Differential response

<table>
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<tr>
<th>Mean response</th>
<th>P</th>
<th>K</th>
<th>S</th>
<th>D</th>
<th>F</th>
</tr>
</thead>
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<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>P</td>
<td>3.78</td>
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</tr>
<tr>
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<tr>
<td>S</td>
<td>27.37</td>
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<td>12.35</td>
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<td>8.41</td>
<td>-4.69</td>
<td>-36.20</td>
<td>39.92</td>
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</tbody>
</table>
Crop :- Cotton.

Object :- To study the effect of inorganic and organic manures along with spacing and no. of plants per hill on the yield of Cotton.

1. BASAL CONDITIONS :
(i) (a) Cotton—Jowar. (b) Jowar. (c) Nil. (ii) (a) Deep black. (b) Refer soil analysis, Surat. (iii) 24 and 25.6.1958. (iv) (a) N.A. (b) Dibbling. (c) 3 to 4 lb./ac. (d) As per treatments. (e) N.A. (f) Cotton—2087. (g) Unirrigated. (h) 6 interculturings and 3 weedings. (ix) 44.81". (x) 6.4.1959 and 9.4.1959.

2. TREATMENTS and 3. DESIGN :
Same as in exp. no. 57(110) on page 308.

4. GENERAL :
(i) Poor due to heavy rains. (ii) Boll-worm attack. (iii) Kapas yield. (iv) (a) 1957—contd. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 347 lb./ac. (ii) (a) 109.7 lb./ac. (b) 75.64 lb./ac. (iii) Interactions P × S and S × F are significant. No other effect is significant. (iv) Mean and differential responses in lb./ac.

<table>
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<th>Differential response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean response</td>
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<tr>
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<tr>
<td>S</td>
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<td>D</td>
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<td>F</td>
</tr>
</tbody>
</table>

S.E. of mean response = 15.86 lb./ac.
S.E. of differential response = 22.42 lb./ac.
Crop: Cotton.

Object: To study the effect of inorganic and organic manures along with spacing and no. of plants per hill on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Cotton—Jowar. (b) Jowar (Kharif) and Tur (Rabi).
   (c) Nil. (ii) (a) Deep black. (b) Refer soil analysis, Surat.
   (iii) 30.6.1959; redilled on 9.7.1959. (iv) (a) N.A. (b) Dibbling.
   (c) 3 to 4 lb./ac. (d) As per treatments. (e) N.A. (v) Nil.
   (vi) 2087 (Vijalpa). (vii) Unirrigated. (viii) 1 weeding and 1 interculturing.
   (ix) 70.77. (x) 10.4.1960.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 57(110) on page 308.

4. GENERAL:
   (i) Poor. (ii) Nil. (iii) Kapas yield. (iv) (a) 1957—contd. (b) No. (c) Nil.
   (v) (a) and (b) N.A. (vi) Flood waters from river Tapti entered the exptl. area and hence much damage was done to crop. (vii) Nil.

5. RESULTS:
   (i) 366 lb./ac. (ii) (a) 82.04 lb./ac. (b) 86.52 lb./ac. (iii) Main effect of N is highly significant. Interaction K×D is significant. No other effect is significant. (iv) Mean and differential responses in lb./ac.

Differential response

<table>
<thead>
<tr>
<th>Mean</th>
<th>P</th>
<th>K</th>
<th>S</th>
<th>D</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>−24.45</td>
<td>45.23</td>
<td>−21.53</td>
<td>43.46</td>
<td>−20.97</td>
</tr>
<tr>
<td>P</td>
<td>16.54</td>
<td>−12.15</td>
<td>25.00</td>
<td>−49.48</td>
<td>−32.67</td>
</tr>
<tr>
<td>S</td>
<td>−2.97</td>
<td>0.76</td>
<td>−6.70</td>
<td>−48.49</td>
<td>−9.27</td>
</tr>
<tr>
<td>D</td>
<td>−20.97</td>
<td>−13.05</td>
<td>−24.80</td>
<td>−17.14</td>
<td>−19.81</td>
</tr>
<tr>
<td>F</td>
<td>−28.18</td>
<td>−32.37</td>
<td>−29.89</td>
<td>−22.13</td>
<td>−23.69</td>
</tr>
<tr>
<td>Mean</td>
<td>−16.75</td>
<td>20.37</td>
<td>−9.27</td>
<td>−12.15</td>
<td>−16.53</td>
</tr>
</tbody>
</table>

S.E. of mean response =16.75 lb./ac.  
S.E. of differential response =23.69 lb./ac.

Object: To study the effect of inorganic and organic manures along with spacing and no. of plants per hill on the yield of Cotton.

1. N marginal means =18.91 lb./ac.
2. N means at the same level of P, K, S, D or F =26.74 lb./ac.
3. P, K, S, D or F means at the same level of N =31.27 lb./ac.
311

S.E. of difference of two

1. N marginal means =-21.63 lb./ac.
2. N means at the same level of P, K, S, D or F =30.59 lb./ac.
3. P, K, S, D or F means at the same level of N =30.07 lb./ac.

Crop :- Cotton (Kharif).
Ref :- Gj. 58(94).
Type :- 'CM'.

Object :- To ascertain the optimum spacing and combination of different fertilizers for Cotton.

1 BASEAL CONDITIONS :
(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 16.7.1958.
(iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) N.A. (d) As per treatments. (e) N.A. (v) Nil.

2. TREATMENTS:
Main-plot treatments :
3 spacings between rows : S1=18", S2=27" and S3=36".
Sub-plot treatments :
2 spacings between plants after thinning : R1=6" and R2=9".

Sub-sub-plot treatments :
M0=0, M1=20 lb./ac. of N+10 lb./ac. of P2O5 and M2=40 lb./ac. of N+20 lb./ac. of P2O5.
N as A/S and P2O5 as Super applied in furrows at sowing.

3. DESIGN :
(i) Split-split-plot. (ii) 3 main-plots/replication, 2 sub-plots/main-plot; 3 sub-sub-plots/sub-plot. (b) N.A.
(iii) 5. (iv) (a) 24' x 30' for S1 and S2, 22.5' x 30' for S3. (b) 18' x 24'. (v) N.A. (vi) Yes.

4. GENERAL :
(i) Normal. (ii) Nil. (iii) Kapas yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A.
(vi) and (vii) Nil.

5. RESULTS :
(i) 884 lb./ac. (ii) (a) 141.9 lb./ac. (b) 78.15 lb./ac. (c) 79.12 lb./ac. (iii) None of the effects is significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>840</td>
<td>915</td>
<td>895</td>
<td>884</td>
<td>855</td>
<td>888</td>
</tr>
<tr>
<td>R2</td>
<td>871</td>
<td>908</td>
<td>874</td>
<td>884</td>
<td>868</td>
<td>878</td>
</tr>
<tr>
<td>Mean</td>
<td>856</td>
<td>912</td>
<td>884</td>
<td>884</td>
<td>862</td>
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</tr>
<tr>
<td>M0</td>
<td>793</td>
<td>916</td>
<td>876</td>
<td>884</td>
<td></td>
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<tr>
<td>M1</td>
<td>870</td>
<td>908</td>
<td>871</td>
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<td>884</td>
</tr>
<tr>
<td>M2</td>
<td>905</td>
<td>909</td>
<td>907</td>
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<td></td>
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</tbody>
</table>

S.E. of difference of two

1. S marginal means =47.29 lb./ac. 6. R means at the same level of M =37.14 lb./ac.
2. R marginal means =21.27 lb./ac. 7. S means at the same level of M =60.23 lb./ac.
3. M marginal means =26.37 lb./ac. 8. R means at the same level of S =36.84 lb./ac.
4. M means at the same level of R =37.29 lb./ac. 9. S means at the same level of R =53.99 lb./ac.
5. M means at the same level of S =45.68 lb./ac.
Crop :- Cotton (Kharif).


Ref :- Gj. 59(104).

Type :- 'CM'.

Object :- To ascertain the optimum spacing and combination of different fertilizers for Cotton.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 8.7.1959.

(iv) (a) 1 ploughing and 2 harrowings. (b) Drilling. (c) 15 lb./ac. (d) As per treatments. (e) N.A.


2. TREATMENTS :

Main-plot treatments :

3 spacings between rows : S₁ =18", S₂ =36", S₃ =54".

Sub-plot treatments :

2 spacings between plants : R₁ =6" and R₂ =9".

Sub-sub-plot treatments :

M₀ =0, M₁ =20 lb./ac. of N+10 lb./ac. of P₂O₅, M₂ =40 lb./ac. of N+20 lb./ac. of P₂O₅.

N as A/S and P₂O₅ as Super applied in furrows at sowing.

3. DESIGN :

(i) Split-split-plot. (ii) (a) 3 main-plots/replication, 2 sub-plots/main-plot; 3 sub-sub-plots/sub-plot. (b) N.A.

(iii) 3. (iv) (a) 24'×30'. (b) 18'×24'. (v) 3'×3'. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Kapas yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A.

(vi) and (vii) Nil.

5. RESULTS :

(i) 393 lb./ac. (ii) (a) 203.4 lb./ac. (b) 69.49 lb./ac. (c) 120.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
</tr>
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<td>R₁</td>
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<td>434</td>
<td>334</td>
<td>414</td>
<td>411</td>
<td>392</td>
</tr>
<tr>
<td>R₂</td>
<td>384</td>
<td>380</td>
<td>348</td>
<td>371</td>
<td>392</td>
<td>416</td>
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<tr>
<td>Mean</td>
<td>429</td>
<td>408</td>
<td>341</td>
<td>393</td>
<td>352</td>
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<table>
<thead>
<tr>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
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<tbody>
<tr>
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<td>232</td>
<td>449</td>
<td>439</td>
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<td>M₁</td>
<td>408</td>
<td>417</td>
<td>387</td>
<td>371</td>
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<tr>
<td>M₂</td>
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<td>428</td>
<td>404</td>
<td>393</td>
<td>352</td>
<td>404</td>
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</tr>
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</table>

S.E. of difference of two

1. S marginal means =67.80 lb./ac.

2. R marginal means =18.91 lb./ac.

3. M marginal means =40.00 lb./ac.

4. M means at the same level of R =56.57 lb./ac.

5. M means at the same level of S =69.28 lb./ac.

6. R means at the same level of M =49.90 lb./ac.

7. S means at the same level of M =88.29 lb./ac.

8. R means at the same level of S =32.76 lb./ac.

9. S means at the same level of R =71.64 lb./ac.

Crop :- Cotton.

Site :- Agri. Res. Stn., Viramgam.

Ref :- Gj. 54(75).

Type :- 'CM'.

Object :- To determine the optimum spacing and manurial requirements of Cotton.

1. BASAL CONDITIONS :

(i) (a) Cotton—Jowar. (b) Jowar. (c) Nil. (ii) (a) Alluvial. (b) Refer soil analysis, Viramgam. (iii) 8 and 9th July 1954.

(iv) (a) 1 harrowing. (b) Drilling. (c) 15 lb./ac. (d) As per treatments. (e) N.A. (v) 5 C.I./ac. of F.Y.M. evenly distributed in the middle of June.

2. TREATMENTS:

Main-plot treatments:

All combinations of (1), (2) and (3)

(1) 2 levels of \(P_{205}\) as Super: \(P_0 = 0\) and \(P_1 = 20\) lb./ac.

(2) 2 levels of F.Y.M. as Super: \(F_0 = 0\) and \(F_1 = 5\) C.L./ac.

(3) 4 levels of N as A/S: \(N_0 = 0\), \(N_1 = 10\) and \(N_2 = 20\) lb./ac. in two equal doses and \(N_3 = 20\) lb./ac. in a single dose.

Sub-plot treatments:

3 spacings between rows: \(S_1 = 18^\prime\), \(S_2 = 24^\prime\) and \(S_3 = 30^\prime\).


3. DESIGN:

(i) Split-plot. (ii) (a) 16 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 40' \( \times \) 15', 40' \( \times \) 16' and 40' \( \times \) 15' for \(S_1\), \(S_2\) and \(S_3\) respectively. (b) 30' \( \times \) 12', 30' \( \times \) 12' and 36' \( \times \) 10' for \(S_1\), \(S_2\) and \(S_3\) respectively. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Extremely good. (ii) Slight attack of leaf-spot and jassids. (iii) N.A. (iv) (a) 1954—contd. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1565 lb./ac. (ii) (a) 381.5 lb./ac. (b) 18v.5 lb./ac. (iii) Main effect of \(S\) is highly significant. Interaction \(P \times F\) is significant. Other effects are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>(N_0)</th>
<th>(N_1)</th>
<th>(N_2)</th>
<th>(N_3)</th>
<th>(F_0)</th>
<th>(F_1)</th>
<th>(S_1)</th>
<th>(S_2)</th>
<th>(S_3)</th>
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</tr>
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<td>1545</td>
<td>1573</td>
<td>1527</td>
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<tr>
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<td>1637</td>
<td>1507</td>
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<td>1630</td>
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<td>1566</td>
<td>1583</td>
<td>1577</td>
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<td>1600</td>
<td>1631</td>
<td>1465</td>
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<td>1637</td>
<td>1612</td>
<td>1609</td>
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<td>1566</td>
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<tr>
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<tr>
<td>F_0</td>
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<td>1517</td>
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</tr>
<tr>
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<td>1506</td>
<td>1557</td>
<td>1576</td>
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<td></td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>S.E. of difference of two</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (P) or (F) marginal means = 63.58 lb./ac.</td>
</tr>
<tr>
<td>2. (N) marginal means = 89.92 lb./ac.</td>
</tr>
<tr>
<td>3. (S) marginal means = 37.05 lb./ac.</td>
</tr>
<tr>
<td>4. (S) means at the same level of (P) or (F) = 52.40 lb./ac.</td>
</tr>
<tr>
<td>5. (S) means at the same level of (N) = 74.10 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).

Site :- Agri. Res. Stn., Viramgam.

Ref :- Gj. 55(62).

Type :- 'CM'.

Object :- To determine the optimum spacing and manural requirements of Cotton.

1. BASAL CONDITIONS:

(i) (a) Cotton—Jowar—Cotton. (b) Jowar. (c) Nil. (ii) (a) Alluvial (medium black). (b) Refer soil analysis, Viramgam. (iii) 5.7.1955. (iv) (a) 4 harrowings. (b) Drilling. (c) 12 lb./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) Kalyan (early). (vii) Unirrigated. (viii) Gap filling, 2 interculturings and 2 weedings. (ix) 20.18'. (x) 6.3.1956 and 22.3.1956.
2. TREATMENTS:
Same as in expt. no. 54(75) on page 312.

3. DESIGN:
(i) Split-plot.  
   (ii) (a) 6 main-plots/block, 3 sub-plots/main-plot.  
   (b) N.A.  
   (iii) 3.  
   (iv) (a) 46' × 40' (main), 15' × 40' (S₁ and S₂), 16' × 40' (S₃) (sub).  
   (b) 34' × 36', (main) 12' × 30' (S₁ and S₂), 10' × 36' (S₃) (sub).  
   (v) 1 guard row on either side of each sub-plot.  
   (vi) Yes.

4. GENERAL:
(i) Below normal.  
   (ii) Angular leaf-spots.  
   (iii) Damage negligible.  
   (iv) (a) 1954—contd.  
   (b) No.  
   (c) N.A.  
   (v) (a) and (b) N.A.  
   (vi) and (vii) Nil.

5. RESULTS:
(i) 1252 lb./ac.  
   (ii) (a) 250.8 lb./ac.  
   (b) 169.7 lb./ac.  
   (iii) Only main effect of P is significant.  
   (iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
<th></th>
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<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>F₁</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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<td>1304</td>
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<td>1256</td>
<td>1301</td>
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<td>1233</td>
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</tr>
</tbody>
</table>

S.E. of difference of two means at a level of  
1. P or F marginal means = 41.80 lb./ac.  
2. N marginal means = 59.11 lb./ac.  
3. S marginal means = 34.64 lb./ac.  
4. S.E. of body of P × F table = 48.99 lb./ac.  
5. S.E. of body of P × N or F × N table = 59.11 lb./ac.

Crop: Cotton (Kharif).  
Ref: Gj. 57(98).  
Type: 'CM'.

Object: To determine the optimum spacing and manural requirements of Cotton.

1. BASAL CONDITIONS:
(i) (a) Cotton—Jowar.  
   (b) Jowar.  
   (c) Nil.  
   (ii) (a) Alluvial (medium black).  
   (b) Refer soil analysis, Viramgam.  
   (iii) 2.7.1957.  
   (iv) (a) 4 harrowings.  
   (b) Drilling.  
   (c) 12 lb./ac.  
   (d) As per treatments.  
   (e) N.A.  
   (f) Nil.  
   (vi) Kalyan (early).  
   (vii) Unirrigated.  
   (viii) 3 interculturings.  
   (ix) 13.01-.  
   (x) 13.3.1958.

2. TREATMENTS:
Same as in expt. no. 54(75) on page 312.

3. DESIGN:
Same as in expt. no. 55(62) on page 313.

4. GENERAL:
(i) Poor due to weeds.  
   (ii) Nil.  
   (iii) Kapas yield.  
   (iv) (a) 1954—contd.  
   (b) No.  
   (c) N.A.  
   (v) (a) and (b) N.A.  
   (vi) and (vii) Nil.
5. RESULTS:
(i) 504 lb./ac. (ii) (a) 171.4 lb./ac. (b) 99.7 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
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<td>435</td>
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</tr>
</tbody>
</table>

S.E. of difference of two
1. P or F marginal means = 28.57 lb./ac. 2. N marginal means = 40.40 lb./ac. 3. S marginal means = 20.35 lb./ac. 4. S means at a level of P or F = 28.78 lb./ac. S.E. of body of P×N or F×N table = 40.71 lb./ac.

Crop :- Cotton (Kharif).
Site :- Trial-cum-Demonstration Farm, Bardoli.
Type :- 'T'.

Objecct :- To find out the optimum dose of irrigation required for Cotton.

1. BASAL CONDITIONS :
(i) (a) Cotton—Jowar. (b) Jowar, Paddy and Wafr. (c) 300 lb./ac. of G.N.C. + 100 lb./ac. of A/S + 100 lb./ac. of Super. (ii) (a) Deep black soil. (b) Refer soil analysis, Bardoli. (iii) 23.6.1959. (iv) (a) Four harrowings and 1 ploughing. (b) Dibbling. (c) N.A. (d) 6'×2'. (e) 2 to 3. (v) 10 C.L.fac. of F.Y.M. applied in furrows on 26.6.1959. (vi) Cotton—2087. (vii) As per treatments. (viii) Four interculturings and 2 weedings. (ix) 100°. (x) 10.3.1960.

2. TREATMENTS :
1. Control (no irrigation).
2. Irrigation every two weeks.
3. Irrigation every three weeks.
4. Irrigation every four weeks.

3. DESIGN :
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 54'×40'. (b) 42'×26'. (v) 6'×7'. (vi) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Kapas yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 640 lb./ac. (ii) 197.7 bl./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
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<th>Treatment</th>
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<tr>
<td>Av. yield</td>
<td>571</td>
<td>708</td>
<td>622</td>
<td>658</td>
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</table>

S.E./mean = 88.4 lb./ac.
Crop :- Cotton (Kharif).


Object :- To find out suitable number of irrigations for maximum yield of Cotton.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 18.7.1954.
   (iv) (a) Two harrowings and two interculturings and weedings etc. (b) Drilling. (c) 10 lb./ac. (d) 3' distance between rows.

2. TREATMENTS :
   4 levels of irrigations:  I₀=0, I₁=1, I₂=2 and I₃=3 irrigations.

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 66'×24'. (b) 60'×18'. (v) One row along length and 3' along breadth. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) Attack of red leaf disease, Jasides and aphids at boll formation stage. (iii) Height of plant, total no. of bolls/plant and kapas yield. (iv) (a) 1954 — N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 404.8 lb./ac. (ii) 41.54 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
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<th>I₂</th>
<th>I₃</th>
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<tr>
<td>Av. yield</td>
<td>422.2</td>
<td>420.4</td>
<td>395.3</td>
<td>381.4</td>
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<tr>
<td>S.E./mean</td>
<td>16.94 lb./ac.</td>
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</table>

---

Crop :- Cotton (Kharif).


Object :- To find out the economical number of irrigations for Cotton.

1. BASAL CONDITIONS :
   (i) (i) Nil. (b) Sann. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 23.7.1955.
   (iv) (a) 1 ploughing and 3 harrowings. (b) Drilling. (c) 10 lb./ac. (d) 3'×9' to 12'. (e) N.A. (v) Super broadcast and castorcake top dressed ; amount N.A. (vi) Co₂—170. (vii) As per treatments. (viii) 6. interculturings. (ix) 13.75'. (x) 15.3.1956 and 30.3.1956.

2. TREATMENTS :
   3 levels of irrigation : I₀=0, I₁=1 and I₂=2 irrigations.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 51'×18'. (b) 45'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Kapas yield. (iv) 1954 (modified in 1955)—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 529 lb./ac. (ii) 126.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
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<th>I₂</th>
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<td>Av. yield</td>
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<td>526</td>
<td>522</td>
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<tr>
<td>S.E./mean</td>
<td>51.6 lb./ac.</td>
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Object: To assess the best interval and number of irrigations for Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 12.7.1955. (iv) (a) One ploughing. (b) Drilling. (c) 10 lb./ac. (d) N.A. (e) —. (v) Nil. (vi) Co₂—170. (vii) As per treatments. (viii) Three interculturings and 4 weedings. (ix) About 34°. (x) 11.2.1960.

2. TREATMENTS:
   1. Control (no irrigation).
   2. Irrigation at 14 days interval.
   3. 5 irrigations at 21 days interval.
   4. 3 irrigations at 28 days interval.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 50'×18'. (b) 44'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Light attack of grass hoppers, flies, aphids and Jassids and spraying of Endrine. (iii) Kapas yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (vi) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 332 lb./ac. (ii) 48.3 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac. Treatment

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</table>
   Av. yield | 331 | 317 | 369 | 311 |
   S.E./mean  = | 19.7 lb./ac. |

---

Crop: Cotton (Kharif).
Ref: Gj. 58(28).
Type: T'

Object: To assess the best interval and number of irrigations for Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton. (b) Wheat. (c) 200 lb./ac. of Super+200 lb./ac. of A/S+200 lb./ac. of manure mixture. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 16.7.1958. (iv) (a) 2 ploughings and 2 harrowings. (b) Drilling. (c) 5 lb./ac. (d) 3' between rows. (e) —. (v) Nil. (vi) Co₂—170. (vii) As per treatments. (viii) 4 interculturings and 2 weedings. (ix) About 13°. (x) 31.1.1959.

2. TREATMENTS:
   Same as in exp. no. 57(15) above.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 51'×18'. (b) 45'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Attack of black-arm and shoot-borer. (iii) Kapas yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (vi) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 711 lb./ac. (ii) 87.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac. Treatment

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</table>
   Av. yield | 571 | 771 | 734 | 769 |
   S.E./mean  = | 35.8 lb./ac. |

---
Crop :- Cotton. Ref :- Gj. 59(72).
Site :- Trial-cum-Demonstration Farm, Kholwad. Type :- 'I'.

Object :- To find out the optimum time and no. of irrigations for Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar, spices and wheat. (c) Jowar and wheat received 40 lb./ac. of N+20 lb./ac. of P₂O₅.
   (ii) (a) Medium black. (b) N.A. (iii) 26.6.1959. (iv) (a) 1 harrowing. (b) Dibbling. (c) 3 seeds dibble.
   (d) 6' × 2'. (e) —. (v) 5 C.L. fac. of F.Y.M. on 20.6.1959 and 40 lb./ac. of N as A/S on 7.10.1959 and 30.11.1959.
   (vi) Cotton — 2087. (vii) As per treatments. (viii) 6 interculturings and 4 weedings. (ix) 106.6'. (x) N.A.

2. TREATMENTS:
   1. Control (no irrigation).
   2. Irrigation every two weeks (5 irrigations).
   3. Irrigation every three weeks (4 irrigations).
   4. Irrigation every four weeks (3 irrigations).
   Intensity of irrigation is 2.5 acre inches in each case.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 54' × 40'. (b) 42' × 26'. (v) 6' × 7'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) N.A. (iv) 1959—contd. (b) and (c) N.A. (v) The results of the exp. are not satisfactory as the crop was affected by heavy rain and Tapti flood water. (vi) Nil.

5. RESULTS:
   (i) 557 lb./ac. (ii) 68.2 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
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<th>Treatment</th>
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<tr>
<td>Av. yield</td>
<td>469</td>
<td>609</td>
<td>536</td>
<td>612</td>
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<tr>
<td>S.E./mean</td>
<td>=30.5 lb./ac.</td>
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</table>
**Crop:** Cotton *(Kharif).*

**Site:** Agri. Res. Stn., Umrala.

**Ref:** Gj. 57(75).

**Object:** To study the effect of irrigation on yield of Cotton.

1. **BASAL CONDITIONS**:
   - (i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 28.6.1957. (iv) (a) 1 tractor ploughing and 2 harrowings. (b) to (e) N.A. (vi) 20 lb./ac. of N as A.F.S. (vii) Pratap (medium). (viii) As per treatments. (ix) 34". (x) 15.12.1957.

2. **TREATMENTS**:
   - Same as in expt. no. 56(92) on page 318.

3. **DESIGN**:
   - (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 48'x24'. (b) 42'x18'. (v) 3'x3'. (vi) Yes.

4. **GENERAL**:
   - (i) Good. (ii) Boll worm attack. (iii) Kapas yield. (iv) (a) 1956-1957. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   - (i) 720 lb./ac. (ii) 65.97 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of *kapas* in lb./ac.

<table>
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<tr>
<td>Av. yield</td>
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<td>740</td>
<td>775</td>
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<tr>
<td>S.E./mean</td>
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<td>26.93</td>
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**Crop:** Cotton *(Kharif).*

**Site:** Central Expt. Stn., Junagadh.

**Ref:** Gj. 58(102).

**Object:** To study the effect of irrigation on different varieties of Cotton.

1. **BASAL CONDITIONS**:
   - (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 13.7.1958. (iv) (a) 1 ploughing and 2 harrowings. (b) Dibbling. (c) 5 lb./ac. (d) 3'x2'. (e) 3 to 4 seeds/dibble. (v) 5 C.L./ac. of F.Y.M. (vi) and (vii) As per treatments. (viii) 2 interculturings. (ix) 33.27". (x) 1.2.1959 and 20.4.1959.

2. **TREATMENTS**:
   - **Main-plot treatments:**
     - 4 levels of irrigation: I_0=0, I_1=2, I_2=4 and I_3=6 irrigations.
   - **Sub-plot treatments:**
     - 3 varieties: V_1=CO_2—170, V_2=Kalyan and V_3=CI—73.

3. **DESIGN**:
   - (i) Split-plot. (ii) (a) 4 main-plots/replication; 3 sub-plots/main-plot. (b) 72'x54'. (iii) 4. (iv) (a) 18'x18'. (b) 14'x12'. (v) 2'x3'. (vi) Yes.

4. **GENERAL**
   - (i) N.A. (ii) Nil. (iii) Kapas yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:
   - (i) 1310 lb./ac. (ii) (a) 159.6 lb./ac. (b) 627.5 lb./ac. (iii) Main effects of I and V are highly significant. Interaction I X V is not significant. (iv) Av. yield of *kapas* in lb./ac.
Crop :- Cotton *(Kharif)*.

Site :- Central Expt. Stn., Junagadh.

Object :- To study the effect of irrigation on different varieties of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 4.7.1959. (iv) (a) One ploughing and two harrowings. (b) Dibbling. (c) 3' x 2'. (d) 3 to 4 seed/dibble. (e) 5 C.L. ac. of F.Y.M. (vi, and (vii) As per treatments. (viii) Nil. (ix) 57.54'. (x) 20.5.1960.

2. TREATMENTS :
   Same as in expt. no. 58(102) on page 319.

3. DESIGN :
   (i) Split-plot. (ii) (a) 4 main-plots/replication ; 3 sub-plots/main-plot. (b) 72' x 54'. (iii) 4. (iv) (a) 18' x 18'. (b) 14' x 12'. (c) 2' x 3'. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii; Kapas yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 263 lb./ac. (ii) (a) 67.5 lb./ac. (b) 34.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of Kapas in lb./ac.

<table>
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<th>V3</th>
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<td>259</td>
<td>251</td>
<td>258</td>
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<tr>
<td>I1</td>
<td>292</td>
<td>259</td>
<td>247</td>
<td>266</td>
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<tr>
<td>I2</td>
<td>255</td>
<td>255</td>
<td>267</td>
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<td>I3</td>
<td>288</td>
<td>284</td>
<td>240</td>
<td>270</td>
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</tbody>
</table>

| Mean | 275 | 264 | 251 |

S.E. of difference of two
1. I marginal means = 27.6 lb./ac.
2. V marginal means = 12.0 lb./ac.
3. V means at the same level of I = 17.0 lb./ac.
4. I means at the same level of V = 33.8 lb./ac.
Crop :- Cotton.  
Site:- Central Expt. Stn., Junagadh.  

Object :- To study the effect of irrigation, time of sowing spacing and Nitrogen on Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) and (e) N.A.  (ii) (a) Medium black.  (b) Refer soil analysis, Junagadh.  (iii) As per treatments.  (iv) (a) 1 ploughing and 2 harrowing.  (b) Dibbling.  (c) 5 lb./ac.  (d) 3' between rows.  (e) 3-4 seeds/dibble; thinned to one plant/hill.  (v) 5'C.L.fac. of F.Y.M.  (vi) Co₂=170.  (vii) As per treatments.  (viii) Two interculturings.  (ix) N.A.  (x) 22.2.1959 and 11.4.1959.

2. TREATMENTS:
Main-plot treatments:
3 levels of irrigation: I₁ =2, I₂ =3 and I₃ =4 irrigations.

Sub-plot treatments:

Sub-sub-plot treatments:
3 spacings: S₁ =9", S₂ =18" and S₃ =27".

Sub-sub-sub-plot treatments:
3 levels of N: N₁ =0, N₂ =20 and N₃ =40 lb./ac.

3. DESIGN:
(i) Split-plot.  (ii) (a) 3 main-plots/replication; 3 sub-plots/main-plot; 3 sub-sub-plots/sub-plot; 3 sub-sub-sub-plots/sub-sub-plot.  (b) N.A.  (iii) 2.  (iv) (a) 27"x18'.  (b) 22.5'x12'.  (v) 2.25'x3'.  (vi) Yes.

4. GENERAL:
(i) and (ii) N.A.  (iii) Kapas yield.  (iv) (a) 1958–1960.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 816 lb./ac.  (ii) (a) 219.2 lb./ac.  (b) 338.8 lb./ac.  (c) 157.6 lb./ac.  (d) 145.3 lb./ac.  (iii) Only I, D and S effects are significant. Other effects are not significant.  (iv) Av. yield of kapas in lb./ac.

<table>
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<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
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<th>S₁</th>
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S.E. of difference of two
1. I marginal means = 42.18 lb./ac.  9. N means at the same level of S = 48.43 lb./ac.
2. D marginal means = 65.20 lb./ac.  10. S means at the same level of N = 49.84 lb./ac.
3. S marginal means = 30.33 lb./ac.  11. S means at the same level of I = 52.53 lb./ac.
4. N marginal means = 27.96 lb./ac.  12. S means at the same level of S = 60.16 lb./ac.
5. N means at the same level of I = 48.43 lb./ac.  13. S means at the same level of D = 52.53 lb./ac.
6. I means at the same level of N = 57.82 lb./ac.  14. D means at the same level of S = 78.05 lb./ac.
7. N means at the same level of D = 48.43 lb./ac.  15. D means at the same level of I = 112.93 lb./ac.
8. D means at the same level of N = 76.26 lb./ac.  16. I means at the same level of D=101.40 lb./ac.
Crop :- Nagli (Kharif).

Site :- Agri. Res. Stn., Waghai.

Object :- To study the effect of ZnSO$_4$ on the yield of Nagli.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Paddy. (c) Nil. (ii) (a) Light with reddish colour. (b) N.A. (iii) 27.6.1956, transplanting on 2, 3.8.1956. (iv) (a) N.A. (b) Hand sowing, transplanting. (c) - (d) 1'x1'. (e) 1. (v) Nil. (vi) Nagli-B-11. (vii) Unirrigated. (viii) 3 weeding. (ix) 108.69'. (x) 16.11.1956.

2. TREATMENTS:
   Same as in exp. no. 55(68) on page 221.

3. DESIGN:
   (i) R.B.D. Fact. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 18'x33'. (b) 12'x24'. (v) 3' alround. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Yield data. (iv) (a) 1955—1957. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1359 lb./ac. (ii) 241.1 lb./ac. (iii) Only M effect is highly significant. (iv) Av. yield of grain in lb./ac.

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S.E. of M marginal mean = 69.6 lb./ac.
S.E. of Z marginal mean = 56.8 lb./ac.
S.E. of body of table = 98.4 lb./ac.

Crop :- Nagli (Kharif).

Site :- Agri. Res. Stn., Waghai.

Object :- To study the effect of ZnSO$_4$ on the yield of Nagli.

Ref :- Gj. 56(82).

Type :- 'M'.

Crop :- Nagli (Kharif).

Site :- Agri. Res. Stn., Waghai.

Object :- To study the effect of ZnSO$_4$ on the yield of Nagli.

Ref :- Gj. 57(103).

Type :- 'M'.

Object :- To study the effect of ZnSO$_4$ on the yield of Nagli.
1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Light with reddish colour. (b) N.A. (iii) 23.6.1957 and 13.7.1957.

(iv) (a) 1 ploughing and 1 puddling. (b) Hand sowing, transplanting. (c) -

(v) Nil. (vi) Nagli—B-11. (vii) Unirrigated. (viii) 1 interculturing and 1 weeding. (ix) 45.7%.

2. TREATMENTS:

Same as in exp. no. 55(68) on page 221.

3. DESIGN:

(i) R.B.D. Fact. (ii) 6. (b) N.A. (iii) 6. (iv) (a) 18'x30'. (b) 12'x24'. (v) 3'x3'. (vi) Yes.

4. GENERAL:

(i) Due to lack of sufficient rains growth was not satisfactory. (ii) Nil. (iii) Yield data. (iv) 1955—1957.

5. RESULTS:

(i) 1032 lb./ac. (ii) 122.3 lb./ac. (iii) Only M effect is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
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S.E. of M marginal mean
S.E. of Z marginal mean
S.E. of body of table

Crop :- Nagli (Kharif).
Site :- Agri. Res. Stn., Dohad.

Object :- To study the effect of two different methods of cultivation on the yield of Nagli.

Ref :- Gj. 56(22).
Type :- 'CM'.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Maize. (c) 150 seers/acre of G.N.C. (ii) (a) Medium brown. (b) Refer soil analysis, Dohad.

(iii) 17.8.1955. (iv) (a) Preparatory tillage by local plough. (b) Transplanting. (c) —. (d) 12" between rows and 6" between plants. (e) As per treatments. (v) As per treatments. (vi) Nagli (local). (vii) Unirrigated. (viii) 1 interculturing. (ix) 32.50%.

2. TREATMENTS:

2 methods of cultivation :

(1) Departmental method : Basal dose—3 C.L./acre of F.Y.M. Seed rate—1 seedling/bunch. N at 40 lb./acre, applied in two doses and P₂O₅ at 20 lb./acre, applied in one dose.

(2) Local method : Seed rate—2 to 3 seedlings/bunch.

3. DESIGN:

(i) R.B.D. (ii) 2. (b) N.A. (iii) 12. (iv) (a) 18'x30'. (b) 12'x24'. (v) 3' around the net plot. (vi) Yes.

4. GENERAL:

(i) The germination and general growth of the crop was normal. No seasonal abnormalities were observed.

(ii) Nil. (iii) Grain yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) OK Khakhaba, Karjat, Vadgaon and Waghai. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1074 lb./ac. (ii) 309.3 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
Object:—To study the effect of harmones on the growth and yield of Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 22.6.1958. (iv) (a) Dibbling. (b) 5 lb./ac. (d) 5’x2’. (e) 5-6 seeds/dibble. (v) 20 lb./ac. of N as A/S on 8.9.1956. (vi) 2087 (Vj5alpa). (vii) Unirrigated. (viii) 4 interculturings, 4 weedings and 1 thinning. (ix) 44.81’. (x) 7.4.1959.

2. TREATMENTS:

Same as in expt. no. 57(71) on page 323.


3. DESIGN:

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 32’x25’. (b) 20’x15’. (v) 6’x5’. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Boll-worm attack up to 20%. (iii) Kapas yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 463 lb./ac. (ii) 67.23 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of kapas in lb./ac.

---

### Control

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S.E. of S or C marginal mean = 20.6 lb./ac.
S.E. of D marginal mean = 25.2 lb./ac.
S.E. of control mean or body of SxD or CxD table = 35.7 lb./ac.
S.E. of body of SxC table = 29.1 lb./ac.
Crop: Cotton (Kharif).


Object: To study the effect of hormones on the growth and yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar—Tur. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 26.6.1959. (iv) (a) Nil. (b) Dibbling. (c) 5-6 lbs/ac. (d) 5’x2’. (e) 5-6 seeds/ac. (v) Nil. (vi) 2087 (Vijalpa). (vii) Unirrigated. (viii) 1 weeding and 1 interculturing. (ix) 70.77°. (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 57(71) on page 323. Hormones sprayed on 20.8.1959 and 11.9.1959.

3. DESIGN:
   (i) R.B.D. (ii) (a) 14. (b) 64’x72’. (iii) 4. (iv) (a) 32’x25’. (b) 20’x15’. (v) 6’x5’. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Kapas yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 531 lb./ac. (ii) 54.60 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of kapas in lb./ac.

   \[
   \begin{array}{c|ccc|cc}
   & D_1 & D_2 & D_3 & C_1 & C_2 \\
   S_1 & 509 & 540 & 533 & 514 & 540 \\
   S_2 & 540 & 514 & 429 & 528 & 536 \\
   Mean & 525 & 527 & 531 & 528 & 530 \\
   C_1 & 519 & 533 & 524 & & \\
   C_2 & 530 & 521 & 538 & & \\
   \end{array}
   \]

   S.E. of S or C marginal mean = 11.15 lb./ac.
   S.E. of D marginal mean = 13.65 lb./ac.
   S.E. of control mean or body of Sx D or Cx D table = 19.30 lb./ac.
   S.E. of body of Sx C table = 15.76 lb./ac.

Crop: Groundnut (Kharif).


Object: To study the effect of boron and manganese on Groundnut crop.

1. BASAL CONDITIONS:

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 2 levels of Boron : B_0 = 0 and B_1 = 4 lbs/ac.
   (2) 2 levels of Manganese : M_0 = 0 and M_1 = 6 lbs/ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) 45’x21’. (b) 40’x12’. (v) 24’x41’. (vi) Yes.

4. GENERAL:
   (i) Not satisfactory. (ii) Attack of tikka and aphids, Nicotine sulphate sprayed. (iii) Pod and fodder yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Dohad. (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 791 lb./ac. (ii) 66.27 lb. ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb./ac.

\[
\begin{array}{ccc}
 & B_0 & B_1 \\
M_0 & 834 & 711 & 773 \\
M_1 & 808 & 812 & 810 \\
\end{array}
\]

Mean: 821 762 791

S.E. of any marginal mean = 27.05 lb./ac.
S.E. of body of table = 38.26 lb./ac.

Crop: Groundnut (Kharif).

Object: To study the N, P and K requirements of Groundnut.

1. BASAL CONDITIONS:
(i) (a) Cotton—Bajra or Jowar—Groundnut. (b) Bajra. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 8.7.1956. (iv) (a) N.A. (b) Drilling. (c) 50 lb./ac. (d) Between rows—18”; between plants—irregular. (e) —. (v) 5 C.L./ac. of F.Y.M. spread one month before sowing. (vi) A.H.—32 (medium). (vii) Unirrigated. (viii) 2 interculturings and 2 weedings. (ix) 26.95°. (x) 19.10.1956.

2. TREATMENTS:
All combinations of (1), (2) and (3)
1. 3 levels of N: N_0 =0, N_1 =10 and N_2 =20 lb./ac.
2. 3 levels of P_2O_5: P_0 =0, P_1 =50 and P_2 =100 lb./ac.
3. 3 levels of K_2O: K_0 =0, K_1 =100 and K_2 =200 lb./ac.

N applied as A/S, P_2O_5 as Super and K_2O as Potash. N and K_2O spread at sowing. N was given in two doses, one at planting and the other one month after sowing. Super was drilled in furrows at sowing.

3. DESIGN:
(i) 3^e confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 36’×21’. (b) 30’×15’. (v) 3’×3’. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Attack of tikka disease. (iii) Pod and fodder yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Dohad. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1845 lb./ac. (ii) 136.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb./ac.

\[
\begin{array}{ccc}
 & N_0 & N_1 & N_2 \\
P_0 & 1813 & 1882 & 1882 \\
P_1 & 1738 & 1847 & 1893 \\
P_2 & 1826 & 1850 & 1877 \\
\end{array}
\]

Mean: 1792 1860 1884

\[
\begin{array}{ccc}
 & K_0 & K_1 & K_2 \\
K_0 & 1859 & 1869 & 1798 & 1910 \\
K_1 & 1826 & 1798 & 1825 & 1882 \\
K_2 & 1851 & 1820 & 1811 & 1921 \\
\end{array}
\]

S.E. of any marginal mean = 32.15 lb./ac.
S.E. of body of any table = 35.69 lb./ac.
Crop : Groundnut

Site : Agri. Res. Stn., Amreli

Object : To study the effect of N, P and K with and without F.Y.M. on Groundnut.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Cotton. (c) 40 lb./ac. of manure mixture. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 4.7.1959. (iv) (a) N.A. (b) Drilling. (c) 80 lb./ac. (d) 18' between rows. (e) —. (v) Nil. (vi) A and F—32. (vii) Unirrigated. (viii) N.A. (ix) 45.56'. (x) N.A.

2. TREATMENTS :
Main-plot treatments :
All combinations of (1), (2) and (3).
(1) 3 levels of N as A/S : N₀ = 0, N₁ = 10 and N₂ = 20 lb./ac.
(2) 3 levels of P₀₅ as Super : P₀ = 0, P₁ = 50 and P₂ = 100 lb./ac.
(3) 3 levels of K₂₅ as Pot. sul. : K₀ = 0, K₁ = 100 and K₂ = 200 lb./ac.

Sub-plots treatments :
2 levels of F.Y.M. : F₀ = 0 and F₁ = 5 C.L./ac.

3. DESIGN :
(i) 3³ X 2 confd in split-plot. (ii) (a) 3 blocks/repl.; 9 main-plots/block ; 2 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 36' X 21'. (b) 30' X 15'. (v) 3' X 3'. (vi) Yes.

4. GENERAL :
(i) N.A. (ii) N.A. (iii) Pod and top yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 940 lb./ac. (ii) (a) 141.8 lb./ac. (b) 122.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb./ac.

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S.E. of difference of two.
1. N, P or K marginal means
2. F marginal means
3. F means at the same level of N, P or K
4. N, P or K means at the same level of F
S.E. of body of N X P, N X K, or P X K table

Crop : Groundnut (Kharif) 

Site : Agri. Res. Stn., Amreli

Object : To find out the effect of different micronutrients on the yield of Groundnut.
1. BASAL CONDITIONS:

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Shallow, light black. (b) Refer soil analysis, Amreli. (iii) 11.7.1959. (iv) (a) 4 harrowings. (b) Drilling. (c) 80 lb./ac. (d) 18" between rows. (e) --. (v) 10 lb./ac. of N+20 lb./ac. of P₂O₅. vi) A.H. =32. (vii) Unirrigated. (viii) 3 to 4 interculтурings and 2 weedings. (ix) 45.56". (x) 20.10.1959.

2. TREATMENTS:

All combinations of the following micronutrients each at two levels viz. presence and absence.

(1) Zinc—Zn, (2) Manganese—Mn, (3) Copper—Cu, (4) Molybdenum—Mo and (5) Boron—B.

3. DESIGN:

(i) 2⁵ Fact. in R.B.D. (ii) (a) 32. (b) N.A. (iii) 4. (iv) (a) 30'X18'. (b) 24'X12'. (v) 3'X3'. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Pod yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) 'a' and (b) N.A. (vi) Excessive rain in October affected the yield. (vii) Nil.

5. RESULTS:

(i) 985.66 lb./ac. (ii) 122.4 lb./ac. (iii) Mn, Zn x Mn and Zn x Cu effects are highly significant. Effect of Cu is significant. Other effects are not significant. (iv) Mean and differential responses in lb./ac.

<table>
<thead>
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<th>Mean response</th>
<th>Zn</th>
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<th>Cu</th>
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Differential response

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</tbody>
</table>

S.E. of mean response = -21.64 lb./ac.

S.E. of differential response = 30.60 lb./ac.

Crop := Groundnut (Kharif).


Object := To find out a suitable combination of N, P and K for higher yield of Groundnut.

1. BASAL CONDITIONS:

(i) (a) Groundnut—Cotton. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 17.7.1956. (iv) 'a' Nil. (b) Drilling. (c) 60 lb./ac. (d) 18" between rows. (e) --. (v) Nil. (vi) A.K.—12-24. (vii) Unirrigated. (viii) 1 weeding. (ix) N.A. (x) 31.10.1956.

2. TREATMENTS:

All combinations of (1), (2) and (3)

(1) 3 levels of N : N₀=0, N₁=20 and N₂=40 lb./ac.

(2) 3 levels of P₂O₅ : P₀=0, P₁=18 and P₂=36 lb./ac.

(3) 3 levels of K₂O : K₀=0, K₁=10 and K₂=20 lb./ac.

3. DESIGN:

(i) Fact. in R.B.D. (ii) 'a' 27. (b) N.A. (ii) 1. (iv) (a) 51'X18'. (b) 45'X12'. (v) 3'X3'. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Slight attack of lopper. (iii) Pod yield. (iv) (a) 1956—contd. (b) No. (c) Nil. (v) 'a' and (b) N.A. (vi) Yes and (vii) Nil.

5. RESULTS:

(i) 715 lb./ac. (ii) 81.47 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb./ac.

Ref := Gj. 56(124).

Type := 'M'.
Crop: Groundnut (Kharif).
Site: Central Expt. Stn., Junagadh.

Object: To find out the optimum requirement of N, P and K, with and without F.Y.M. for Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 25.6.1959.
(iv) (a) 1 ploughing. (b) Dibbling. (c) 60 lb./ac. (d) 3′×6′. (e) 2 plants/hill. (v) Nil. (vi) Punjab-l (medium). (vii) Unirrigated. (viii) 2 interculturings and 3 weedings. (ix) 57.54%. (x) 4.11.1959.

2. TREATMENTS:
Main-plot treatments:
2 levels of F.Y.M.: F_0=0 and F_1=10 C.L./ac.
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 Super: P_0=0 and P_1=50 lb./ac.
(3) 2 levels of K_2O as Pot. Sul.: K_0=0 and K_1=25 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication; 8 sub-plots/main-plot. (b) 126′×96′. (i) 6. (iv) (a) 63′×12′. (b) 60′×9′. (v) 1.5′×1.5′. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) Moderate attack of tikka. (iii) Pod yield. (iv) (a) 1952—1960 (modified in 1955-56). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) N.A. (vii) Nil.

5. RESULTS:
(i) 414.6 lb./ac. (ii) (a) 211.0 lb./ac. (b) 80.30 lb./ac. (iii) Only P effect is highly significant. (iv) Av. yield of pod in lb./ac.

<table>
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 Object:—To find out the optimum requirements of N, P and K, with and without F.Y.M. for Groundnut.
Crop :- Groundnut (Kharif).
Site :- Central Expt. Stn., Junagadh.

Object :- To find out P and K requirements of groundnut with and without F.Y.M.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Cotton.  (c) N.A.  (ii) (a) Medium black.  (b) Refer soil analysis, Junagadh.  (iii) N.A.
   (iv) (a) 2 to 3 harrowings.  (b) Dibbling.  (c) N.A.  (d) 3'×4'.  (e) 1.  (f) Nil.  (vi) Punjab—1.  (vii) Un-
   irrigated.  (viii) 2 to 3 interculturings and 3 to 4 weedings.  (ix) 38.33'.  (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of F.Y.M. : F₀=0 and F₁=10 C.L./ac.
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of P₀O₂ : P₀=0, P₁=24 and P₂=48 lb./ac.
   (2) 3 levels of K₀O : K₀=0, K₁=27 and K₂=54 lb./ac.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 2 main-plots/replication ; 9 sub-plots/main-plot.  (b) N.A.  (iii) 6.  (iv) (a) 75'×12'.
   (b) 71'×6'.  (v) 2'×3'.  (vi) Yes.

4. GENERAL:
   (i) Normal.  (ii) Slight attack of aphids and tikka; no control measure taken.  (iii) Height and spreď at
   an interval of 15 days, pod and fodder yield.  (iv) (a) 1952—contd.  (b) and (c) No.  (v) (a) and (b) N.A.
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 878 lb./ac.  (ii) (a) 148.5 lb./ac.  (b) 117.1 lb./ac.  (iii) F and K effects are significant. Other effects are
   not significant.  (iv) Av. yield of pod in lb./ac.

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<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
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S.E. of difference of two
   1. F marginal means =43.07 lb./ac.
   2. P or K marginal means =16.35 lb./ac.
   3. P or K means at the same level of F =23.12 lb./ac.
   4. F means at the same level of P or K =61.04 lb./ac.
   S.E. of body of P×K table =16.35 lb./ac.
Crop: Groundnut (Kharif).
Site: Central Expt. Stn., Junagadh.

Object: To find out N, P and K requirements with and without F.Y.M. of Groundnut in this tract.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Groundnut. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 4.7.1955. (iv) (a) 2 to 3 harrowings. (b) Dibbling. (c) N.A. (d) 3'x4'. (e) 1 seed/dibble. (v) Nil. (vi) Punjab—1. (vii) Unirrigated. (viii) 3 weedings and 1 gap filling. (ix) 21.93'. (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of F.Y.M: F_0 = 0 and F_1 = 10 C.L./ac.
   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 Super: P_0 = 0 and P_1 = 25 lb./ac.
   (3) 2 levels of K_2O as Pot. Sul: K_0 = 0 and K_1 = 50 lb./ac.
   F, P_2O_5 and K_2O applied in furrows 15, 10 and 10 days before sowing respectively. N applied at sowing and 15 days after germination.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 8 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 50' X 12'. (b) 44' X 6'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
   (i) Not satisfactory due to late and scanty rain. (ii) Slight attack of aphids controlled by Nicotine sulphate spray. (iii) Pod and top yield. (iv) (a) 1952—condt. (modified in 1955). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1334 lb./ac. (ii) (a) 207.7 lb./ac. (b) 113.0 lb./ac. (iii) Effect of P and interaction N x P are significant. Others are not significant. (iv) Av. yield of pod in lb./ac.

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S.E. of difference of two
1. F marginal means = 46.44 lb./ac.
2. N, P or K marginal means = 25.27 lb./ac.
3. N, P or K means at the same level of F = 35.74 lb./ac.
4. F means at the same level of N, P or K = 52.87 lb./ac.

Table of mean and differential responses for N P and K levels

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<td>-16.91</td>
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S.E. of mean response = 25.27 lb./ac. S.E. of differential response = 35.73 lb./ac.
Crop: Groundnut (Kharif).
Site: Central Expt. Stn., Junagadh.

Object: To find out the N, P, and K requirements of groundnut with and without F.Y.M. in this tract.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. iii) 1.7.1957. (iv) a) 2 to 3 harrowings. (b) Dibbling. (c) N.A. (d) 3’x4’. (e) Ona seed dibble. (v) Nil. (vi) Punjab—1 (spreading time). (vii) Unirrigated. (viii) Two interculturings and three weedings. (ix) 34’. (x) 9.11.1957.

2. TREATMENTS:
   Same as in exp no. 55.40, on page 331.

3. DESIGN:
   (i) Split-plot. (ii) a) 2 main-plots/block; 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) a) 63’x15’. (b) 60’x9’. (v) 1’x3’. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Slight attack of tikka and aphids; no control measures. (iii) Height and spread observations at an interval of 15 days, pod and fodder yield. (iv) (a) 1952—contd. modified in 1955. (b) and (c) No. (v) (a) and (b) N.A. (vi) Nil. (vii) Lack of rain after 15th August affected flowering and seed formation.

5. RESULTS:
   (i) 610 lb./ac. (ii) a) 127.0 lb./ac. (b) 93.3 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb./ac.

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S.E. of difference of two
1. F marginal means = 25.92 lb./ac.
2. N, P or K marginal means = 19.05 lb./ac.
3. N, P or K means at the same level of F = 26.93 lb./ac.
4. F means at the same level of N, P or K = 32.16 lb./ac.

S.E. of body of N x P, N x K, or P x K table = 19.05 lb./ac.
2. TREATMENTS:

Main-plot treatments:
- 2 levels of F.Y.M. $F_0 = 0$ and $F_1 = 10$ lb./ac.

Sub-plot treatments:
- All combinations of (1), (2) and (3)
- (1) 2 levels of N: $N_0 = 0$ and $N_1 = 20$ lb./ac.
- (2) 2 levels of P$_2O_5$: $P_0 = 0$ and $P_1 = 50$ lb./ac.
- (3) 2 levels of K$_2O$: $K_0 = 0$ and $K_1 = 25$ lb./ac.

3. DESIGN:
- (i) Split-plot. (ii) (a) 2 main-plots/replication; 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 63' x 15'.
- (b) 60' x 9'. (v) 1.5' x 3'. (vi) Yes.

4. GENERAL:
- (i) Satisfactory. (ii) Attack of tikka. (iii) Pod yield. (vi) (a) 1952—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
- (i) 1442 lb./ac. (ii) (a) 242.40 lb./ac. (b) 131.68 lb./ac. (iii) Only P effect is highly significant. (iv) Av. yield in lb./ac.

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<th>$P_0$</th>
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S.E. of difference of two
- 1. F marginal means = 49.48 lb./ac.
- 2. N, P or K marginal means = 28.80 lb./ac.
- 3. N, P or K means at the same level of F = 40.73 lb./ac.
- 4. F means at the same level of N, P or K = 56.25 lb./ac.

Table of mean and Differential response for N, P and K levels

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</table>

S.E. of mean response = 26.76 lb./ac.
S.E. of differential response = 37.84 lb./ac.

Crop : Groundnut.
Site : Trial-cum-Demonstration Farm, Kholwad.
Ref : Gj. 59(76).
Type : 'M'.

Object : To find out the optimum dose and method of application of Super to Groundnut.

1. BASAL CONDITIONS:
- (i) (a) Nil. (b) Jowar. (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 9 and 10.7.1959. (iv) (a) Two harrowings. (b) Drilling. (c) £0 lb./ac. (d) 2'. (e) N.A. (v) 3 C.L./ac. of F.Y.M. broadcast on 13.6.1959.
- (vi) A.H. = 32. (vii) Unirrigated. (viii) Two intercultrulings and gap filling. (ix) 106.6'. (x) 20 to 25.11.1958.
2. TREATMENTS:

Main-plot treatments:
3 methods of applying P₂O₅: M₁ = Broadcasting (on 3.7.1959), M₂ = Drilling in rows (on 9.7.1959) and M₃ = Drilling between rows (on 3.8.1959).

Sub-plot treatments:
3 doses of P₂O₅ as Super: P₀ = 0, P₁ = 20 and P₂ = 40 lb/ac.

3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 42'x38'. (b) 36'x30'. (v) 3'x4'. (vi) Yes.

4. GENERAL:
(i) Not good. (ii) Tikka disease was observed. (iii) Pod yield. (iv) (a) 1959—contd. (b) and (c) —. (v) (a) and (b) N.A. (vi) Due to floods in Tapti river there was about 6' deep water in the exp'tl. area which affected the yield. (vii) Nil.

5. RESULTS:
(i) 457 lb/ac. (ii) (a) 98.3 lb/ac. (b) 88.30 lb/ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb/ac.

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Mean: 463 475 432 457

Mean = 32.77 lb/ac.

1. M marginal means = 29.43 lb/ac.
2. P marginal means = 50.98 lb/ac.
3. P means at the same level of M = 29.97 lb/ac.
4. M means at the same level of P = 32.77 lb/ac.

Crop :- Groundnut (Kharif).
Site :- Agri. Res. Stn., Talod.
Object :- To find out N, P and K requirements of Groundnut.

Ref :- Gj. 55(55).
Type :- 'M'.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Sandy soil. (b) Refer soil analysis, Talod. (iii) 24.7.1955.
(iv) (a) N.A. (b) Drilling. (c) 30 lb/ac. (d) Between rows 18'. (e) N.A. (v) 5 C.L./ac. of F.Y.M.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S: N₀ = 0, N₁ = 10 and N₂ = 20 lb/ac.
(2) 3 levels of P₂O₅ as Super: P₀ = 0, P₁ = 50 and P₂ = 100 lb/ac.
(3) 3 levels of K₂O as Potash: K₀ = 0, K₁ = 100 and K₂ = 200 lb/ac.
N applied in two doses; first spread at sowing and second six weeks after sowing.

3. DESIGN:
(i) 3² confounding NPK² in both replications. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A.
(iii) 2. (iv) (a) 21'x36'. (b) 15'x36'. (v) 3'x3'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Pod and stalk yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1280 lb/ac. (ii) 173.3 lb/ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb/ac.
Crop = Groundnut (*Kharij*).

Site :- Agri. Res. Stn., Talod.

Object.—To find out N, P and K requirements of Groundnut.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Sandy Goradu. (b) Refer soil analysis, Talod. (iii) 22.6.1956. (iv) (a) N.A. (b) Drilling. (c) 30 lb./ac. (d) 18" between rows. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) A.H.—32. (vii) Unirrigated. (viii) 3 interculturings and 2 weedings. (ix) 40.59". (x) N.A.

2. **TREATMENTS**:
   Same as in expt. no. 55(55) on page 334.

3. **DESIGN**:
   (i) 3³ confounding. NPK² in both replications. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 36"×21'. (b) 30'×15'. (v) 3'×3'. (vi) Yes.

4. **GENERAL**:
   (i) Not satisfactory. (ii) Attack of aphids. (iii) Pod yield. (iv) (a) 1955—contd. (b) No. (c) Nil (v) (a) and (b) N.A. (vi) Late rain affected the yield and growth. (vii) Nil.

5. **RESULTS**:
   (i) 1836 lb./ac. (ii) 199.8 lb./ac. (iii) K effect alone is significant. (iv) Av. yield of pod in lb./ac.

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<th>N₂</th>
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S.E. of any marginal mean = 47.1 lb./ac.
S.E. of body of any table = 81.6 lb./ac.
Crop :- Groundnut (Kharif).
Site :- Agri. Res. Stn., Talod.

Object :- To find out the N, P and K requirements of Groundnut with and without F.Y.M.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Moong. (c) Nil. (d) 'a' Sandy Goradu. (b) Refer soil analysis, Talod. (iii) 30.6.1957.
   (iv) 'a' N.A. (b) Drilling. 33 lb. ac. (d) 18° between rows. (e) N.A. (v) Nil. (vi) A.H.—32. (vii) Unirrigated.
   (viii) 3 interculturings and 2 weedings. (ix) 14.99°. (x) 29.9.1957.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 59,64, on page 327.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Pod yield. (iv) (a) 1955—contd. (modified in 1957). (b) No. (c) Nil. (v) a; and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 898 lb./ac. (ii) (a) 50.90 lb./ac. (b) 71.82 lb./ac. (iii) (iv) Av. yield of pod in lb./ac.

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S.E. of difference of two
1. N. P or K marginal means = 16.96 lb./ac.
2. F marginal means = 19.54 lb./ac.
3. F means at the same level of N, P or K = 33.85 lb./ac.
4. N, P or K means at the same level of F = 29.33 lb./ac.
5. S.E. of body of N×P, N×K or P×K table = 20.78 lb./ac.
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S.E. of difference of two:
1. N, P or K marginal means = 67.77 lb./ac. 
2. F marginal means = 46.32 lb./ac. 
3. F means at the same level of N, P or K = 80.23 lb./ac. 
4. N, P or K means at the same level of F = 88.37 lb./ac. 
S.E. of body of \( N \times P, N \times K \) or \( P \times K \) table = 83.00 lb./ac.

**Crop:** Groundnut (Kharif).

**Site:** Agri. Res. Sta., Talod.

**Object:** To find out the N, P and K requirements of Groundnut with and without F.Y.M.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Mug. (c) Nil. (ii) Sandy soil. (b) Refer soil analysis, Talod. (iii) 30.6.1957. (iv) (a) 1 ploughing and 2 harrowings. (b) N.A. (c) 30 lb./ac. (d) 18" between rows. (e) Nil. (f) A.H.—32 (early). (g) Unirrigated. (h) 3 [interculturings and 2 weedings. (ix) 14.59". (x) 29.9.1957.

2. **TREATMENTS and 3. DESIGN:**
   Same as in expt. no. 59(64) on page 327.

4. **GENERAL:**
   (i) Good. (ii) Attack of collar rot. (iii) Pod and top yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 898 lb./ac. (ii) (a) 51.30 lb./ac. (b) 71.83 lb./ac. (iii) K effect alone is significant. (iv) Av. yield of pod in lb./ac.

<table>
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**Ref:** Gj. 57(109).

**Type:** 'M'.

---

### BASAL CONDITIONS:
1. **N, P or K marginal means**
2. **F marginal means**
3. **F means at the same level of N, P or K**
4. **N, P or K means at the same level of F**
   - S.E. of body of \( N \times P, N \times K \) or \( P \times K \) table

### RESULTS:
1. **898 lb./ac.**
2. **51.30 lb./ac.**
3. **71.83 lb./ac.**
4. **K effect alone is significant.**
5. **Av. yield of pod in lb./ac.**
Crop: Groundnut (Kharif).

Object: To find out the N, P and K requirements of Groundnut with and without F.Y.M.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil. (d) Sandy soil. (b) Refer soil analysis, Talod. (iii) 23.6.1958. (iv) (a) I ploughing and 3 harrowings. (b) N.A. (c) 30 lb./ac. (d) 18" between rows. (e) —. (v) Nil. (vi) A.H.—32 early. (vii) Unirrigated. (viii) 3 interculturings and 3 weedings. (ix) 27.9°. (x) 15.8.1958.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 59(64) on page 327,

4. GENERAL:
   (i) Normal. (ii) Attack of collar rot and white ant. (iii) Pod and top yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1573 lb./ac. (ii) [a] 131.3 lb./ac. (b) 172.5 lb./ac. (iii) N effect alone is highly significant. (iv) A.r. yield of pod in lb./ac.

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S.E. of difference of two
1. N, P or K marginal means = 17.10 lb./ac.
2. F marginal means = 19.55 lb./ac.
3. F means at the same level of N, P or K = 33.86 lb./ac.
4. N, P or K means at the same level of F = 29.42 lb./ac.
S.E. of body of N×P, N×K or P×K table = 20.94 lb./ac.

Crop: Groundnut (Kharif).

Object: To find out the N, P and K requirements of Groundnut with and without F.Y.M.
1. **BASAL CONDITIONS**:

   (i) (a) Nil. (b) Mor (c) Nil. (ii) (a) Sandy soil. (b) Refer soil analysis, Talod. (iii) 27.6.1959. (iv) (a) 1 ploughing and 3 harrowings. (b) N.A. (c) 30 lb./ac. (d) 18” between rows. (e) — (v) Nil. (vi) A.K.—32 (early). (vii) Unirrigated. (viii) 3 interculturings and 3 weedings. (ix) 53.68°. (x) 12.10.1959.

2. **TREATMENTS and DESIGN**:

   Same as in ext. no. 59(64) on page 327.

3. **GENERAL**:

   (i) Normal. (ii) Attack of collar rot and white ant. (iii) Pod and top yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

4. **RESULTS**:

   (i) 1362 lb./ac. (ii) (a) 172.3 lb./ac. (b) 131.3 lb./ac. (iii) F and P effects are significant. Other effects are not significant. (iv) Av. yield of pod in lb./ac.

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S.E. of difference of two

1. N, P or K marginal means =57.43 lb./acc.
2. F marginal means =35.73 lb./ac.
3. F means at the same level of N, P or K =61.89 lb./ac.
4. N, P or K means at the same level of F =72.21 lb./ac.
S.E. of body of N×P, N×K or P×K table =70.34 lb./ac.

---

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

**Site :- Agri. Res. Stn., Umrala**.

**Object :-** To study the effect of N, P and K on the yield of Groundnut.

1. **BASAL CONDITIONS**:

   (i) (a) to (c) Nil. (ii) (a) Medium black (b) Refer soil analysis, Umrala. (iii) 8.7.1956. (iv) (a) Nil. (b) Drilling. (c) 50 lb./ac. (d) 2' between rows. (e) — (v) Nil. (vi) A.K.—12-24. (vii) Irrigated. (viii) Three weeding, one interculturing and gap-filling. (ix) N.A. (x) 27 and 28.10.1956.

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 P2 0 as Super: P0=0, P1=20 and P2=40 lb./ac.
   (3) 3 levels of K as Muriate of Potash: K0=0, K1=20 and K2=40 lb./ac.

   Fertilizers applied at sowing.

3. **DESIGN**:

   (i) 3² Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) 30‘×12’. (b) 26‘×8’. (v) 2‘×2’. (v) Yes.

4. **GENERAL**:

   (i) Good. (ii) Attack of aphids—nicotine sulphate sprayed. (iii) Pod and top yield. (iv) 1956—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 1261 lb./ac.  (ii) 157.4 lb./ac.  (iii) None of the effects is significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
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S.E. any marginal =26.23 lb./ac.
S.E. body of any table =45.43 lb./ac.

**Crop :- Groundnut and Sesamum.**

**Site :- M.A.E. Farm, Umrala.**

**Object:** To study the effect of direct application of P2O5 to legumes and its residual effect on cereal crop under irrigated condition.

1. BASAL CONDITIONS:
   (i) (a) Groundnut, Sesamum—Wheat.  (b) Wheat.  (c) N.A.  (ii) (a) Medium black.  (b) Refer soil analysis, Umrala.  (iii) 7.7.1959 for 1959 year crop. N.A. for other years.  (iv) (a) One ploughing and 1 harrowing.  (b) Drilling. (c) Groundnut at 80 lb./ac. and sesame at 3 lb./ac. (d) 18" between rows. (e) —.  (v) Nil.  (vi) Groundnut A.K. 12-24; Sesamum S. 4-6.  (vii) Unirrigated.  (viii) Nil.  (ix) 25-98° during 1959 crop. N.A. for other years.  (x) For 1959 crop it is 20.10.1959. N.A. for other years.

2. TREATMENTS:
   3 levels of P2O5 applied to each of the two oilseed crops : P0=0, P1=40 and P2=80 lb./ac.

3. DESIGN:
   (i) R.B.D.  (ii) 3 for each crop.  (b) 43'×84'.  (iii) 3 for each crop.  (iv) (a) 43'×12'.  (b) 60'×6'.  (v) 1.5'×3'.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) N.A.  (iii) Pod and grain yield.  (iv) 1956—contd.  (b) Yes.  (c) N.A.  (v) (a) N.A.  (b) Nil.  (vi) Nil.  (vii) N.A.

5. RESULTS:

For all figures in lb./ac.

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<tr>
<th></th>
<th>1956</th>
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</table>

S.E./plot 86.2 63.2 80.0 52.9
S.E./mean 49.8 36.5 46.2 30.5
Significance H.S. H.S. N.S. N.S.

N.B. :- H.S. denotes highly significant ; S denotes significant and N.S. denotes not significant.
Crop: Groundnut (Kharif).

Site: Dry Farming Res. Stn., Jamkhambhalia.

Coffee: To find out the optimum dose of N, P and K with different varieties of Groundnut.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Groundnut. (c) Nil. (ii) (a) Shallow. (b) N.A. (iii) 10.7.1959. (iv) (a) 1 ploughing and I harrowing. (b) Drilling. (c) 80 lb./ac. (d) 2' between rows. (e) — (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 3 interculturings. (ix) 44". (x) 7.11.1959.

2. TREATMENTS:

Main-plot treatments:
All combinations of (1), (2) and (3)
(1) 3 varieties of groundnut: V1 = Local, V2 = AK-12-24 and V3 = AH-32
(2) 3 levels of N as A/S: N0 = 0, N1 = 20 and N2 = 40 lb./ac.
(3) 3 levels of P2O5 as Super: P0 = 0, P1 = 20 and P2 = 40 lb./ac.

Sub-plot treatments:
2 levels of K2O as Pot. Sol.: K0 = 0 and K1 = 40 lb./ac.
N top dressed and P2O5 drilled at sowing.

3. DESIGN:

(i) 33x2 split-plot. (ii) (a) 3 blocks/replication; 9 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 1. (iv) (a) 36"x21". (b) 30"x15". (v) 3"x3". (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Attack of tikka. (iii) Pod yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) and (vi) Nil.

5. RESULTS:

(i) 569 lb./ac. (ii) (a) 188.0 lb./ac. (b) 100.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb./ac.

<table>
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<th>V1</th>
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</table>

S.E. of difference of two

1. V, N or P marginal means = 62.67 lb./ac.
2. K marginal means = 27.22 lb./ac.
3. K means at the same level of V, N or P = 47.14 lb./ac.
4. V, N or P means at the same level of K = 70.98 lb./ac.
5. S.E. of body of PxV, PxN or NxV table = 76.75 lb./ac.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) 30 lb./ac. of manure mixture. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) N.A. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) —. (v) Nil. (vi) AH—32. (vii) Unirrigated. (viii) N.A. (ix) 28.50". (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 spacings between rows: S₁ = 18", S₂ = 24" and S₃ = 30".
   Sub-plot treatments:
   3 seed rates: R₁ = 60, R₂ = 80 and R₃ = 100 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 30' x 40', (b) 24' x 34'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Pod yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 737 lb./ac. (ii) (a) 88.75 lb./ac. (b) 79.50 lb./ac. (iii) Main effects of S and R are significant. Interaction is not significant. (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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<td>695</td>
</tr>
<tr>
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<td>768</td>
<td>558</td>
<td>728</td>
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<tr>
<td>R₃</td>
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<tr>
<td>Mean</td>
<td>854</td>
<td>786</td>
<td>570</td>
<td>737</td>
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</table>

S.E. of difference of two
1. S marginal means = 36.66 lb./ac.
2. R marginal means = 32.46 lb./ac.
3. R means at the same level of S = 56.22 lb./ac.
4. S means at the same level of R = 59.25 lb./ac.

Crop: — Groundnut (Kharif).

Ref: — Gj. 59(45).
Type: — 'C'.

Object: — To find out the economic seed rate and spacing for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) S.C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) N.A. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) —. (v) Nil. (vi) AH—32. (vii) Unirrigated. (viii) N.A. (ix) 45.56". (x) N.A.

2. TREATMENTS and 3. DESIGN:
   Same as in exppt. no. 58/70; on page 341.

4. GENERAL:
   (i) and (ii) N.A. (iii) Pod yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 349 lb./ac. (ii) (a) 125.3 lb./ac. (b) 31.4 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of pod in lb./ac.
Ceop :- Groundnut (Kharif).
Site :- Agri. Res. Stn., Dohad.
Ref :- Gj. 54(32).
Type :- ‘C’.

Object :- To find out the economic seed rate and spacing for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Groundnut—Fallow—Groundnut. (b) Fallow. (c) 5 C.L./ac. of F.Y.M. (d) (a) Medium brown.
   (b) Refer soil analysis, Dohad. (iii) 19 and 20.7.1954. (iv) (a) N.A. (b) Sown by plough. (c) As per treatments. (d) Between plants—irregular. Between rows—as per treatments. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Spanish—5. (vii) Unirrigated. (viii) Interculturing by plough and hand weeding. (ix) 49.29". (x) 8 to 15.11.1954.

2. TREATMENTS:
   Main-plot treatments :
   (a) 3 spacing between rows: S1=12", S2=15" and S3=18".

   Sub-plot treatments :
   (a) 3 seed rates: R1=80, R2=100 and R3=120 lb./ac.

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/block ; 3 sub-plots/main-plot. (b) N.A. (iii) 6 (iv) (a) 36'×21' for S1, 36'×22.5' for S2 and 36'×24' for S3. (b) 30'×15'. (v) 3 rows on either side and 3' at either end of the net plot. (vi) Yes.

4. GENERAL:
   (i) Good germination and vigorous growth. Heavy rainfall during September, 1954. (ii) Tikka disease. (iii) Pod yield. (iv) (a) 1952—1954. (b) and (c) No. (v) (a) Deesa. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 840 lb./ac. (ii) (a) 150.2 lb./ac. (b) 112.0 lb./ac. (iii) Main effect of S alone is highly significant. (iv) Av. yield of pod in lb./ac.

<table>
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<tr>
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<th>S1</th>
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<td>826</td>
<td>951</td>
<td>840</td>
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</table>

S.E. of difference of two
1. S marginal means = 50.1 lb./ac.
2. R marginal means = 37.3 lb./ac.
3. R means at the same level of S = 64.7 lb./ac.
4. S means at the same level of R = 72.7 lb./ac.
Crop :- Groundnut (Kharif).

Object :- To find out suitable sowing date for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) 100 lb./ac. of A/S. (ii) (a) Medium black. (b) Refer soil analysis, Halvad.
   (iii) As per treatments. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) 50 lb./ac. (d) 18°
   between rows. (e) N.A. (v) 300 lb./ac. of manure mixture + 200 lb./ac. of P<sub>2</sub>O<sub>5</sub> broadcast on 29.5.1955.

2. TREATMENTS :

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 51'×18'. (b) 45'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Pod yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A., (vi)
   and (vii) Nil.

5. RESULTS :
   (i) 1165 lb./ac. (ii) 98.66 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of pod
   in lb./ac.
   Treatment | D<sub>1</sub> | D<sub>2</sub> | D<sub>3</sub> | D<sub>4</sub>
--- | --- | --- | --- | ---
Av. yield | 1285 | 1343 | 1241 | 792
S.E./mean = 40.28 lb./ac.

---

Crop :- Groundnut (Kharif).

Object :- To find out suitable dates of sowing for Groundnut.

1. BASAL CONDITIONS :
   (i) (a) Nil. (ii) Cotton. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii)
   As per treatments. (iv) (a) N.A. (b) Harrowing. (c) to (e) N.A. (v) 200 lb./ac. of mono-super before

2. TREATMENTS:

3. DESIGN :
   (i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 40'×14'. (b) 34'×7½'. (v) Two rows on each side.
   (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Height of plant; width of plant, no. of pods and pod yield. (iv) (a) 1955—conid.
   (b) and (c) No. (v) [a] and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 490 lb./ac. (ii) 66.75 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of pod in lb./ac.
   Treatment | D<sub>1</sub> | D<sub>2</sub> | D<sub>3</sub> | D<sub>4</sub> | D<sub>5</sub>
--- | --- | --- | --- | --- | ---
Av. yield | 454 | 552 | 556 | 460 | 428
S.E./mean = 29.83 lb./ac.
Crop :- Groundnut (Kharif).

Object :- To find out suitable dates of sowing for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton. (b) Bajra. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) As per treatments. (iv) (a) 1 harrowing. (b) Drilling. (c) 60 lb./ac. (d) 18" between rows. (e) N.A. (v) 200 lb./ac. of P₂O₅ before sowing. (vi) AK—12—24. (vii) Irrigated. (viii) 1 interculturings and 2 weedicings. (ix) 13''. (x) 15, 17, 20 and 22.10.1958.

2. TREATMENTS:

3. DESIGN:
   (i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 40'×14'. (b) 34'×7'. (v) 3'×3'. (vi) Yes.

4. GENERAL
   (i) Good. (ii) Yellow leaf and tikka disease. (iii) Pod yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) Junagadh. (b) N.A. (vi) Nil. (vii) As the layout plan is not available, the experiment is analysed as R.B.D.

5. RESULTS:
   (i) 1223 lb./ac. (ii) 144.1 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of pod in lb./ac.

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<tr>
<th>Treatment</th>
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<td>1321</td>
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<td>S.E./mean</td>
<td>64.4 lb./ac.</td>
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</tbody>
</table>

Crop :- Groundnut (Kharif).

Object :- To study the most suitable spacing for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 29.6.1955. (iv) (a) 1 ploughing and 2 harrowings. (b) Dibbling. (c) Varies between 30 and 120 lb./ac. according to spacing. (d) As per treatments. (e)—. (v) 200 lb./ac. of P₂O₅ on 20.6.1955. (vi) Samrau no. 1. (vii) Irrigated. (viii) 2 interculturings. (ix) 13.75''. (x) 2 and 3.11.1955.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 row spacings : R₁=2' and R₂=3'.
   (2) 3 plant spacings : S₁=2", S₂=4" and S₃=6".

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 3. (iv) (a) 51'×18'. (b) 45'×12'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Pod yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2794 lb./ac. (ii) 400.5 lb./ac. (iii) Only effect of R is highly significant. (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
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<td>2760</td>
<td>2587</td>
<td>2794</td>
</tr>
</tbody>
</table>
Crop :- Groundnut (Kharif).

Object :-To study the most suitable spacing for Groundnut.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Cotton. (c) 300 lb./ac. of P2O5. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. 
(iii) 8.7.1956. (iv) (a) 2 harrowings. (b) Dibbling. (c) 60 lb./ac. (d) As per treatments. (e) N.A. 
(v) Nil. (vi) Samrala no. 1. (vii) Unirrigated. (viii) 4 interculturings. (ix) 33.75°. (x) 15.11.1956.

2. TREATMENTS and 3. DESIGN :
Same as in expt. no. 55(27) on page 345.

3. GENERAL 
(i) Normal. (ii) Nil. (iii) Pod yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. 
(vi) and (vii) Nil.

4. RESULTS :
(i) 916 lb./ac. (ii) 112.0 lb./ac. (iii) Effects of R and S are highly significant. Interaction is not significant. 
(iv) Av. yield of pod in lb./ac.

<table>
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<td>R2</td>
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<td>1040</td>
<td>862</td>
<td>847</td>
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S.E. of marginal mean of S = 32.3 lb./ac.
S.E. of marginal mean of R = 39.6 lb./ac.
S.E. of body of table = 56.0 lb./ac.

Crop :- Groundnut (Kharif).

Object :-To find out the suitable spacing for Groundnut.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. 
(iii) 1.7.1957. (iv) (a) Ploughing and harrowing. (b) to (c) N.A. (v) 200 lb./ac. of Super. (vi) Samrala no. 1. 
(vii) Irrigated. (viii) Interculturings and weedings. (ix) 15.09°. (x) N.A.

2. TREATMENTS :
Same as in expt. no. 55(27) on page 345.

3. DESIGN :
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) One row on each side. (vi) Yes.

4. GENERAL :
(i) Satisfactory. (ii) Nil. (iii) Pod yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. 
(vi) and (vii) Nil.

5. RESULTS :
(i) 949 lb./ac. (ii) 117.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb./ac.
Crop: Groundnut (Kharif).
Site: Dry Farming Res. Stn., Jam-khambhalia.

Object: To find out the effect of intercultures on Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) Nil. (ii) (a) Shallow. (b) N.A. (iii) 10.7.1959. (iv) (a) 2 ploughings. (b) Drilling. (c) 80 lb./ac. (d) 2' between rows. (e) —. (v) Nil. (vi) AK—12-24. (vii) Unirrigated. (viii) As per treatments. (ix) 44". (x) 6.11.1959.

2. TREATMENTS:
   1. No interculture.
   2. One interculturings 6 weeks after sowing.
   3. Two interculturings 4 and 6 weeks after sowing.
   4. Three interculturings 4, 6 and 8 weeks after sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) 96' x 30'. (iii) 6. (iv) (a) 24' x 30'. (b) 18' x 24'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
   (i) Below normal. (ii) Attack of tikka. (iii) Pod yield. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 156 lb./ac. (ii) 140.5 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of pod in lb./ac.

   Treatment | 1 | 2 | 3 | 4
   Av. yield  | 130| 109| 227| 160
   S.E./mean  | =57.35 lb./ac.

---

Crop: Groundnut (Kharif).
Site: Dry Farming Res. Stn., Jam-khambhalia.

Object: To study the effect of spacing and seed rate on the yield of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Shallow. (b) N.A. (iii) 13.7.1959. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (f) Nil. (vi) AK—12-24. (vii) Unirrigated. (viii) 3 interculturings. (ix) 44". (x) 7.11.1959.

2. TREATMENTS:
   Main-plot treatments:
   3 spacings between rows: \( S_1 = 12" \), \( S_2 = 24" \) and \( S_3 = 36" \).
   Sub-plot treatments:
   3 seed rates: \( R_1 = 60 \), \( R_2 = 80 \) and \( R_3 = 100 \) lb./ac.
3. DESIGN
(i) Split-plot. (ii) 3 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 45' x 30'. (b) 39' x 24'. (v) 3' x 3'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of tikka. (iii) Pod yield. (iv) (a) 1959—contd. (b) Nil. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 463 lb./ac. (ii) (a) 159.0 lb./ac. (b) 74.6 lb./ac. (iii) Main effect of S alone is significant. (iv) Av. yield of pod in lb./ac.

<table>
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<td>S₃</td>
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</table>

Mean 465 450 475 463

S.E. of difference of two
1. S marginal means = 53.0 lb./ac.
2. R marginal means = 24.9 lb./ac.
3. R means at the same level of S = 43.1 lb./ac.
4. S means at the same level of R = 63.6 lb./ac.

Crop: Groundnut (Kharif).
Site: Agri. Res. Farm, Jamnagar.
Object: To find out optimum spacing for Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) N.A. (iv) (a) 1 ploughing and 2 harrowings. (b) Dibbling. (c) 40 lb./ac. (d) As per treatments. (e) 2 seeds/dibble. (v) 20 lb./ac. of N as A/S top dressed on 12.9.1955. (vi) Samarala no. 1. (vii) Irrigated. (viii) 2 interculturings and 1 weeding.

2. TREATMENTS:
All combinations of (I) and (2)
(I) 2 spacings between rows: R₁ = 2' and R₂ = 3'.
(2) 3 spacings between plants: S₁ = 3', S₂ = 4' and S₃ = 6'.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) N.A. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Slight attack of tikka. (iii) Pod yield. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Raw data and plot size—N.A.

5. RESULTS:
(i) 1908 lb./ac. (ii) N.A. (iii) Treatment differences are highly significant. (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
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</table>

Mean 2009 1935 1779 1908

S.E.'s = N.A.
Crop :- Groundnut (Kharif).
Site :- Agri. Res. Farm, Jamnagar.

Object :- To find out the optimum spacing for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A.  
   (ii) (a) Medium black. (b) N.A.  
   (iii) 9.7.1956.  
   (iv) (a) N.A. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A.  
   (v) N.A.  
   (vi) Samrara no. 1.  
   (vii) Unirrigated. (viii) N.A.  
   (ix) 29.03.  
   (x) 9.11.1956.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 55(100) on page 348.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Pod yield. (iv) (a) 1955—N.A. (b) N.A.  
   (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Raw data and plot size N.A.

5. RESULTS:
   (i) 1707 lb./ac. (ii) N.A. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac.

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S:E's = N.A.

Crop :- Groundnut (Kharif).
Site :- Central Expt. Stn., Junagadh.

Object :- To determine the optimum spacing between rows and plants for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A.  
   (ii) (a) Medium black. (b) Refer soil analysis, Junagadh.  
   (iii) N.A.  
   (iv) (a) 3 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 1 seed/dibble.  
   (ix) 38.33. (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 55(27) on page 345.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 50'×12'. (b) 44'×6'. (v) 3'×3'. (vi) Ycs.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Pod yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) N.A.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 984 lb./ac. (ii) 81.33 lb./ac. (iii) Only S effect is highly significant. (iv) Av. yield of pod in lb./ac.

<table>
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<tr>
<td>Mean</td>
<td>1049</td>
<td>954</td>
<td>951</td>
<td>984</td>
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</table>
Crop: Groundnut (Kharif).

Site: Central Expt. Stn., Junagadh.

Object: To determine the optimum spacing between plants and between rows for Groundnut.

1. BASAL CONDITIONS:
   (i) a Nil. (b) Cotton. (c) N.A. (ii) a Medium black. (b) Refer soil analysis, Junagadh. (iii) N.A. (iv) (a) 3 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 1 seed/hole. (v) 5 C.L.ac. of F.Y.M applied in furrows 15 days before sowing. (vi) Punjab—1 spreading type (medium). (vii) Unirrigated. (viii) 2-3 interculturings and 3-4 weedings. (ix) 21.93°. (x) N.A.

2. TREATMENTS:
   Same as in exp. no. 55:27, on page 345.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) a 6. (b) N.A. (iii) 6. (iv) (a) 50'×12'. (b) 44'×6'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Not satisfactory. (ii) Nil. (iii) Pod and fodder yield. (iv) (a) 1951—contd. (b) No. (c) Nil. (v) (a) and (b, N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 692 lb./ac. (ii) 94.79 lb./ac. (iii) Effects of S and R are highly significant. Interaction is not significant. (iv) Av. yield of pod in lb./ac.

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<tr>
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<td>669</td>
<td>622</td>
<td>672</td>
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S.E. of marginal mean of R = 22.34 lb./ac.
S.E. of marginal mean of S = 27.36 lb./ac.
S.E. of body of table = 38.70 lb./ac.

Crop: Groundnut (Kharif).

Site: Central Expt. Stn., Junagadh.

Object: To determine the optimum spacing between rows and between plants for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) N.A. (iv) (a) 3 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 1 seed/hole. (v) 5 C.L.ac. of F.Y.M applied in furrows 15 days before sowing. (vi) Punjab—1 spreading type (medium). (vii) Unirrigated. (viii) 2-3 interculturings and 3-4 weedings. (ix) 39.56°. (x) N.A.

2. TREATMENTS:
   Same as in exp. no. 55:27; on page 345.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) a 6. (b) N.A. (iii) 4. (iv) (a) 50'×12'. (b) 44'×6'. (v) 3'×3'. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Tikka and aphids, considerable damage. No control measures taken. (iii) Pod and fodder yield. (iv) (a) 1951—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1863 lb./ac. (ii) 229.4 lb./ac. (iii) Main effect of S is highly significant. Effect of R and interaction S × R are significant. (iv) Av. yield of pod in lb./ac.

<table>
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<td>2202</td>
<td>1781</td>
<td>1604</td>
<td>1863</td>
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S.E. of R marginal mean = 66.2 lb./ac.
S.E. of S marginal mean = 81.1 lb./ac.
S.E. of body of table = 114.7 lb./ac.

---

Crop : Groundnut (Kharif).

Site : Central Expt. Stn., Junagadh.

Ref : Gj. 57(48).

Type : 'C'.

Object : To determine the optimum spacing between rows and between plants for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 18.7.1957. (iv) (a) 2-3 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 1 seed/dibble. (v) 10 C.I./ac. of F.Y.M. applied in furrows 15 days before sowing. (vi) Panjab—1 (spreading type). (vii) Unirrigated. (viii) 2 interculturings and 2 weedings. (ix) 30.21". (x) 1.11.1957.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 spacings between rows : R₁ = 1', R₂ = 1.5', R₃ = 2' and R₄ = 3'.
   (2) 3 spacings between plants : S₁ = 2", S₂ = 4" and S₃ = 6".

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 63'×12'. (b) 60'×6'. (v) 1'×3'. (vi) Yes.

4. GENERAL:
   (i) Germination good. Growth normal. (ii) Tikka and aphids trouble. Damage was negligible, hence no control measures taken. (iii) Height and spread measurements at intervals of 15 days, pod and fodder yield. (iv) (a) 1951—contd. (modified in 1957). (b) and (c) No. (v) (a) and (b) N.A. (vi) Crop was affected due to lack of rains. (vii) Nil.

5. RESULTS:
   (i) 561 lb./ac. (ii) 119.2 lb./ac. (iii) Main effect of S is highly significant and interaction S × R is significant. (iv) Av. yield of pod in lb./ac.

<table>
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S.E. of R marginal mean = −34.4 lb./ac.
S.E. of S marginal mean = 29.8 lb./ac.
S.E. of body of table = 59.8 lb./ac.
Crop: Groundnut (Kharif).

Site: Central Expt. Stn., Junagadh.

Object: To find out the optimum spacing between rows and between plants for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 9.7.1958. (iv) (a) 1 harrowing. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) Punjab—1 'medium'. (vii) Unirrigated. (viii) 3 interculturings and 2 weedings. (ix) 34'. (x) 18.11.1958.

2. TREATMENTS:
   Same as in expt. no. 57(48) on page 351.

3. DESIGN:
   (i) R.B.D. (ii) [a] 12. [b] N.A. (iii) 4. (iv) (a) 50'×12'. (b) 45'×6'. (c) 2.5'×3'. (v) Yes.

4. GENERAL:
   (i) Good. (ii) Incidence of tikka. No control measures taken. (iii) Pod yield. (iv) [a] 1951—contd modified in 1957. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1015 lb./ac. (ii) 141.3 lb./ac. (iii) Only effect of R is highly significant. (iv) Av. yield of pods in lb./ac.

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Mean 958 905 1136 1063 1015

S.E. of R marginal mean = 40.8 lb./ac.
S.E. of S marginal mean = 35.3 lb./ac.
S.E. of body of table = 70.7 lb./ac.
Crop: Groundnut (Kharif).

Site: Central Expt. Sta., Junagadh.

Object: To find out the optimum spacing between rows and between plants for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) N.A. (iv) (a) 2-3 ploughings and harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 1 seed/dibble. (v) 5 C.L./ac. of F.Y.M. applied in furrows 15 days before sowing. (vi) AK—12-24 (medium). (vii) Un-irrigated. (viii) 2 interculturings and 3 weedings. (ix) 21.93”. (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 55(27) on page 345.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 50’×12’. (b) 44’×6’. (v) 3’×3’. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Pod and fodder yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 987 lb./ac. (ii) 128.7 lb./ac. (iii) Effects of R and S are highly significant. Interaction is not significant. (iv) Av. yield of pod in lb./ac.

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S.E. of R marginal mean = 30.3 lb./ac.
S.E. of S marginal mean = 37.2 lb./ac.
S.E. of body of table = 52.5 lb./ac.
1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) N.A. (iv) (a) 3 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 1 seed/dibble. (v) 5 C.L./ac. of F.Y.M. applied in furrows 15 days before sowing. (vi) AK—12-24 (bunch type). (vii) Unirrigated. (viii) 2-3 interculturings and 3-4 weedings. (ix) 59.56. (x) N.A.

2. **TREATMENTS:**
   Same as in expt. no. 55(27), on page 345.

3. **DESIGN:**
   (i) Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 50'X12'. (b) 44'X6'. (v) 3'X3'. (vi) Yes.

4. **GENERAL:**
   (i) Germination and growth normal. (ii) Tikka and aphids attack—damage negligible. No control measures taken. (iii) Height and spread at the interval of 15 days. (iv) (a) 1955—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 938 lb./ac. (ii) 73.79 lb./ac. (iii) Main effects of R and S are highly significant. (iv) Av. yield of pod in lb./ac.

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</table>

S.E. of R marginal mean = 21.30 lb./ac.
S.E. of R marginal mean = 26.69 lb./ac.
S.E. of body of table = 36.89 lb./ac.

---

**Crop:** Groundnut (Kharif).

**Site:** Central Expt. Stn., Junagadh.

**Ref:** Gj. 57(49).

**Type:** 'C'.

Object:—To determine the optimum spacing between rows and between plants for Groundnut.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 12.7.1957. (iv) (a) 2 to 3 harrowings. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 1 seed/dibble. (v) 10 C.L./ac. of F.Y.M. in furrows 15 days before sowing. (vi) AK—12-24 (bunch type). (vii) Unirrigated. (viii) 2 interculturings and 2 to 3 weedings. (ix) 30.21. (x) 18.10.1957.

2. **TREATMENTS:**
   Same as in expt. no. 57(48) on page 351.

3. **DESIGN:**
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 63'X12'. (b) 60'X6'. (v) 14'X3'. (vi) Yes.

4. **GENERAL:**
   (i) Germination good and growth normal. (ii) Aphids and tikka attack—damage negligible. No control measures taken. (iii) Height and spread at the interval of 15 days. (iv) (a) 1955—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) Crop damaged due to no rains after first fortnight of August. (vii) Nil.

5. **RESULTS:**
   (i) 725 lb./ac. (ii) 116.1 lb./ac. (iii) Main effect of R is highly significant and effect of S is significant. (iv) Av. yiel of pod in lb./ac.
Object:—To find out the optimum spacing between plants and between rows for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 13.7.1958.
   (iv) (a) I harrowing. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) A.K.—12-24 (medium). (vii) Unirrigated. (viii) 3 interculturings and 2 weedings. (ix) 34°. (x) 6.11.1958.

2. TREATMENTS:
   Same as in exp. no. 57(48) on page 351.

3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 63' x 12'. (b) 60' x 6'. (v) 1.5' x 6'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Incidence of tikka. No control measures taken. (iii) Pod yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1153 lb./ac. (ii) 182.6 lb./ac. (iii) Only effect of R is highly significant. (iv) Av. yield of pod in lb./ac.

---

Crop :- Groundnut (Kharif).
Site :- Central Expt. Stn., Junagadh.
Ref :- Gj. 58(39).
Type :- 'C'.

Object:—To find out the optimum spacing between rows and between plants for Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 2.7.1959.
   (iv) (a) I ploughing. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 2 plants/dibble. (f) Nil. (vi) A.K.—
2. TREATMENTS:
Same as in expn. no. 57; 48, on page 351.

3. DESIGN:
(i) R.B.D. (ii) a; 12. (b) 63 × 14'. (iii) 4. (iv) (a) 63 × 12'. (b) 60 × 6'. (v) 1.5' × 3'. (vi) Yes.

4. GENERAL:
(i) Not satisfactory. (ii) Heavy attack of tikka. (iii) Pod and top yield. (iv) (a) 1955—contd. (b) No. (c) Nil. (v) a) and (b) N.A. (vi) Abnormal season. (vii) Nil.

5. RESULTS:
(i) 297 lb./ac. (ii) 133.2 lb./ac. (iii) Main effect of R alone is highly significant. (iv) Av. yield of pod in lb./ac.

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<tr>
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</table>

S.E. of R marginal mean = 38.5 lb./ac.
S.E. of S marginal mean = 33.3 lb./ac.
S.E. of body of table = 66.6 lb./ac.

---

Crop :- Groundnut (Kharif).
Site :- Agri. Res. Stn., Talod.
Ref :- Gj. 58(57).
Type :- 'C'.

Object :- To find out suitable spacing between rows and seed rate for Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Bajra. (c) N.A. (ii) (a) Sandy Garadu. (b) Refer soil analysis, Talod. (iii) 1.7.1958. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Samrala—1. (vii) Unirrigated. (viii) 3 interculturings and 3 weedings. (ix) 19.19". (x) 28 to 30.11.1958.

2. TREATMENTS:
Main-plot treatments:
3 row spacings: S₁ = 18", S₂ = 24" and S₃ = 30".
Sub-plot treatments:
3 seed rates: R₁ = 60, R₂ = 80 and R₃ = 100 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 24' × 30' (S₁ and S₂) and 23' × 30' (S₃). (b) 18' × 24'. (v) 3' × 3' (S₁ and S₂) and 2.5' × 3' (S₃). (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Pod yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2294 lb./ac. (ii) (a) 244.1 lb./ac. (b) 228.2 lb./ac. (iii) Main effect of R alone is significant. (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
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Mean 2271 2285 2327 2294
S.E. of difference of two

1. S marginal means = 81.5 lb./ac.
2. R marginal means = 76.1 lb./ac.
3. R means at the same level of S = 131.8 lb./ac.
4. S means at the same level of R = 134.9 lb./ac.

Crop :- Groundnut (Kharif).

Object :- To find out the optimum time of sowing for Groundnut.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) 20 lb./ac. of N as A/S.
   (iv) (a) Medium black. (b) Refer soil analysis, Umrada.
   (iii) As per treatments. (iv) (a) 2 ploughings and 2 harrowings.
   (b) to (e) N.A. (v) 20 lb./ac. of N as A/S + 32 lb./ac. of P2O5 as Super.
   (vi) AK = 12-24 (bunch type). (vii) Unirrigated. (viii) 3 interculturings and 2 weedings.
   (x) 34'. (x) 30.9.1957.

2. TREATMENTS :
   and D5 = 13.7.1957.

3. DESIGN :
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 40'X12'. (b) 36'X6'. (v) 2'X3'. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Tikka attack. (iii) Pod yield. (iv) (a) 1956-1957. (b) and (c) No. (v) (a) and (b) N.A.
   (vi) and (vii) Nil.

5. RESULTS :
   (i) 940 lb./ac. (ii) 166.3 lb./ac. (iii) Treatment differences are highly significant.
   (iv) Av. yield of pod in lb./ac.

   Treatment | D1 | D2 | D3 | D4 | D5 |
   Av. yield  | 1168 | 1168 | 933 | 664 | 769 |
   S.E./mean  = 67.9 lb./ac.

Crop :- Groundnut (Kharif).

Object :- To study the effect of different manurial doses along with spacings on Groundnut.

1. BASAL CONDITIONS :
   (i) (a) Groundnut—Bajra. (b) Bajra. (c) 35 lb./ac. of manure mixture.
   (ii) (a) Medium black. (b) Refer soil analysis, Amreli.
   (iii) 8.7.1958. (iv) (a) N.A. (b) Dibbling. (c) N.A. (d) As per treatments.
   (x) N.A.

2. TREATMENTS :
   Main-plot treatments :
   All combinations of (1) and (2)
   (1) 2 spacings between plants : S1 = 2' and S2 = 4'.
   (2) 3 spacings between rows : R1 = 18', R2 = 24' and R3 = 36'.
   Sub-plot treatments :
   All combinations of (1) and (2)
   (1) 3 levels of P2O5 : P0 = 0, P1 = 27 and P2 = 54 lb./ac.
   (2) 2 levels of K2O : K0 = 0 and K1 = 27 lb./ac.
3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/repetition; 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 40' x 12'. (b) 3' x 3'. (v) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Pod yield. (iv) (a) 1958—1960. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1093 lb./ac. (ii) (a) 518.4 lb./ac. (b) 142.0 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of pod in lb./ac.

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<th>R₃</th>
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S.E. of difference of two
1. R marginal means = 122.19 lb./ac. 8. R means at the same level of P = 131.00 lb./ac.
2. S marginal means = 99.77 lb./ac. 9. K means at the same level of S = 38.64 lb./ac.
3. P marginal means = 33.47 lb./ac. 10. K means at the same level of R = 47.33 lb./ac.
4. K marginal means = 27.33 lb./ac. 11. S means at the same level of K = 103.40 lb./ac.
5. P means at the same level of S = 47.33 lb./ac. 12. R means at the same level of K = 126.70 lb./ac.
6. P means at the same level of R = 57.97 lb./ac. S.E. of body of P x K table = 35.81 lb./ac.
7. S means at the same level of P = 106.9 lb./ac. S.E. of body of R x S table = 122.20 lb./ac.

Crop :- Groundnut (Kharif).
Ref :- Gj. 59(65).
Type :- CM.

Object :- To study the effect of different manural doses along with spacings on Groundnut.

1. BASAL CONDITIONS:
(i) (a) Groundnut—Bajra. (b) Bajra. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 1st week of July, 1959. (iv) (a) N.A. (b) Dibbling. (c) N.A. (d) As per treatments. (e) 2 seeds/dibble. (v) 5 C.L./ac. of F.Y.M. (vi) A.H.—32. (vii) Unirrigated. (viii) N.A. (ix) 45.56'. (x) N.A.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 58(79) on page 357.

4. GENERAL:
(i) and (ii) N.A. (iii) Pod and top yield. (iv) (a) 1958—1960. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 534 lb./ac. (ii) (a) 205.2 lb./ac. (b) 71.32 lb./ac. (iii) Effects P and R are highly significant. Others are not significant. (iv) Av. yield of pod in lb./ac.

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<th>( R_3 )</th>
<th>( K_0 )</th>
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</table>

S.E. of difference of two

1. R marginal means = 48.37 lb./ac.
2. S marginal means = 39.49 lb./ac.
3. P marginal means = 16.81 lb./ac.
4. K marginal means = 13.72 lb./ac.
5. P means at the same level of S = 23.77 lb./ac.
6. P means at the same level of R = 29.12 lb./ac.
7. S means at the same level of P = 44.00 lb./ac.

Crop : - Groundnut (Kharif).

Ref : - Gj. 58(77).
Type : - 'CM'.

Object : - To study the effect of different manurial doses along with spacings on Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton. (b) Bajra. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (ii) 12.7.1958. (iv) (a) 1 ploughing and 4 harrowings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) A.K.—12-24. (vii) Irrigated. (viii) 2 weedings and 2 interculturings. (ix) 13.10.1958.
   (x) 27.10.1958.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 58(79) on page 357.
   Manures broadcast before sowing.

4. GENERAL:
   (i) Unsatisfactory. (ii) Tikka disease. (iii) Pod yield. (iv) (a) 1958—contd. (b) N.A. (c) No. (v) (a) Junagadh, Umrala and Amreli. (b) Nil. (vi) and (vii) Nil.

5. RESULT S:
   (i) 552 lb./ac. (ii) (a) 139.7 lb./ac. (b) 87.97 lb./ac. (iii) Effects of P and R are highly significant and effect of S is significant. Others are not significant. (iv) Av. yield of pod in lb./ac.
Crop :- Groundnut.  
Ref :- Gj. 59(68).  
Type :- 'CM'.

Object :- To study the effect of different manurial doses along with spacings on Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Legume—Cereal—Cotton.  (b) Cotton.  (c) 5 C.L./ac. of compost+25 lb./ac. of manure mixture.
   (ii) (a) Medium black.  (b) Refer soil analysis, Halvad.  (iii) 3.7.1959.  (iv) (a) 2 harrowings.  (b) Dibbling.
   (c) N.A.  (d) As per treatments.  (e) N.A.  (v) 10 C.L./ac. of compost broadcast.  (vi) A.K.—12-24.  (vii) Unirrigated.  (viii) 3 interculturings and 4 weedings.  (ix) 34.32°.  (x) 17.1°. 1959.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 58(79) on page 357.

4. GENERAL:
   (i) Normal.  (ii) Serious attack of tikka. Slight attack of grass-hoppers.  (iii) Pod and top yield.  (iv) (a) 1958—cond.  (b) and (c) No.  (v) (a) Umrala, Jamnagar and Amreli.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1095 lb./ac.  (ii) (a) 237.0 lb./ac.  (b) 160.5 lb./ac.  (iii) Effects of P is significant and effect of R is highly significant. Interaction R×P is significant while all the other effects are not significant.  (iv) Av. yield of pod in lb./ac.

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<th>R₃</th>
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K₀  K₁  S₁  S₂  Mean
629  439  590
643  462  549

S.E. of difference of two
1. R marginal means = 32.93 lb./ac.
2. S marginal means = 26.89 lb./ac.
3. P marginal means = 20.73 lb./ac.
5. P means at the same level of S = 29.32 lb./ac.
6. P means at the same level of R = 35.91 lb./ac.
7. S means at the same level of P = 36.00 lb./ac.
8. R means at the same level of P = 44.09 lb./ac.
9. K means at the same level of S = 23.94 lb./ac.
10. K means at the same level of R = 31.79 lb./ac.
11. S means at the same level of K = 38.91 lb./ac.
12. R means at the same level of K = 36.00 lb./ac.
S.E. of difference of two
1. R marginal means = 55.86 lb./ac.  8. R means at the same level of P = 77.35 lb./ac.
2. S marginal means = 45.61 lb./ac.  9. K means at the same level of S = 43.68 lb./ac.
3. P marginal means = 37.83 lb./ac.  10. K means at the same level of R = 53.50 lb./ac.
4. K marginal means = 30.89 lb./ac.  11. S means at the same level of K = 55.09 lb./ac.
5. P means at the same level of S = 53.50 lb./ac.  12. R means at the same level of K = 67.46 lb./ac.
6. S means at the same level of P = 63.15 lb./ac.  S.E. of body of R x K table = 38.15 lb./ac.
7. R means at the same level of P = 77.35 lb./ac.  S.E. of body of K x S table = 31.15 lb./ac.
8. R means at the same level of R = 65.52 lb./ac.  S.E. of body of K x R x S table = 66.08 lb./ac.
9. K means at the same level of S = 53.95 lb./ac.  S.E. of body of S x K table = 44.05 lb./ac.
10. K means at the same level of P = 53.50 lb./ac.  S.E. of body of P x K table = 37.83 lb./ac.

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Crop: Groundnut (Kharif).

Site: Central Expt. Sta., Junagadh.

Ref: Gj. 58(40).

Type: 'CM'.

Object: To study the effect of different manurial doses along with spacings on Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) Nil.  
   (ii) (a) Medium black and loamy. (b) Refer soil analysis, Junagadh.  
   (iii) 1958.  
   (iv) (a) 1 harrowing. (b) and (c) N.A.  
   (v) Punjab—1 (medium).  
   (vi) Unirrigated.  
   (vii) Nil.  
   (viii) 34'.  
   (ix) 16.11.1958.

2. TREATMENTS:
   All combinations of (1), (2), (3) and (4)
   (1) 3 levels of P2O5: P0=0, P1=27 and P2=54 lb./ac.
   (2) 2 levels of K2O: K0=0 and K1=27 lb./ac.
   (3) 2 spacings between plants : S1=2' and S2=4'.
   (4) 3 spacings between rows: R1=18', R2=24' and R3=36'.

3. DESIGN:
   (i) Fait. in R.B.D.  
   (ii) (a) 36'. (b) N.A.  
   (iii) 2.  
   (iv) (a) 40'x12'. (b) 36'x6'. (v) 2'x3'. (vi) Yes.

4. GENERAL:
   (i) Good.  
   (ii) Attack of tikka. No control measures taken.  
   (iii) Pod: yield.  
   (iv) (a) 1958—ccnd. (b) No. (c) Nil.  
   (v) (a) Halvad and Umrala. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1289 lb./ac. (ii) 186.9 lb./ac.  
   (iii) Main effect of P is highly significant. No other effect is significant.  
   (iv) Av. yield of pod in lb./ac.

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<th>S1</th>
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S.E. of P or R marginal means = 38.15 lb./ac.
S.E. of K or S marginal means = 31.15 lb./ac.
S.E. of body of P x R table = 66.08 lb./ac.
S.E. of body of P x K or S or R x K or S table = 53.95 lb./ac.
S.E. of body of S x K table = 44.05 lb./ac.
Crop: Groundnut (Kharif).
Site: Central Expt. Sta., Junagadh.

Object: To study the different manurial doses along with spacings on Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil.  
   ii) (a) Medium black. (b) Refer soil analysis, Junagadh. 
   (iii) 10.7.1959. 
   (iv) (a) Nil. (b) Dibbling. (c) N.A. 
   (v) Unirrigated. (vi) 1 interculturing and 3 weedings. 
   (vii) 60.42". (viii) 14.11.1959.

2. TREATMENTS:
   Main-plot treatments: 
   All combinations of (1), (2); (3) and (4) 
   (1) 3 levels of N as A/S: N0 = 0, N1 = 10 and N2 = 20 lb./ac. 
   (2) 3 levels of P2O5 as Super: P0 = 0, P1 = 25 and P2 = 50 lb./ac. 
   (3) 3 levels of K2O as Pot. Sul.: K0 = 0, K1 = 25 and K2 = 50 lb./ac. 
   (4) 3 spacings: S1 = 18" x 2", S2 = 24" x 4" and S3 = 36" x 2". 

Sub-plot treatments: 
   2 levels of F.Y.M.: F0 = 0 and F1 = 10 C.L./ac.

3. DESIGN:
   (i) 3 x 2 split-plot confd. (ii) A 9 main-plots block, 9 blocks, replication and 2 sub-plots/main-plot. 
   (iii) 1. (iv) A 36" x 24". (v) 30" x 18". (vi) 3" x 3". (vii) Yes.

4. GENERAL:
   (b) No. (c) Nil. (v) (a) Talod. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 368 lb./ac. (ii) (a) 231.5 lb./ac. (b) 93.42 lb./ac. (iii) Interaction S x F is highly significant and interaction N x F is significant. No other effect is significant. (iv) Av. yield of pod in lb./ac.

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S.E. of difference of two
1. P, K, N or S marginal means = 44.55 lb./ac.
2. F marginal means = 14.66 lb./ac.
3. F means at the same level of P, K, N or S = 25.43 lb./ac.
4. P, K, N or S means at the same level of F = 48.01 lb./ac.

S.E. of body of P x N, P x K or P x S table = 54.57 lb./ac.
**Crop:** Groundnut *(Kharif)*  
**Site:** Agri. Res. Stn., Talod.  
**Ref:** Gj. 59(83).  
**Type:** ‘CM’.  

Object:—To study the effect of different manurial doses along with spacing on Groundnut.

1. **BASAL CONDITIONS:**
   (i) (a) Nil.  (b) *Mug, Bajra* and *Jowar.*  (c) 5 C.L./ac. of F.Y.M.  (ii) (a) Sandy.  (b) Refer soil analysis, Talod.  (iii) 1.7.1959.  (iv) (a) 1 ploughing and 2 harrowings.  (b) N.A.  (c) 60 lb./ac.  (d) As per treatments.  (e) N.A.  (v) Nil.  (vi) Samrala—1 (late).  (vii) Unirrigated.  (viii) 4 interculturings and 3 weedings.  (ix) 53.68’.

2. **TREATMENTS:**
   **Main-plot treatments:**
   All combinations of (1), (2), (3) and (4)
   (1) 3 levels of N as A/S: N₀ =0, N₁ =10 and N₂ =20 lb./ac.
   (2) 3 levels of P₂O₅ as Super: P₀ =0, P₁ =25 and P₂ =50 lb./ac.
   (3) 3 levels of K₂O as Pot. Sul.: K₀ =0, K₁ =25 and K₂ =50 lb./ac.
   (4) 3 spacings between rows: S₁ =18”, S₂ =24” and S₃ =30”.

   **Sub-plot treatments:**
   2 levels of F.Y.M.: F₀ =0 and F₁ =5000 lb./ac.

3. **DESIGN:**
   (i) 3⁴ x 2 split-plot confounded.  (ii) (a) 9 main-plots/block, 9 blocks/replication and 2 sub-plots/main-plot.  (b) N.A.  (iii) 1.  (iv) (a) 36’ X21’ (S₁ and S₂) and 35’ X21’ (S₃).  (b) 30’ X15’.  (v) N.A.  (vi) Yes.

4. **GENERAL:**
   (i) No.  (ii) Attack of collar-rot and white-ant.  (iii) Pod and top yield.  (iv) (a) 1959—contd.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 936 lb./ac.  (ii) (a) 277.8 lb./ac.  (b) 143.8 lb./ac.  (iii) Main effect of K is highly significant while effect of S is significant. No other effect is significant.  (iv) Av. yield of pod in lb./ac.

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S.E. of difference of two
1. P, K, N or S marginal means = 53.46 lb./ac.
2. F marginal means = 22.60 lb./ac.
3. F means at the same level of P, K, N or S = 39.13 lb./ac.
4. P, K, N or S means at the same level of F = 60.20 lb./ac.
S.E. of body of P X N, P X K or P X S table = 65.48 lb./ac.
Objective: To study the effect of different manorial doses along with spacings on Groundnut.

1. BASAL CONDITIONS:

   (i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 15.7.1958. (iv) (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c) N.A. (d) As per treatments. (e) N.A. (f) Nil. (v) A.K.—12.14. (vi) Unirrigated. (vii) 2 weedings and 1 interculturing. (viii) N.A. (x) 30.10.1958.

2. TREATMENTS:

   Main-plot treatments:
   3 spacings between rows: $R_1 = 18''$, $R_2 = 24''$ and $R_3 = 36''$.

   Sub-plot treatments:
   2 spacings between plants: $S_1 = 2''$ and $S_2 = 4''$.

   Sub-sub-plot treatments:
   All combinations of (1) and (2).

   (1) 3 levels of $P_2O_5$ as Super: $P_0 = 0$, $P_1 = 27$ and $P_2 = 54$ lb./ac.
   (2) 2 levels of $K_2O$ as Pot. Sul.: $K_0 = 0$ and $K_1 = 27$ lb./ac.

   $P_2O_5$ and $K_2O$ applied in furrows at sowing.

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**Crop:** Groundnut (Kharif).  
**Site:** Agri. Res. Stn., Umrala.  
**Ref:** Gj. 56(110).  
**Type:** ‘CM’.

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**Crop:** Groundnut (Kharif).  
**Site:** Agri. Res. Stn., Umrala.  
**Ref:** Gj. 58(93).  
**Type:** ‘CM’.

Object: To study the effect of different manorial doses along with spacings on Groundnut.
3. DESIGN:
(i) Split-plot.  
(ii) (a) 3 main-plots/replication; 2 sub-plots/main-plot; 6 sub-sub-plots/sub-plot. (b) N.A.
(iii) 3.  
(iv) (a) $30' \times 12'$; (b) $34' \times 6'$. (v) $3' \times 3'$. (vi) Yes.

4. GENERAL:
(i) Normal.  
(ii) Attack of aphids but washed away by heavy rains on 26th and 27th August 1958. (iii) Pod yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1365 lb./ac.  
(ii) (a) 848.8 lb./ac. (b) 431.5 lb./ac. (c) 141.2 lb./ac. (iii) Main effect of $S$ highly significant. Effect of $R$ is significant. Other effects are not significant. (iv) Av. yield of pod in lb./ac.

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<th></th>
<th>$K_0$</th>
<th>$K_1$</th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_3$</td>
<td>1500</td>
<td>1858</td>
<td>1879</td>
<td>1745</td>
<td>1879</td>
<td>1870</td>
</tr>
<tr>
<td></td>
<td>1048</td>
<td>1186</td>
<td>1330</td>
<td>1188</td>
<td>1153</td>
<td>1283</td>
</tr>
<tr>
<td></td>
<td>1040</td>
<td>1164</td>
<td>1278</td>
<td>1161</td>
<td>1190</td>
<td>1235</td>
</tr>
<tr>
<td>$K_0$</td>
<td>1621</td>
<td>1611</td>
<td>1621</td>
<td>1621</td>
<td>1611</td>
<td>1621</td>
</tr>
<tr>
<td>$K_1$</td>
<td>1093</td>
<td>1223</td>
<td>1093</td>
<td>1093</td>
<td>1223</td>
<td>1093</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. R marginal means $= -200.01$ lb./ac.  
2. S marginal means $= 83.04$ lb./ac.  
3. P marginal means $= 33.28$ lb./ac.  
4. K marginal means $= 27.17$ lb./ac.  
5. K means at the same level of $S = 38.42$ lb./ac.  
6. K means at the same level of $R = 57.64$ lb./ac.  
7. S means at the same level of $R = 47.07$ lb./ac. S.E. of body of $P \times K$ table $= 33.3$ lb./ac.

Crop : Groundnut (Kharij).  
Ref : Gj. 59(102).  
Type : 'CM'.

Object :--To study the effect of different manurai doses along with spacing on Groundnut.

1. BASAL CONDITIONS:
- (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Umrala. (iii) 5.7.1959. (iv) (a) 1 ploughing and 2 harrowings. (b) Dibbling. (c) 80 lb./ac. (d) As per treatments. (e) N.A. (f) Nil. (vi) AK—12-24. (vii) Unirrigated. (viii) Nil. (IX) 25.98'. (X) 4.11.1959.

2. TREATMENTS and 3. DESIGN: 
Same as in expt. no. 58(93) on page 364.

4. GENERAL:
- (i) Fair. (ii) Nil. (iii) Pod yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
- (i) 540 lb./ac.  
  (ii) (a) 505.4 lb./ac. (b) 120.2 lb./ac. (c) 76.66 lb./ac. (iii) Interaction $S \times P$ acre is highly significant. (iv) Av. yield of pod in lb./ac.

---

Crop : Groundnut (Kharij).  
Ref : Gj. 59(102).  
Type : 'CM'.

Object : To study the effect of different manurai doses along with spacing on Groundnut.
Crop :- Groundnut (Kharif).


Ref :- Gj. 54(39).

Type :- 'I'.

Object :- To find out the number of irrigations required in this tract to get better yield of Groundnut.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 8.7.1954. (iv) (a) 2 harrowings and 2 interculturings. (b) N.A. (d) and (e) N.A. (v) 8 lb./ac. of \(P_2O_5\) at the time of sowing and 20 lb./ac. of N in the form of manure mixture + A/S top dressed 3 weeks after sowing. (vi) A.H.-32 (early). (vii) As per treatments. (viii) 3 interculturings, 3 weedings and harrowing. (x) 25.10.1954.

2. TREATMENTS :
   1. No irrigation.
   2. One irrigation.
   3. Two irrigations.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) 51'×18'. (b) 45'×12'. (v) Two rows length wise and 3' distance breadth wise. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) Nil. (iii) Average height, width of plants in inches and pod yield. (iv) (a) 1954—N.A. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
   (i) 626.7 lb./ac. (ii) 71.79 lb./ac. (iii) Treatment differences are not significant, (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>655.6</td>
<td>583.4</td>
<td>649.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>29.04 lb./ac</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Groundnut (Kharif).
Ref: Gj. 58(101).
Type: 'DM'.

Object: To study the effect of sulphur dusting on the control of tikka disease of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Shallow, light black. (b) Refer soil analysis, Amreli. (iii) 9.7.1958.
   (iv) (a) 1 harrowing. (b) Drilling. (c) 60 lb./ac. (d) 18' between rows. (e) —. (v) 5 C.L./ac. of F.Y.M

2. TREATMENTS:
   1. Control.
   2. 3 dustings of 15 lb./ac. of sulphur, 1, 1½ and 2 months after sowing.

3. DESIGN:
   (i) R.B.D. (ii) 2. (b) N.A. (iii) 12. (iv) (a) 33'×18'. (b) 30'×15'. (v) 1.5'×1.5'. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Pod yield. (iv) (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1512 lb./ac. (ii) 67.43 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of pod
   in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1420</td>
<td>1604</td>
<td>=19.47 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Groundnut (Kharif).
Ref: Gj. 59(90).
Type: 'DM'.

Object: To study the effect of sulphur dusting to control tikka disease of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Shallow, light black. (b) Refer soil analysis, Amreli. (iii) 3.7.1959.
   (iv) (a) 4 harrowings. (b) Drilling. (c) 60 lb./ac. (d) 18' between rows. (e) —. (v) 5 C.L./ac. of F.Y.M
   (vi) A.H.—32. (vii) Unirrigated. (viii) 3-4 interculturings and 2 weedings. (ix) 45.56'. (x) 23.10.1959.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no 58(101) above.

4. GENERAL:
   (i) Due to heavy rains, there was more of vegetative growth than pod yields. (ii) Nil. (iii) Pod yield. (iv)
   (a) 1958—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Excessive rain in October. (vii) Nil.

5. RESULTS:
   (i) 1625 lb./ac. (ii) 81.66 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of pod
   in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1521</td>
<td>1730</td>
<td>=23.57 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Lang (Rabi).
Ref: Gj. 54(20).
Type: 'M'.

Object: To study the effect of leguminous crop Lang with and without P₂O₅ on succeeding cereal crop Jowar.
1. BASAL CONDITIONS:
(i) (a) N.A. (b) Jowar. (c) N.A. (d) Medium black. (e) N.A. (iii) 15.10.1954. (iv) (a) N.A. (b) Drilling. (c) 40 lb./ac. (d) 2' between rows; between plants-irregular. (e) N.A. (vi) Nil. (vi) Lang. (vii) Unirrigated. (viii) 1 weeding. (ix) 29.31'. (x) 19.1.1955.

2. TREATMENTS:
1. 0 lb./ac. of P₂O₅ as Super.
2. 50 lb./ac. of P₂O₅ as Super.
3. 100 lb./ac. of P₂O₅ as Super.
4. 150 lb./ac. of P₂O₅ as Super.
5. Fallow.
Time and method of application—N.A.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 48' × 24'. (b) 44' × 20'. (v) 2' × 2'. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain and fodder yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (d) and (e) Nil. and (f) No. (vi) and (vii) Nil.

5. RESULTS:
(i) 7 lb./ac. (ii) 82.5 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>741</td>
<td>707</td>
<td>685</td>
<td>742</td>
</tr>
<tr>
<td>S.E., mean</td>
<td>-36.89 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Garlic (Rabi).
Object: To find out optimum spacing for Garlic.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.
   (ii) (a) Medium black.
   (iii) 10.11.1955.
   (iv) (a) N.A.
   (v) (a) Sann as G.M.
   (vi) Nil.
   (vii) Irrigated.
   (viii) Nil.
   (ix) 12.29°.
   (x) 2.3.1956.

2. TREATMENTS:
   4 spacings between rows: $S_1=3'$, $S_2=4\frac{1}{2}'$, $S_3=6'$, $S_4=9'$ and $S_5$ = Cross-wise sowing with 18' seed drill (local method).

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

4. GENERAL:
   (i) Normal.
   (ii) N.A.
   (iii) Garlic yield.
   (iv) (a) and (b) N.A.
   (c) Nil.
   (v) (a) and (b) N.A.
   (vi) N.A.
   (vii) Plot-wise yield—N.A.

5. RESULTS:
   (i) 2987 lb./ac.
   (ii) Treatment differences are highly significant.
   (iv) Av. yield of garlic in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
<th>$S_5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2962</td>
<td>3538</td>
<td>3151</td>
<td>2651</td>
<td>2632</td>
</tr>
<tr>
<td>S.E./mean = N.A.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Tobacco (Kharif).
Site: Instt. of Agriculture, Anand.
Object: To find out suitable dose of N for Bidi-Tobacco when field is green manured with and without P$_2$O$_5$.

1. BASAL CONDITIONS:
   (i) (a) Nil.
   (b) Jowar.
   (c) N.A.
   (ii) (a) Black soil.
   (b) Refer soil analysis, Anand.
   (iii) 31.8.1957.
   (iv) (a) 4 ploughings and 3 harrowings.
   (b) Transplanting.
   (c) —.
   (d) 3' x 3'.
   (e) N.A.
   (v) Nil.
   (vi) Kelp—49.
   (vii) Irrigated.
   (viii) 4 interculturings and 2 weedings.
   (ix) 21.00°.
   (x) 19.1.1958.

2. TREATMENTS:
   Main-plot treatments:
   2 level of P$_2$O$_5$ as Super: $P_0=0$ and $P_1=30$ lb./ac. of P$_2$O$_5$.
   Sub-plot treatments:
   3 levels of N as G.N.C.: $N_1=80$, $N_2=120$ and $N_3=160$ lb./ac.
   Sann as G.M. applied in main-plots.

3. DESIGN:
   (i) Split-plot.
   (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot.
   (b) N.A.
   (iii) 4.
   (iv) (a) 48' x 45'.
   (b) 36' x 33'.
   (v) 6' x 6'.
   (vi) Yes.

4. GENERAL:
   (i) N.A.
   (ii) Nil.
   (iii) Cured tobacco yield.
   (iv) (a) 1957—contd.
   (b) No.
   (c) Nil.
   (d) N.A.
   (v) (a) and (b) Nil.
   (vi) Nil.
   (vii) Plot-wise yield data—N.A.

5. RESULTS:
   (i) 1341 lb./ac.
   (ii) (a) N.A.
   (b) N.A.
   (iii) Only N effect is significant.
   (iv) Av. yield of cured tobacco in lb./ac.
Object: To find out suitable dose of N for Bidi-Tobacco when the field is green manured with and without P₂O₅.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Bajra. (c) N.A. (ii) (a) Black soil. (b) Refer soil analysis, Anand. (iii) 30.8.1959. (iv) (a) 3 ploughings and 3 harrowings. (b) Transplanting. (c) --. (d) 3'X3'. (e) N.A. (v) Nil. (vi) Keliu—49. (vii) Irrigated. (viii) 3 interculturings and 2 weedings. (ix) 5.10.60. (x) 19.1.1960.

2. TREATMENTS:
Same as in exp. no. 57:128; on page 369.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 48'X45'. (b) 36'X33'. (v) 6'X6'. (vi) No.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Cured tobacco yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Plot-wise yield data N.A.

5. RESULTS:
(i) 1351 lb./ac. (ii) (a) N.A. (b) N.A. (iii) Only N effect is significant. (iv) Av. yield of cured tobacco in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1241</td>
<td>1301</td>
<td>1512</td>
<td>1351</td>
</tr>
<tr>
<td>1179</td>
<td>1335</td>
<td>1545</td>
<td>1353</td>
</tr>
</tbody>
</table>

S.E's = N.A.
2. TREATMENTS:
   Same as in expt. no. 57(128) on page 369.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 48’x45’; (b) 36’x33’; (v) 6’x6’. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil. (iii) Cured tobacco yield. (iv) (a) 1957—contd. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) Nil. (vii) Plot wise yield data N.A.

5. RESULTS:
   (i) 993 lb/ac. (ii) (a) and (b) N.A. (iii) Only N effect is significant. (iv) Av. yield of cured tobacco in lb/ac.

\[
\begin{array}{ccc|c}
   & N_1 & N_2 & N_3 & \text{Mean} \\
   P_0 & 730 & 1024 & 1147 & 867 \\
   P_1 & 849 & 1036 & 1173 & 1019 \\
   \text{Mean} & 790 & 1030 & 1160 & 993 \\
  \text{S.E.’s} & = & N.A. & \\
\end{array}
\]

Crop :- Jowar (Kharif).
Site :- Agri. Res. Stn., Harij.
Object :- To determine the suitable dose of sulphur for Jowar fodder.

Ref :- Gj. 56(38).
Type :- ‘M’.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Salty. (b) Refer soil analysis, Harij. (iii) 27.9.1956. (iv) 2 harrowings and 1 ploughing. (b) Drilling. (c) 50 lb/ac. (d) 12”x1”. (e) N.A. (v) Nil. (vi) Sundia (fodder) (vii) Unirrigated. (viii) Nil. (ix) 36.82”. (x) 17.11.1956.

2. TREATMENTS:
   1. Control.
   2. ½ ton/ac. of Sulphur.
   3. 1 ton/ac. of Sulphur.
   Time and method N.A.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 4. (iv) (a) and (b) 33’x16’’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Poor due to heavy and continuous rains. (ii) Nil. (iii) Fodder yield. (iv) (a) 1951—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Expt. was not conducted in 1955. (vii) Nil.

5. RESULTS:
   (i) 798 lb/ac. (ii) 70.24 lb/ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>914</td>
<td>757</td>
<td>723</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=</td>
<td>35.12 lb/ac.</td>
<td></td>
</tr>
</tbody>
</table>
1. **BASAL CONDITIONS**:
- (i) Nil. (b) Jowar. (c) Nil. (ii) Salty. (d) Refer soil analysis, Harij. (iii) 27.9.1956. (iv) (a) 2 ploughings and 1 harrowing. (b) Drilling. (c) 50 lb./ac. (d) 12" x 1". (e) N.A. (f) Nil. (g) S-1049 fodder. (h) Unirrigated. (i) Nil. (j) 1 hand weeding. (k) 17.11.1956.

2. **TREATMENTS and 3. DESIGN**:
Same as in exp. no. 56, 38) on page 371. Sulphur spread on 28.8.1958.

4. **GENERAL**:
- (i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1951—contd. (b) No. (c) Nil; (d) and (e) N.A. (f) and (g) Nil.

5. **RESULTS**:
(i) 1079 lb./ac. (ii) 171 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield (lb./ac.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1140</td>
</tr>
<tr>
<td>B</td>
<td>1050</td>
</tr>
<tr>
<td>C</td>
<td>1046</td>
</tr>
</tbody>
</table>

S.E./mean = 85.5 lb./ac.

**Crop:** Jowar (Kharif).
**Site:** Agri. Res. Stn., Harij.
**Ref:** Gj. 56(39).
**Type:** 'M'.

Object:—To determine the suitable dose of gypsum for Jowar fodder.

1. **BASAL CONDITIONS**:
- (i) (a) Nil. (b) N.A. (c) Nil. (ii) Salty. (b) Refer soil analysis, Harij. (iii) 28.8.1958. (iv) (a) 1 ploughing and 1 harrowing. (b) Drilling. (c) 50 lb./ac. (d) 12" x 1". (e) N.A. (f) Nil. (g) S—1049 fodder. (h) Unirrigated. (i) Nil. (j) 1 hand weeding. (k) 13.77". (l) 25.10.1958.

2. **TREATMENTS**:
- A. Control.
- B. 1 ton/ac. of Gypsum.
- C. 1 ton/ac. of Gypsum.

Time and method—N.A.

4. **GENERAL**:
(i) Poor due to heavy and continuous rains. (ii) Nil. (iii) Fodder yield. (iv) (a) 1951—contd. (b) No. (c) Nil; (d) and (e) N.A. (f) Expt. was not conducted in 1955. (g) Nil.

5. **RESULTS**:
(i) 1079 lb./ac. (ii) 171 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield (lb./ac.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1140</td>
</tr>
<tr>
<td>B</td>
<td>1050</td>
</tr>
<tr>
<td>C</td>
<td>1046</td>
</tr>
</tbody>
</table>

S.E./mean = 85.5 lb./ac.

**Crop:** Jowar (Kharif).
**Site:** Agri. Res. Stn., Harij.
**Ref:** Gj. 58(33).
**Type:** 'M'.

Object:—To determine the suitable dose of gypsum for Jowar fodder.
2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 56(39) on page 372.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1951—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1803 lb./ac. (ii) 309.6 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of fodder in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1920</td>
<td>1605</td>
<td>1885</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=184.8 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Crop:** Jowar (*Kharif*).  
**Site:** Agri. Res. Sta., Viramgam.  
**Ref:** Gj. 54(74).  
**Type:** 'M'.

Object:—To find the best source of N for Jowar fodder.

1. BASAL CONDITIONS:

(i) (a) Cotton—Jowar. (b) Cotton. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Alluvial and medium black. (b) Refer soil analysis, Viramgam. (iii) 9.7.1954. (iv) (a) 3 harrowings. (b) Drilling. (c) 30 lb./ac. (d) Between rows—18”; between plants—irregular. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) C—10-2 (fodder). (vii) Unirrigated. (viii) 1 interculturing. (ix) 27.32”. (x) 18.10.1954.

2. TREATMENTS:

A. Control.  
B. 60 lb./ac. of N as A/S  
C. 60 lb./ac. of N as A/S and G.N.C. (1 : 1).  
D. 60 lb./ac. of N as calcium cyanamide.  
E. 60 lb./ac. of N as G.N.C. and calcium cyanamide (1 : 1).  
N broadcast one month after sowing.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 80’×18’. (b) 72’×12’. (v) 2 rows on either side and 4’ at each end of the net plot. (vi) Yes.

4. GENERAL:

(i) Poor due to continuous and heavy rains. (ii) Light attack of red leaf blight and stigma. (iii) Fodder yield. (iv) (a) 1953—1954. (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 4336 lb./ac. (ii) 585.4 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of fodder in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>3378</td>
<td>5117</td>
<td>4865</td>
<td>4159</td>
<td>4159</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=292.7 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Crop:** Jowar.  
**Site:** Inst. of Agriculture, Anand.  
**Ref:** Gj. 55(94).  
**Type:** 'C'.

Object:—To study the effect of spacing and seed rate on Jowar fodder.
1. **BASAL CONDITIONS**:

   (i) (a) Nil. (b) Tobacco. (c) 1920 lb./ac. of GNC+480 lb./ac. of castor cake. (ii) (a) Black. (b) Refer soil analysis, Anand. (iii) 14.9.1955. (iv) (a) 1 ploughing and 4 harrowings. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Sundia—1049. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 8.12.1955.

2. **TREATMENTS**:

   - **Main-plot treatments**: 3 spacings between rows: $S_1=9''$, $S_2=12''$ and $S_3=15''$.
   - **Sub-plot treatments**: 3 seed rates: $R_1=40$, $R_2=60$ and $R_3=80$ lb./ac.

3. **DESIGN**:

   - i) Split-plot. (ii) (a) 3 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) $18\times36'$ ($S_1$), $19\times36'$ ($S_2$) and $20\times36'$ ($S_3$). (b) $15\times30'$. (v) N.A. (vi) Yes.

4. **GENERAL**:

   - (i) Good. (ii) Nil. (iii) Dry fodder yield. (iv) (a) 1955—1956. (b) Nil. (c) N.A. (v) (a) and (b); N.A. (vi) and (vi) Nil.

5. **RESULTS**:

   - (i) 5010 lb./ac. (ii) (a) 1045 lb./ac. (b) 664.6 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in lb./ac.

   ![Table](chart.png)

   **Crop**: Jowar.  
   **Site**: Inst. of Agriculture, Anand.  
   **Ref**: Gj. 59(90).  
   **Type**: 'C'.

Object: To study the effect of spacings and seed rates on Jowar.

1. **BASAL CONDITIONS**:

   (i) (a) Nil. (b) Cotton. (c) 10 C.L., ac. of F.Y.M.+216 lb./ac. of G.N.C.+18 lb./ac. of A/S+172 lb./ac. of Super+68 lb./ac. of Pot. Sul. (d) Black. (e) Refer soil analysis, Anand. (iii) 3-9.1956. (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Sundia—1049. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. **TREATMENTS** and 3. **DESIGN**:

   - Same as in expno. 55(94) above.

4. **GENERAL**:

   - (i) N.A. (ii) N.A. (iii) Fodder yield. (iv) (a) 1955—1956. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:

   - (i) 5879 lb./ac. (ii) (a) 848.4 lb./ac. (b) 1570 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in lb./ac.
Crop: Jowar (Kharif).

Object: To study the effect of spacings and seed rates on Jowar fodder.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) N.A. (c) Nil. (ii) (a) Coarse sandy loam. (b) Refer soil analysis, Deesa. (iii) 12 and 13.9.1955.
   (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A. (vi) Malvan (local). (vii) Unirrigated. (viii) 1 interculturing and 1 weeding. (ix) 15.65". (x) 9 and 10.12.1955.

2. TREATMENTS:
   Main-plot treatments:
   3 spacings between rows: S1=9", S2=12" and S3=15".
   Sub-plot treatments:
   4 seed rates: R1=20, R2=40, R3=60 and R4=80 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) 3 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 36' x 18' (S1), 36' x 19' (S2) and 36' x 20' (S3). (v) 30' x 15'. (vi) 3' at the ends and 2 rows on either side. (vii) Yes.

4. GENERAL:
   (i) Poor due to drought conditions. (ii) Nil. (iii) Fodder yield. (iv) (a) 1955—N.A. (b) and (c) No. (v) (a) and (b) Nil. (vi) Season was abnormal. (vii) Nil.

5. RESULTS:
   (i) 529 lb./ac. (ii) 287.7 lb./ac. (b) 205.9 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of fodder in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
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<td>542</td>
<td>528</td>
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<tr>
<td>Mean</td>
<td>440</td>
<td>572</td>
<td>550</td>
<td>552</td>
</tr>
</tbody>
</table>

S.E. of mean of difference of two
1. S marginal means = 83.06 lb./ac.
2. R marginal means = 68.62 lb./ac.
3. R means at the same level of S = 118.90 lb./ac.
4. S means at the same level of R = 132.30 lb./ac.
Crop: Jowar (Kharif).

Object: To study the effect of spacings and seed rates on Jowar fodder.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guar. (c) Nil.  (ii) (a) Coarse sandy loam. (b) Refer soil analysis, Deesa. (iii) 7.9.1956.
   (iv) (a) N.A. (b) Drilling. (c) and (d) As per treatments. (e) N.A.  (v) Nil. (vi) Malvan (local). (vii) Unirrigated.  (viii) 1 interculturing. (ix) 35.39°. (x) 9 to 13.12.1956.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 55(19) on page 375.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1955—contd. (b) and (c) No. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3943 lb/acre.  (ii) (a) 1213 lb/acre. (b) 816.6 lb/acre. (iii) None of the effects is significant. (iv) Av. yield of fodder in lb/acre.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
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<th>R3</th>
<th>R4</th>
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<tr>
<td>S3</td>
<td>4420</td>
<td>3775</td>
<td>4082</td>
<td>3985</td>
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<td>Mean</td>
<td>4157</td>
<td>3958</td>
<td>3824</td>
<td>3834</td>
<td>3943</td>
</tr>
</tbody>
</table>

S.E. of difference of two means:
1. S marginal means = 350.1 lb/acre.
2. R marginal means = 272.2 lb/acre.
3. R means at the same level of S = 471.5 lb/acre.
4. S means at the same level of R = 537.8 lb/acre.

Crop: Jowar (Kharif).

Object: To study the effect of spacing and seed rate on Jowar fodder.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Jowar. (c) Nil.  (ii) (a) Yellowish brown. (b) Refer soil analysis, Deesa. (iii) 28 and 29.8. 1958.  (iv) a, Two ploughings and 1 harrowing. (b) Drilling. (c) and (d) As per treatments. (e) N.A.  (v) 20 lb/acre of N as A/S. (vi) Malvan (local). (vii) Unirrigated. (viii) Two interculturings. (ix) 13.9°. (x) 17 to 19.11.1958.

2. TREATMENTS and 3. DESIGN:
   Same as in exp. no. 55(19) on page 375.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Fodder yield. (iv) (a) 1955—contd. (b) and (c) No. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3333 lb/acre. (ii) (a) 981.6 lb/acre. (b) 669.9 lb/acre. (iii) Main effects of S and R are significant. (iv) Av. yield of fodder in lb/acre.
<table>
<thead>
<tr>
<th></th>
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<th>R₃</th>
<th>R₄</th>
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<td>2220</td>
<td>2955</td>
<td>3081</td>
<td>3031</td>
<td>2822</td>
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<tr>
<td>S₃</td>
<td>2954</td>
<td>3462</td>
<td>3902</td>
<td>4088</td>
<td>3601</td>
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<td>2770</td>
<td>3353</td>
<td>3491</td>
<td>3718</td>
<td>3333</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. S marginal means = 283.3 lb./ac.
2. R marginal means = 223.2 lb./ac.
3. R means at the same level of S = 386.7 lb./ac.
4. S means at the same level of R = 454.7 lb./ac.

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

**Site :- Agri. Res. Stn., Halvad.**

Object :- To study the response of Lucerne to different levels of P₂O₅.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 1.1.1954. (iv) (a) One ploughing and 1 harrowing. (b) Broadcasting. (c) 20 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) and (ix) Nil. (x) 15.12.1954 to 29.4.1955.

2. **TREATMENTS**:
   1. Control.
   2. 50 lb./ac. of P₂O₅.
   3. 100 lb./ac. of P₂O₅.
   4. 150 lb./ac. of P₂O₅
   P₂O₅ applied as Super and drilled before sowing.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) 60°×18°. (b) 54°×12°. (v) 3°×3°. (vi) Yes.

4. **GENERAL**:
   (i) N.A. (ii) Nil. (iii) Green fodder yield. (iv) (a) 1954—N.A. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) As treatment 1 gives very low yield (309 lb./ac.), it is excluded from statistical analysis. (vii) Nil.

5. **RESULTS**:
   (i) 1974 lb./ac. (ii) 1188 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of green fodder in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>14856</td>
<td>19414</td>
<td>24953</td>
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<tr>
<td>S.E./mean</td>
<td>=751.3 lb./ac.</td>
<td></td>
<td></td>
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</tbody>
</table>
2. TREATMENTS:

Main-plot treatments:
4 levels of N as A/S+G.N.C. (in 1:1 ratio) applied before sowing: N₀ = 0, N₁ = 50, N₂ = 100 and N₃ = 200 lb./ac.

Sub-plot treatments:
4 levels of P₂O₅ as Super applied before sowing: P₀ = 0, P₁ = 50, P₂ = 100 and P₃ = 150 lb./ac.

3. DESIGN:
(i) Split-pot. (ii) [a] 4 main-plots replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 51'×10'. (b) 47'×8'. (v) 2'×1'. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Attack of aphids and cater pillers. (iii) Green fodder yield. (iv) [a] 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 12923 lb./ac. (ii) (a) 1523 lb./ac. (b) 1483 lb./ac. (iii) Main effects of N and P are highly significant. (iv) Av. yield of green fodder in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
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<tr>
<td>Mean</td>
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<td>12700</td>
<td>13829</td>
<td>14148</td>
<td>12923</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 538.5 lb./ac.
2. S marginal means = 524.2 lb./ac.
3. S means at the same level of N = 1049 lb./ac.
4. N means at the same level of S = 1056 lb./ac.

---

Crop :- Lucerne (Raíi).
Object :- To study the response of Lucerne to different levels of N and P₂O₅.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Sann and wheat. (c) 200 lb./ac. of A/S for sann and 200 lb./ac. of A/S+200 lb./ac. of Super for wheat. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 6.11.1956. (iv) (a) 2 harrowings. (b) Broadcasting. (c) 20 lb./ac. (d) and (e) N.A. (v) Nil. (vi) Local. (vii) Irrigated. (viii) Nil. (ix) 33.75'. (x) Green fodder was cut as and when ready.

2. TREATMENTS:
Same as in expt. no. 55(25) on page 377.

3. DESIGN:
(i) Split-plot. (ii) [a] 4 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 40'×13'. (b) 36'×10'. (v) 2'×1.5'. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Green fodder yield. (iv) (a) 1955—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 22808 lb./ac. (ii) (a) 6348 lb./ac. (b) 3076 lb./ac. (iii) Only main effect of P is highly significant. (iv) Av. yield of green fodder in lb./ac.
Crop :- Lucerne *(Rabi)*.

Site :- Central Expt. Stn., Junagadh.

Object :- To study the response of Lucerne to different levels of P₂O₅.

1. BASAL CONDITIONS:

   (i) (a) N.A.  (b) Jowar for fodder.  (c) Nil.  (ii) (a) Medium black.  (b) Refer soil analysis, Junagadh.  
   (iii) 5.11.1956.  (iv) (a) 3 ploughings and 3 harrowings.  (b) Drilling.  (c) 20 lb./ac.  (d) Between rows : 9"; between plants : irregular.  
   (e) N.A.  (v) Nil.  (vi) Local.  (vii) Irrigated.  (viii) 1 weeding and 3 interculturings.  (ix) Nil.  
   (x) 5.11.1956.

2. TREATMENTS:

   1. Control.
   2. 50 lb./ac. of P₂O₅ as Super.
   3. 100 lb./ac. of P₂O₅ as Super.
   4. 150 lb./ac. of P₂O₅ as Super.
   5. Wheat was grown with 20 lb./ac. of N as A/S. P₂O₅ was drilled at the time of sowing and N was top dressed on 17.12.1956.

3. DESIGN:

   (i) R.B.D.  (ii) (a) 5.  (b) N.A.  (iii) 4.  (iv) (a) 35'×16'.  (b) 30'×12'.  (v) 2'/×2'.  (vi) Yes.

4. GENERAL:

   (i) Below normal.  (ii) Nil.  (iii) Weight at each cutting, green fodder yield. In case of wheat, number of ear heads per plot.  
   (iv) (a) 1956—contd.  (b) No.  (c) N.A.  (v) (a) and (b) N.A.  (vi) Treatment 5 was not included in the analysis as it concerns wheat crop.  (vii) Nil.

5. RESULTS:

   (i) 21778 lb./ac.  (ii) 1059 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of fodder in lb./ac.

   Treatment  | 1   | 2   | 3   | 4   |
   Av. yield  | 10602 | 21145 | 26053 | 29312 |
   S.E./mean  =529.6 lb./ac.

Crop :- Lucerne *(Rabi)*.

Site :- Central Expt. Stn., Junagadh.

Ref :- Gj. 56(43).
Type :- 'M'.

Object :- To study the response of Lucerne to different levels of N and P₂O₅.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) F.Y.M. at 10 C.L./ac., and 30 lb./ac. of N as A/S in 3 doses: 1:2:1.
   (ii) a; Medium black. (b) Refer soil analysis, Junagadh. (iii) 6.11.1957. (iv) (a) 2 ploughings and 1
   harrowing before sowing. (b) Drilling. (c) 20 lb./ac. (d) Between rows 9'. (e) N.A. (v) 20 C.L./ac.
   of F.Y.M. broadcast before sowing. (vi) Local. (vii) Irrigated. (viii) 2 weedings. (ix) Nil. (x) 28,

2. TREATMENTS:
   1. 4 levels of N as A/S: \( N_0 = 0, N_1 = 25, N_2 = 50, N_3 = 75 \) lb./ac.
   2. 5 levels of \( P_2O_5 \) as Super: \( P_0 = 0, P_1 = 25, P_2 = 50, P_3 = 75, P_4 = 100 \) lb./ac.

3. DESIGN:
   (i; Fact. in R.B.D. (ii; (a) 20. (b) N.A. (iii) 3. (iv) (a) 25' x 15'. (b) 20' x 12'. (v) 2' x 2'. (vi) Yes.

4. GENERAL:
   (i) Very good. (ii) Aphids were observed. Nicotine sulphate sprayed on 2.1.1958 and Endrine sprayed on
   2.5.1958. (iii) Green fodder yield. (iv) (a) 1957—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and
   (vii) Nil.

5. RESULTS:
   (i) 52472 lb./ac. (ii) 2957 lb./ac. (iii) Main effect of P alone is highly significant. (iv) Av. yield of green
   fodder in lb./ac.

<table>
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<tr>
<th>P0</th>
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</table>

Mean: 50243 50926 51498 52472

S.E. of P marginal mean: 851.2 lb./ac.
S.E. of N marginal mean: 761.6 lb./ac.
S.E. of body of table: 170.2 lb./ac.

Crop: Lucerne (Rabi).

Site: Central Expt. Stn., Junagadh.

Ref: Gj. 57(51).

Type: 'C'.

Object: To study the effect of different spacings on green fodder yield of Lucerne.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Paddy. (c) Basal dose of F.Y.M. at 10 C.L./ac. and 30 lb./ac. of N as A/S in 3 doses:
   (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) 7.11.1957. (iv) (a) 2 ploughings and 1
   harrowing. (b) Drilling. (c) 20 lb./ac. (d) As per treatments. (e) N.A. (v) 20 lb./ac. of F.Y.M.
   broadcast before sowing and 50 lb./ac. of \( P_2O_5 \) as Super placed deep in the furrows before sowing.

2. TREATMENTS:
   6 spacings between rows: \( S_1 = 6', S_2 = 9', S_3 = 12', S_4 = 15', S_5 = 18' \) and \( S_6 = \) broadcast.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) 25' x 90'. (iii) 4. (iv) (a) 25' x 15'. (b) 20' x 12'. (v) Yes.

4. GENERAL:
   (i) Good. (ii) Aphids were observed. Nicotine sulphate sprayed on 2.1.1958 and Endrine sprayed on
   26.4.1958. (iii) Av. height and yield. (iv) (a) 1957—contd. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and
   (vii) Nil.
5. RESULTS:
(i) 57369 lb./ac.  (ii) 1886 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of green fodder in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
<th>S_5</th>
<th>S_6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>59214</td>
<td>5670</td>
<td>57626</td>
<td>55448</td>
<td>54450</td>
<td>58806</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=942.9 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Lucerne *(Rabi)*.  
Site :- Central Expt. Stn., Junagadh.  
Ref :- Gj. 58(125).  
Type :- 'C'.

Object :- To study the effect of different spacings on green fodder yield of Lucerne.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Black. (b) Refer soil analysis, Junagadh.  (iii) 15.11.1958.  
(iv) (a) 2 ploughings and 1 harrowing. (b) Drilling and broadcasting. (c) 21 lb./ac.  
(d) As per treatments.  
(e)  (v) 5 lb./ac. of F.Y.M.  
(vi) Local (medium).  
(vii) Irrigated.  
(viii) 2 weedings.  
(ix) Nil.  
(x) N.A.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 57(31) on page 380.

4. GENERAL:
(i) Very good.  
(ii) Attack of aphids ; spraying of tobacco decoction and endrine.  
(iii) Yield and height of plant.  
(iv) (a) 1957-1958. (b) No. (c) Nil.  
(v) (a) and (b) N.A.  
(vi) and (vii) Nil.

5. RESULTS:
(i) 38077 lb./ac.  
(ii) 2403 lb./ac.  
(iii) Treatment differences are highly significant.  
(iv) Av. yield of green fodder in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
<th>S_5</th>
<th>S_6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>41881</td>
<td>42199</td>
<td>39340</td>
<td>28994</td>
<td>36028</td>
<td>40021</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=1201 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Lucerne *(Rabi)*.  
Ref :- Gj. 59(82).  
Type :- 'CM'.

Object :- To study the effect of different spacings and doses of fertilizers for Lucerne.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) *Jowar*. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Junagadh.  
(iii) 18.11.1959.  
(iv) (a) 1 ploughing and 1 harrowing. (b) Hand sowing. (c) 20 lb./ac.  
(d) As per treatments.  
(e) N.A.  
(f) Nil.  
(g) N.A.  
(h) Irrigated.  
(i) Nil.  

2. TREATMENTS:
Main-plot treatments :
4 spacings : S_1=6" in rows, S_2=12" in rows, S_3=12" in ridges and furrows and S_4=Broadcast.

Sub-plot treatments :
4 levels of P_2O_5 as Super : P_0=0, P_1=50, P_2=100 and P_3=100 lb./ac.

Sub-sub-plot treatments :
2 levels of N as A/S : N_0=0 and N_1=20 lb./ac.


3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots.replication ; 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A.  
(iii) 2. (iv) (a) 24'×18'. (b) 20'×14'. (v) 2'×2'. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Green fodder yield. (iv) (a) 1959—1961. (b) and (c) N.A. (v) (a) and (b) N.l. (vi) and (vii) Nil.

5. RESULTS:
(i) 39735 lb./ac. (ii) (a) 11066 lb./ac. (b) 4995 lb./ac. (c) 10573 lb./ac. (iii) Only main effect of P is highly significant. (iv) Av. yield of green fodder in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>M1</th>
<th>M2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F0</td>
<td>36243</td>
<td>23968</td>
<td>29344</td>
<td>37677</td>
<td>34451</td>
<td>29166</td>
<td>31808</td>
</tr>
<tr>
<td>F1</td>
<td>37901</td>
<td>35840</td>
<td>36993</td>
<td>43322</td>
<td>37311</td>
<td>39178</td>
<td>38494</td>
</tr>
<tr>
<td>F2</td>
<td>46189</td>
<td>42381</td>
<td>37834</td>
<td>50669</td>
<td>43232</td>
<td>45293</td>
<td>44374</td>
</tr>
<tr>
<td>F3</td>
<td>47488</td>
<td>40746</td>
<td>40118</td>
<td>49146</td>
<td>44733</td>
<td>44262</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>42112</td>
<td>35734</td>
<td>36047</td>
<td>45203</td>
<td>40057</td>
<td>39413</td>
<td>39735</td>
</tr>
</tbody>
</table>

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

CROP :- As per rotations (Kharif).
Site :- Agri. Res. Sta., Amreli.
Ref :- Gj. 56(84).
Type :- ‘R’.

Object :- To find out suitable rotation of crops for this tract.

1. BASAL CONDITIONS:
(i) (a) As per treatments. (b) Cotton. (c) 5 C.L.ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 10.7.1956. (iv) (a) N.A. (b) Drilling. (c) Jowar—8 lb./ac., bajra—5 lb./ac., groundnut—20 lb./ac. and cotton—20 lb./ac. (d) 18" for groundnut and jowar, 36" for cotton and bajra. (e) —. (f) 5 C.L.ac. of F.Y.M. (g) Jowar and bajra mass selected, groundnut A.H.—32 and cotton—Pratap. (h) Unirrigated. (i) 2 interculturings and 2 weedings. (j) 26.98'. (k) Jowar 14.11.1956, Bajra 19.11.1956, groundnut 19.10.1956 and cotton 25.11.1956 to 15.1.1957.

2. TREATMENTS:
1a Jowar—Jowar.
1b Jowar—Bajra.
1c Jowar—Groundnut.
1d Jowar—Cotton.
2a Bajra—Jowar.
2b Bajra—Bajra.
2c Bajra—Groundnut.
2d Bajra—Groundnut.
3a Groundnut—Jowar.
3b Groundnut—Bajra.
3c Groundnut—Groundnut.
3d Groundnut—Cotton.
4a Cotton—Jowar.
4b Cotton—Bajra.
4c Cotton—Groundnut.
4d Cotton—Cotton.

3. DESIGN:
(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 2. (iv) (a) 36"×36'. (b) 30"×30'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Jowar affected by aphids and jassids and groundnut affected by tikka. (iii) Kapas, pod, grain and fodder yield. (iv) (a) 1956—1961. (b) and (c) As per rotations. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

This being the first year of the expt. the analysis is not possible.

---

**Crop**: As per rotations (*Kharif*).

**Site**: Agri. Res. Sta., Amreli.

**Object**: To find out suitable rotation of crops for this tract.

1. **BASAL CONDITIONS**:


2. **TREATMENTS and DESIGN**:

Same as in expt. no. 56(84) on page 382.

3. **GENERAL**:

(i) Due to absence of rains in Sept. and Oct., the growth of crops suffered to some extent. (ii) Attack of rust and smut in *bajra*; smut in *jowar*; *tikka* in groundnut. (iii) Grain, fodder, seed cotton, and pod yield. (iv) (a) 1956—1961. (b) and (c) As per rotations. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:

I. **Jowar**

(i) 988.0 lb/ac. (ii) 175.8 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>827.2</td>
<td>902.9</td>
<td>1318.9</td>
<td>902.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=124.3 lb/ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II. **Bajra**

(i) 565.6 lb/ac. (ii) 56.02 lb/ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>512.8</td>
<td>544.2</td>
<td>707.6</td>
<td>497.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=39.62 lb/ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

III. **Groundnut**

(i) 484.4 lb/ac. (ii) 216.1 lb/ac. (iii) Treatment differences are significant. (iv) Av. yield of pod in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>447.7</td>
<td>539.9</td>
<td>492.9</td>
<td>456.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=152.8 lb/ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV. **Cotton**

(i) 468.1 lb/ac. (ii) 229.6 lb/ac. (iii) Treatment differences are not significant. (iv) Av. yield of *Kapas* in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>491.5</td>
<td>556.6</td>
<td>450.6</td>
<td>373.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=162.3 lb/ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop :- As per rotations (Kharif).

Object :- To find out the suitable rotation of crops for this tract.

1. BASAL CONDITIONS:
(i) (a) and (b) As per treatments. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 1st week of June 1958. (iv) (a) N.A. (b) Drilling. (c) Jowar 8 lb./ac., bajra 5 lb./ac. and groundnut at 50 lb./ac. (d) 18" for jowar and groundnut; 30" for cotton and bajra. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Jowar E.M.S; bajra E.M.S; groundnut A.H.—32 and cotton (Pratap). (vii) Unirrigated. (viii) N.A. (ix) 25.30'. (x) N.A.

2. TREATMENTS and 3. DESIGN:
Same as in exp. no. 56,84) on page 382.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain and fodder, sized cotton and pod yield. (iv) (a) 1956—1961. (b) and (c) As per treatments. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

I. Jowar
(i) 462.2 lb./ac. (ii) 70.19 lb./ac. (ii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>306.1</td>
<td>584.4</td>
<td>465.8</td>
<td>492.5</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>49.63 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II. Bajra
(i) 679.1 lb./ac. (ii) 80.55 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>399.3</td>
<td>803.4</td>
<td>808.3</td>
<td>705.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>56.96 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

III. Groundnut
(i) 838 lb./ac. (ii) 56.72 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>543</td>
<td>1284</td>
<td>800</td>
<td>722</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>40.11 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV. Cotton
(i) 650.4 lb./ac. (ii) 67.47 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>358.9</td>
<td>977.7</td>
<td>659.0</td>
<td>606.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>47.71 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- As per rotations (Kharif).

Object :- To find out the suitable rotation of crops for this tract.

1. BASAL CONDITIONS:
(i) (a) and (b) As per treatments. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 1st week of July 1959. (iv) (a) N.A. (b) Drilling. (c) Jowar 8 lb./ac., bajra 5 lb./ac., groundnut 50 lb./ac. and cotton at 20 lb./ac. (d) Jowar 18', bajra 36', groundnut 18" and cotton 36'. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Jowar E.M.S. Bajra E.M.S. Groundnut A.H.—32 and Cotton C.I.—73. (vii) Unirrigated. (viii) N.A. (ix) 45.36'. (x) N.A.
2. TREATMENTS and 3. DESIGN:
Sams as in expt. no. 56(84) on page 382.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and fodder, seed cotton and pod yield. (iv) (a) 1956—1961. (b) and (c) As per rotations. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

I. Jowar
(i) 185.4 lb./ac. (ii) 37.49 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>151.2</td>
<td>148.8</td>
<td>246.8</td>
<td>194.8</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=26.51 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II. Bajra
(i) 54.15 lb./ac. (ii) 11.48 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>59.29</td>
<td>54.45</td>
<td>65.34</td>
<td>37.51</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=8.11 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

III. Groundnut
(i) 92.0 lb./ac. (ii) 35.56 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>113.7</td>
<td>82.3</td>
<td>61.7</td>
<td>110.1</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=25.15 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV. Cotton
(i) 88.3 lb./ac. (ii) 31.30 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>81.1</td>
<td>90.8</td>
<td>136.7</td>
<td>44.8</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=22.13 lb./ac.</td>
<td></td>
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</tr>
</tbody>
</table>

Site :- Cotton Breeding Stn., Broach.
Object :- To assess the use of Lang, Jowar and a mixture of these two as proper rotations with Cotton crop.
Ref :- Gj. 54(27).
Type :- 'R'.

1. BASAL CONDITIONS:

2. TREATMENTS:

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) 108' X 72'. (iii) 6. (iv) (a) 36' X 36'. (b) 24' X 28'. (v) 2 guard rows. (vi) Yes.
4. GENERAL.
   (i) Satisfactory. (ii) Nil. (iii) Kapas, grain and seed yield. (iv) (a) 1954—1961. (b) Yes. (c) —. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

   I. Cotton
   (i) 681.2 lb./ac. (ii) 164.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.
   Treatment 1 2 3
   Av. yield 700.1 656.8 686.8
   S.E./mean = 67.3 lb./ac.

   II. Jowar
   (i) 659.2 lb./ac. (ii) 121.6 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.
   Treatment 2 3
   Av. yield 785.6 532.7
   S.E./mean = 49.6 lb./ac.

   III. Lang
   (i) 201.7 lb./ac. (ii) 45.90 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of lang seed in lb./ac.
   Treatment 1 3
   Av. yield 319.2 84.1
   S.E./mean = 18.74 lb./ac.

Site :- Cotton Breeding Stn., Broach.
Ref :- Gj. 55(14).
Type :- 'R'.

Object :- To assess the use of Lang, Jowar and a mixture of these two as proper rotations with Cotton crop.

1. BASAL CONDITIONS
   (i) (a) and (b) As per rotations. (c) Nil. (ii) (a) Deep black and clayey soil. (b) N.A. (iii) Jowar 28.10.1955, lang 28.10.1955 and cotton 5.7.1955. (iv) (a) Four harrowings. (b) to (c) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Broach—Digvijay cotton. (vii) Unirrigated. (viii) 3 interculturings and 1 weeding. (ix) 33°.

2. TREATMENTS to 3. DESIGN:
   Same as in expt. no. 54(27) on page 385.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Kapas, grain and seed yield. (iv) (a) 1954—1961. (b) Yes. (c) —. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

   I. Cotton
   (i) 727.3 lb./ac. (ii) 94.82 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.
   Treatment 1 2 3
   Av. yield 569.6 894.4 717.9
   S.E./mean = 38.71 lb./ac.

   II. Jowar
   (i) 294.5 lb./ac. (ii) 112.2 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac
Crop :- Cotton-Jowar-Lang.  
Site :- Cotton Breeding Stn., Broach.  

Ref :- Gj. 56(14).  
Type :- 'R'.

Object :-To assess the use of Lang, Jowar and a mixture of these two as proper rotations with Cotton crop.

1. BASAL CONDITIONS:

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. '54(27) on page 385.

4. GENERAL:
   (i) First sown crop failed due to excessive rains. Gap fillings gave a good stand. (ii) Nil. (iii) Kapas, grain and seed yield. (iv) (a) 1954—1961. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Low yield due to late sowing.

5. RESULTS:
   I. Cotton
      (i) 334.2 lb./ac. (ii) 52.63 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of kapas in lb./ac.
      Treatment 1 2 3
      Av. yield 312.3 385.6 304.8
      S.E./mean = 21.49 lb./ac.

   II. Jowar
      (i) 548.1 lb./ac. (ii) 84.67 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.
      Treatment 2 3
      Av. yield 772.8 323.4
      S.E./mean = 34.57 lb./ac.

   III. Lang
      (i) 409.9 lb./ac. (ii) 114.1 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of lang seed in lb./ac.
      Treatment 1 3
      Av. yield 595.7 224.0
      S.E./mean = 46.6 lb./ac.
Crop :- Cotton-Jowar-Lang.
Ref :- Gj. 57(12).
Site :- Cotton Breeding Stn., Broach.
Type :- 'R'.

Object :- To assess the use of Lang, Jowar and a mixture of these two as proper rotations with Cotton crop.

1. BASAL CONDITIONS :
   1. As per treatments. 
   2. As per rotations. 
   3. 5 C.L./ac. of F.Y.M. 
   4. (a) Deep black and clayey. 
   5. N.A. 
   7. (a) 1 to 2 harrowings. 
   8. N.A. 
   9. 2 C.L./ac. of F.Y.M. 
   10. 'Cotton—Broach Digvijay. 
   11. Unirrigated. 
   12. 4 interculturings and 1 gap filling. 
   13. 28.9.44. 

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 54,27, on page 385.

4. GENERAL:
   1. Normal. 
   2. Attack of pink boll-worm in 1st stage of crop. 
   3. Kapas, grain and seed yield. 
   5. Yes. 
   7. N.A. 
   8. and (vii) Nil.

5. RESULTS:

   I. Cotton
   1. 360.6 lb./ac. 
   2. 57.62 lb. ac. 
   3. Treatment 'differences are not significant. 
   4. Av. yield of kapas in lb./ac. 
   Treatment | 1 | 2 | 3 | S.E./mean
   5. 311.2 | 414.2 | 356.4 | =23.52 lb./ac.

   II. Jowar
   1. 393.4 lb./ac. 
   2. 121.6 lb. ac. 
   3. Treatment difference is significant. 
   4. Av. yield of grain in lb./ac. 
   Treatment | 2 | 3 | S.E./mean
   5. 526.9 | 259.8 | =49.6 lb./ac.

   III. Lang
   1. 38.86 lb./ac. 
   2. 10.0 lb./ac. 
   3. Treatment difference is highly significant. 
   4. Av. yield of lang seed in lb./ac. 
   Treatment | 1 | 3 | S.E./mean
   5. 63.57 | 14.16 | =4.08 lb./ac.
5. RESULTS:

I. Cotton

(i) 687.2 lb./ac. (ii) 55.63 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>631.8</td>
<td>22.71 lb./ac.</td>
</tr>
<tr>
<td>2</td>
<td>818.1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>611.8</td>
<td></td>
</tr>
</tbody>
</table>

II. Jowar

(i) 420.3 lb./ac. (ii) 69.23 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>489.1</td>
<td>28.26 lb./ac.</td>
</tr>
<tr>
<td>3</td>
<td>351.4</td>
<td></td>
</tr>
</tbody>
</table>

III. Lang

(i) 92.7 lb./ac. (ii) 35.92 lb./ac. (iii) Treatment differences is highly significant. (iv) Av. yield of lang seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>134.6</td>
<td>14.66 lb./ac.</td>
</tr>
<tr>
<td>3</td>
<td>50.8</td>
<td></td>
</tr>
</tbody>
</table>


Object: To assess the use of Lang, Jowar and a mixture of these two as proper rotations with Cotton crop.

1. BASAL CONDITIONS:


2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 54(27) on page 385.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Seed cotton, grain and fodder yield. (iv) (a) 1954—1961. (b) and (c) Yes. (v) (a) Bhuwa. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

I. Cotton

(i) 336.1 lb./ac. (ii) 91.66 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>325.1</td>
<td>37.42 lb./ac.</td>
</tr>
<tr>
<td>2</td>
<td>341.4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>341.7</td>
<td></td>
</tr>
</tbody>
</table>

II. Jowar

(i) 715.9 lb./ac. (ii) 178.2 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>986.9</td>
<td>72.7 lb./ac.</td>
</tr>
<tr>
<td>3</td>
<td>445.0</td>
<td></td>
</tr>
</tbody>
</table>
III. Lang

(i) 301.9 lb./ac. (ii) 65.84 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of lang seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>490.8</td>
<td>113.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=26.88 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

Object :-To fix up the best rotation for Cotton.  
Ref :- Gj. 54(99).  
Type :- 'R'.

1. BASAL CONDITIONS :
   (i) As per treatments. (b) Wheat. (c) Nil. (i) (a) Black cotton soil. (b) N.A. (iii) Cotton : 19.8.1954  

2. TREATMENTS :

3. DESIGN :
   (i) R.B.D. (ii) a) 6. (b) 216' x 216'. (iii) 6. (iv) (a) 30' x 36'. (b) 28' x 24'. (v) 4' x 6'. (vi) Yes.

4. GENERAL :
   (i) Below normal. (ii) Nil. (iii) Seed cotton, grain and seed yield. (iv) (a) 1954—1958. (b) and (c) 1st year of crop. (v) (a) and (b), Breach. (vi) Due to heavy rains after sowing the growth of the crops was not quite normal. (vii) Nil.

5. RESULTS :

I. Cotton
   (i) 532.3 lb./ac. (ii) 83.00 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of seed cotton in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>415.0</td>
<td>613.4</td>
<td>538.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=33.88 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

II. Jowar
   (i) 654.9 lb./ac. (ii) 276.6 lb./ac. (iii) Treatment difference is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>889.5</td>
<td>420.3</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=112.9 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

III. Lang
   (i) 344.7 lb./ac. (ii) 150.1 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of lang seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>439.2</td>
<td>250.2</td>
</tr>
<tr>
<td>S.E. mean</td>
<td>=61.3 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>
Crop : Jowar—Lang—Cotton.  
Object :—To fix up the best rotation for Cotton.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) Nil.  
   (ii) (a) Black cotton soil. (b) N.A.  
   (iii) Cotton : 3.7.1955,  
   (c) Jowar and cotton 8 lb./ac. Lang 40 lb./ac.  
   (d) Cotton 6', Jowar 3', Lang 1.5'.  
   (e) 3-4 seeds/dibble.  
   (f) Nil.  
   (g) Jowar No.8; Lang-Indore T-2-12; Cotton—Vijaya.  
   (h) Unirrigated.  
   (i) Unirrigated.  
   (j) Jowar: 1 thinning, 2 interculturings. Lang : 1 thinning, 1 interculturating and 1 weeding.  
   (k) 34.87".  

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 54(99) on page 390.

4. GENERAL:
   (i) Normal.  
   (ii) Nil.  
   (iii) Seed cotton, grain and seed yield for jowar and lang.  
   (b) Yes.  
   (c) Nil.  
   (v) (a) and (b) Nil.  
   (vi) and (vii) Nil.

5. RESULTS:

I. Cotton
   (i) 954 lb./ac.  
   (ii) 215.4 lb./ac.  
   (iii) Treatment differences are not significant.  
   (iv) Av. yield of kapas in lb./ac.
   Treatment 1 2 3  
   Av. yield 924 856 1083
   S.E./mean =87.9 lb./ac.

II. Jowar
   (i) 185.2 lb./ac.  
   (ii) 101.7 lb./ac.  
   (iii) Treatment difference is significant.  
   (iv) Av. yield of grain in lb./ac.
   Treatment 1 3  
   Av. yield 286.1 84.2
   S.E./mean =41.5 lb./ac.

III. Lang
   (i) 768.4 lb./ac.  
   (ii) 95.05 lb./ac.  
   (iii) Treatment difference is highly significant.  
   (iv) Av. yield of lang seed in lb./ac.
   Treatment 2 3  
   Av. yield 942.9 594.0
   S.E./mean =38.80 lb./ac.
2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 54(99) on page 390.

4. GENERAL:
   (i) Growth of the crops was checked due to heavy rains. (ii) Boll-worm attack on cotton. Light attack of stem-borer on Jowar. (iii) Grain, kapas and seed yield. (iv) (a) 1954—1958. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii), Nil.

5. RESULTS:

   I. Cotton
   (i) 608.4 lb./ac. (ii) 66.73 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

   Treatment 1 2 3
   Av. yield 440.2 859.9 525.2
   S.E./mean 27.24 lb./ac.

   II. Jowar
   (i) 476.6 lb./ac. (ii) 97.87 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac.

   Treatment 1 3
   Av. yield 536.8 416.4
   S.E./mean 39.96 lb./ac.

   III. Lang
   (i) 436.8 lb./ac. (ii) 28.99 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of lang seed in lb./ac.

   Treatment 2 3
   Av. yield 538.1 335.6
   S.E./mean 11.84 lb./ac.

---

Ref :- Gj. 57(10).
Type :- ‘R’.
Object :- To fix up the best rotation for Cotton.

1. BASAL CONDITIONS:

2. TREATMENTS and 3 DESIGN:
   Same as in expt. no. 54(99) on page 390.

4. GENERAL:
   (i) Below normal. (ii) Light attack of boll worm. Heavy attack cf pod borer. (iii) Grain, kapas and seed yield. (iv) (a) 1954—1958. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii), Nil.

5. RESULTS:

   I. Cotton
   (i) 229.1 lb./ac. (ii) 43.96 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of kapas in lb./ac.

   Treatment 1 2 3
   Av. yield 296.2 53.2 337.9
   S.E./mean 17.95 lb./ac.
II. Jowar

(i) 131.3 lb./ac.  (ii) 52.66 lb./fac.  (iii) Treatment difference is significant.  (iv) Av. yield of grain in lb./fac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>170.7</td>
<td>-21.50 lb./ac.</td>
</tr>
<tr>
<td>3</td>
<td>91.9</td>
<td></td>
</tr>
</tbody>
</table>

(iii) Treatment difference is significant. (iv) Av. yield of grain in lb./fac.

III. Lang

(i) 178.5 lb./ac.  (ii) 50.62 lb./fac.  (iii) Treatment difference is highly significant.  (iv) Av. yield of lang seed in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>345.2</td>
<td>-20.67 lb./ac.</td>
</tr>
<tr>
<td>2</td>
<td>11.8</td>
<td></td>
</tr>
</tbody>
</table>


Object :- To fix up the best rotation for Cotton.

1. BASAL CONDITIONS:

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 54(99) on page 390.

4. GENERAL:
   (i) Cotton : Germination was satisfactory but due to heavy rains, some of the plants died which resulted in low yield.  (ii) Light attack of boll worm. (iii) Seed cotton, jowar and lang grains.  (iv) (a) 1954—1958.  (b) No.  (c) Nil.  (v) (a) and (b) Broach. (vi) Nil.  (vii) Results for jowar and lang—N.A.

5. RELULTS:

   Cotton

   (i) 444 lb./ac.  (ii) 145.3 lb./fac.  (iii) Treatment differences are significant.  (iv) Av. yield of kapes in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>306</td>
<td>59.3 lb./ac.</td>
</tr>
<tr>
<td>2</td>
<td>563</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>463</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Groundnut—Cotton—Bajra—Jowar.
Site :- Central Expt. Stn., Junagadh.

Object :- To find out the best rotation of crops for this tract.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) 5 C.L./ac. of F.Y.M.  (ii) (a) Medium black. (b) Refer soil analysis, Junagadh. (iii) Groundnut—29.6.1954, Cotton—2.7.1954 and Jowar and Bajra—19.6.1954.  (iv) (a) 2 to 3 harrowings. (b) Drilled. (c) 10 lb./ac. for Jowar and Bajra.  (d) Between rows 3' for all crops. Between plants : Groundnut 2', Cotton 6', Bajra and Jowar irregular.  (e) Groundnut—1, Cotton—2 to 3  C.L./ac. of F.Y.M. applied in furrows 15 days before sowing.  (vi) Groundnut—Kopergaon, Cotton—Kalyan, Bajra—Local, Jowar—Local.  (vii) Unirrigated.  (viii) 3 interculturations and 3 weedings. (ix) 38.33°.  (x) Groundnut—2.11.1954, Cotton—10.2.1955, Bajra and Jowar—25.10.1954.
2. TREATMENTS:

2. Groundnut—Bajra.

3. DESIGN:

1. R.B.D. (ii) 10. [b] N.A. (iii) 4. (iv) (a) 50'×24'. (b) 44'×12'. (v) 3'×6'. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) 5% attack of tikka. (iii) Grain and fodder yield. (iv) (a) 1952—contd. (b) As per treatments. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundnut</td>
<td>2</td>
<td>1223</td>
<td>54.1 lb./ac.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>1376</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>1249</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>1234</td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>1</td>
<td>296.0</td>
<td>35.8 lb./ac.</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>468.6</td>
<td></td>
</tr>
<tr>
<td>Bajra</td>
<td>3</td>
<td>424.8</td>
<td>25.20 lb./ac.</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>508.4</td>
<td></td>
</tr>
<tr>
<td>Jowar</td>
<td>4</td>
<td>128.5</td>
<td>23.09 lb./ac.</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>234.6</td>
<td></td>
</tr>
</tbody>
</table>

Site: Central Expt. Stn., Junagadh.  
Ref: Gj. 55(41).  
Type: ‘R’.  

Object: To find out the best rotation of crops for this tract.

1. BASAL CONDITIONS:


2. TREATMENTS and 3. DESIGN:

Same as in expt. no. 54,56) on page 393.
GENERAL:
(i) Stunted and scanty growth due to late rains. (ii) Attack of aphids on groundnut. Spraying of Nicotin Sulphate. (iii) Grain and fodder yield. (iv) (a) 1952—contd. (b) As per treatments. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

I. Groundnut
(i) 635.5 lb./ac. (ii) 86.39 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>220.0</td>
<td>43.19 lb./ac.</td>
</tr>
<tr>
<td>4</td>
<td>731.1</td>
<td>729.7</td>
</tr>
<tr>
<td>7</td>
<td>861.3</td>
<td>861.3</td>
</tr>
</tbody>
</table>

II. Cotton
(i) 777.3 lb./ac. (ii) 146.0 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>821.1</td>
<td>73.0 lb./ac.</td>
</tr>
<tr>
<td>6</td>
<td>733.6</td>
<td>733.6</td>
</tr>
</tbody>
</table>

III. Bajra
(i) 370.8 lb./ac. (ii) 11.67 lb./ac. (iii) Treatment difference is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>442.9</td>
<td>5.84 lb./ac.</td>
</tr>
<tr>
<td>5</td>
<td>298.7</td>
<td>298.7</td>
</tr>
</tbody>
</table>

IV. Jowar
The crop failed


1. BASAL CONDITIONS:
(i) and (ii) Same as in exp. no. 54(56) on page 393. (iii) N.A. (iv) and (v) Same as in exp. no. 54(56) on page 393. (vi) Groundnut—Kopergaon; Cotton—Kalyan; Bajra—local; Jowar—selection 213. (vii) Unirrigated. (viii) 3 interculturings and 3 weedings. (ix) 59.56. (x) N.A.

2. TREATMENTS to 3. DESIGN:
Same as in exp. no. 54(56) on page 393.

4. GENERAL:
(i) Jowar below normal. Other crops normal. (ii) Nil. (iii) Grain and fodder yield. (vi) (a) 1952—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

I. Groundnut
(i) 1328 lb./ac. (ii) 182.8 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1400</td>
<td>91.4 lb./ac.</td>
</tr>
<tr>
<td>4</td>
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<td>6</td>
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</tbody>
</table>

II. Cotton
(i) 412.7 lb./ac. (ii) 57.55 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of kapas in lb./ac.
Crop :- Groundnut—Cotton—Bajra—Jowar.  
Site :- Central Expt. Stn., Junagadh.  
Object :-To find out the best rotation of crops for this tract.

1. BASAL CONDITIONS:
(i) and (ii) Same as in expt. no. 54(56), on page 393. (iii) 1.7.1957. (iv) to (vii) Same as in expt. no. 56(50) on page 395. (viii) 2 interculturings and 2 to 3 weedings. (ix) 30.2r. (x) Cotton: 18.1.1958, 20.2.1958, 22.3.1958; Jowar: 4.11.1957; Bajra: 4.10.1957; Groundnut: 18.10.1957.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 54(56) on page 393.

4. GENERAL:
(i) No. mat. (ii) Tikka and aphids for groundnut. (iii) Grain and fodder yield. (iv) (a) 1952—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Scanty rains affected the growth of the crop. (vii) Nil.

5. RESULTS:
I. Groundnut
(ii) 857.0 lb./ac. (ii) 86.22 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of pod in lb./ac.

II. Cotten
(i) 410.8 lb./ac. (ii) 27.77 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of kapas in lb./ac.

III. Bajra
(i) 409.4 lb./ac. (ii) 62.29 lb./ac. (iii) Treatment difference is not significant. (iv) Av. yield of grain in lb./ac.
Crop :- Groundnut, Wheat and Sann.  
Site :- Central Expt. Stn., Junagadh.

Ref :- Gj. 57(60).  
Type :- 'R'.

Object :- To find out the best rotational system for Groundnut and Wheat.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments.  (c) 5 C.L./ac. of F.Y.M.  (i) (a) Medium black.  (b) Refer soil analysis, Junagadh.  (iii) Groundnut 3.7.1957, Sann 11.7.1957 and Wheat 31.10.1957.  (iv) (a) N.A.  (b) Drilling.  (c) N.A.  (d) Groundnut 2’, Sann 1’ and Wheat 1’ between rows ; within rows irregular.  (e) N.A.  (v) 5 C.L./ac. of F.Y.M. applied 15 days before sowing.  (vi) Groundnut : AK 12-24 ; Sann : Local ; Wheat : N.P.-710.  (vii) Irrigated.  (viii) Two interculturings and 2 to 3 weedings.  (ix) 30.21`.  (x) Groundnut 18.10.1957, Sann 1.9.1957 and Wheat 26.2.1958.

2. TREATMENTS:
   1. Groundnut-Groundnut.  (Fallow in Rabi)
   2. Groundnut-Wheat.
   4. Fallow-Wheat.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) 40’ x 12’.  (b) 36’ x 8’.  (v) 2’ x 2’.  (vi) Yes.

4. GENERAL:
   (i) The germination was good, the growth was normal.  (ii) Tikka and aphids in groundnut, pest in wheat.  (iii) Pod and fodder for groundnut.  Grain and straw for wheat.  (iv) (a) 1957—contd.  (b) Yes.  (c) N.A.  (v) (a) and (b) N.A.  (vi) There were no rains for the first fortnight of August which has considerably affected the yield of the groundnut and robbing of Sann.  Wheat was normal.  (vii) Nil.

5. RESULTS:
   I. Groundnut
   (i) 624.4 lb./ac.  (ii) 121.0 lb./ac.  (iii) Treatment difference is not significant.  (iv) Av. yield of pod in lb./ac.

   Treatment  1  2
   Av. yield  633.8  614.9
   S.E./mean  =49.4 lb./ac.

   II. Wheat
   (i) 2086 lb./ac.  (ii) 162.9 lb./ac.  (iii) Treatment differences are significant.  (v) Av. yield of grain in lb./ac.

   Treatment  2  3  4
   Av. yield  1929  2175  2153
   S.E./mean  =66.5 lb./ac.

Crop :- Wheat, Sann and Groundnut.  
Site :- Central Expt. Stn., Junagadh.

Ref :- Gj. 58(43).  
Type :- 'R'.

Object :- To find out the best rotational system for Groundnut and Wheat.
1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) —. (ii) (a) Black loamy soil. (b) Refer soil analysis, Junagadh.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 57(60) on page 397.

4. GENERAL:
   (i) Nil. (ii) Groundnut crop was affected by tikka to some extent. (iii) Groundnut pod, wheat grain and straw yield. (iv) (a) 1957—contd. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

I. Groundnut
   (i) 1167 lb./ac. (ii) 91.96 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of pod in lb./ac.
   Treatment 1 2
   Av. yield 1282 1052
   S.E./mean =37.54 lb./ac.

II. Wheat
   (i) 2329 lb./ac. (ii) 182.7 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.
   Treatment 2 3 4
   Av. yield 2124 2555 2309
   S.E./mean =74.6 lb./ac.
Crop :- Cotton, Jowar and Tur.


Object :- To study the best rotation for Cotton, Jowar and Tur with and without manures.

1. BASAL CONDITIONS :

2. TREATMENTS :
   12 rotations as follows
   (1) Cm—every year
   (2) Cm—C
   (3) Jm—every year
   (4) Jm—J
   (5) Cm—J
   (6) C—T
   (7) Cm—T
   (8) J—T
   (9) Jm—T
   (10) Cm—J—T
   (11) Cm—T—J
   (12) J+T—C


3. DESIGN :
   (i) R.B.D. (ii) (a) 46. (b) N.A. (iii) 6. (iv) (a) 31' X 30'. (b) 22' X 18' for treatments 1 to 11. For treatment 12 : 50' X 18'. (v) 6' on either side, 6' on one end and 3' on the other. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) 40% attack of stem-borer in Jowar. Heavy attack of pod-borer in Tur. (iii) Seed cotton, Jowar grain and fodder. Tur pods in lbs. (iv) (a) 1948—contd. (modified in 1951 and 1954). (b) and (c) As per rotations. (v) Jalgaon. (vi) and (viii) Nil.

5. RESULTS :
   I. Cotton
   (i) 803 lb./ac. (ii) 104.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kopus
   Rotation no.: (1) (2) (2) (2) (5) (6) (6) (7) (7) (10) (10) (11) (12)
   Crop : Cm Cm C C C C C C C C C C
   Previous crop : Cm C C C C C C C C C C C
   Av. yield : 1016 687 980 1291 569 519 592 559 704 776 1330 617
   S.E./mean = 42.7 lb./ac.

   II. Jowar
   (i) 842 lb./ac. (ii) 224.6 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain
   Rotation no.: (3) (4) (4) (4) (5) (8) (8) (9) (9) (10) (11) (11) (12)
   Crop : Jm Jm J J J J Jm Jm J J J J
   Previous crop : Jm Jm Cm T Tm T Tm Cm T Tm C
   Av. yield : 838 1060 677 1016 666 1045 675 611 1069 655 629 1167
   S.E./mean = 91.7 lb./ac.

   III. Tur
   (i) 239 lb./ac. (ii) 66.50 lb./ac. (iii) Main effect of rotations is highly significant. Others are not significant. (iv) Av. yield of pod in lb./ac.
**Crop:** Cotton—Jowar—Tur (Kharif).

**Site:** Agri. Res. Stn., Surat.

**Ref:** Gj. 55(50).

**Type:** 'R'.

**Object:** To study the best rotations for Cotton, Jowar and Tur with and without manures.

### 1. BASAL CONDITIONS:

- (i) a to c) As per treatments. (ii) a: Black cotton soil. (b) Refer soil analysis, Surat. (iii) Cotton-23.6. 1955, jowar and tur 23.7.1955. (iv) a: N.A. b: Cotton—dibbling, jowar and tur—drilling. (e) 8 to 10 lb. ac. jowar, 10 to 15 lb. ac. tur, and 2 lb. ac. cotton. (d) Cotton-6' x 2'; Jowar and Tur-3' x 1'. (e) N.A. (v) Nil. (vi) Cotton—Suyog, jowar—B.P. 53, Tur—local. (vii) Unirrigated. (viii) 1 thinning for all plots.

### 2. TREATMENTS:

Same as in exp. no. 54.68: on page 399.


### 3. DESIGN:

- (i) R.B.D. (ii) a: 46. b) N.A. (iii) 6. (iv) a) 3' x 30' for treatments 1 to 11. For treatment 12—50' x 18'. (b) 22' x 18'. (v) 6' at either side, 6' at one end and 3' at the other. (vi) Yes.

### 4. GENERAL:

- (i) Normal. (ii) Attack of grey mildew on cotton. (iii) Seed cotton, jowar and tur grain yield. (iv) (a) 1948—contd (modified in 1951 and 1954). (b) As per rotations. (c) Nil. (v) (a) and (b) Jalgaon. (vi) and (vii) Nil.

### 5. RESULTS:

#### I. Cotton

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<tr>
<th>Rotation no.</th>
<th>(6)</th>
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<th>(10)</th>
<th>(11)</th>
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<td>J</td>
<td>Jm</td>
<td>J</td>
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<td>C</td>
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<tr>
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<td>1143</td>
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S.E. mean = 31.73 lb./ac.

#### II. Jowar

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<td>Cm</td>
<td>T</td>
<td>Cm</td>
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<tr>
<td>Av. yield</td>
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<td>1562</td>
<td>1598</td>
<td>1365</td>
<td>820</td>
<td>797</td>
<td>930</td>
<td>945</td>
<td>1621</td>
<td>838</td>
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</table>

S.E. mean = 51.0 lb./ac.

#### III. Tur

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<td>Jm</td>
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<td>Tm</td>
<td>C</td>
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</tr>
<tr>
<td>Av. yield</td>
<td>1741</td>
<td>1562</td>
<td>1598</td>
<td>1365</td>
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<td>797</td>
<td>930</td>
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<td>838</td>
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S.E. mean = 51.0 lb./ac.
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<tr>
<td>Tm</td>
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<td>542</td>
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<td>379</td>
<td>444</td>
<td>417</td>
<td>441</td>
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<td>403</td>
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<tr>
<td>Mean</td>
<td>326</td>
<td>398</td>
<td>437</td>
<td>479</td>
<td>413</td>
<td>449</td>
<td>417</td>
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</table>

S.E. of marginal mean of rotations = 32.8 lb./ac.
S.E. of marginal mean of manures = 18.9 lb./ac.
S.E. of body of table = 46.4 lb./ac.

**Crop :- Cotton, Jowar and Tur (Kharif).**

**Site :- Agri. Res. Stn., Surat.**

Ref :- Gj. 56(59).

**Type :- ‘R’**

Object :- To study the best rotation for Cotton, Jowar and Tur with and without manures.

1. **BASAL CONDITIONS:**

   (i) (a) to (c) As per treatments. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) Cotton 21.6.1956, jowar and tur — 25.8.1956. (iv) (a) N.A. (b) Cotton—dibbling, jowar and tur—drilling. (c) 8 to 10 lb./ac. for jowar, 10 to 15 lb./ac. for tur and 2 to 3 lb./ac. for cotton. (d) 6’X2’ cotton and 3’X1’ for jowar and tur. (e) N.A. (v) Nil. (vi) Cotton—Suyog, jowar—B.P.—53, tur—local. (vii) Unirrigated.

2. **TREATMENTS :**

   Same as in expt. no. 54(68) on page 399.

3. **DESIGN :**

   (i) R.B.D. (ii) (a) 46. (b) N.A. (iii) 6. (iv) (a) 31’X30’ for treat. 1 to 11 and for treat. 12 : 62’X30’. (b) For treatments 1 to 11 : 22’X18’. For treatment 12 : 50’X18’. (v) 6’ at either side, 6’ at one end and 3’ at the other end. (vi) Yes.

4. **GENERAL :**

   (i) Normal. (ii) Heavy attack of boll worm. (iii) Seed cotton, jowar and tur grains. (iv) (a) 1948—contd. (modified in 1951 and 1954) (b) As per rotations. (c) Nil. (v) (a) Jalgaon. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS :**

   **I. Cotton**

   (i) 537 lb./ac. (ii) 88.81 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

   Rotation no. : (1) (2) (2) (5) (6) (6) (7) (7) (10) (10) (11) (12)

   Crop : Cm Cm C Cm C Cm C Cm C Cm C

   Precrop : C Cm J T Tm T Tm T Tm J J+T

   Av. yield : 482 415 532 857 351 286 381 342 445 412 1273 665

   S.E./mean = 36.26 lb./ac.

   **II. Jowar**

   (i) 517 lb./ac. (ii) 152.9 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in lb./ac.

   Rotation no. : (3) (4) (4) (5) (8) (8) (9) (9) (10) (10) (11) (12)

   Crop : Jm Jm J J Jm Jm J J J J+T

   Precrop : Jm J Jm Cm T Tm T Tm Cm T Tm C

   Av. yield : 775 708 489 729 369 322 411 417 696 344 335 612

   S.E./mean = 62.4 lb./ac.
III. Tur

(i) 226 lb./ac.  (ii) 90.71 lb./ac.  (iii) Main effect of rotations is highly significant.  (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Rotation no.</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
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<tr>
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<td>210</td>
<td>240</td>
<td>222</td>
<td>279</td>
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</table>

S.E. of marginal mean of rotations = 26.19 lb./ac.
S.E. of marginal mean of manures = 15.12 lb./ac.
S.E. of body of table = 37.03 lb./ac.

Crop: Cotton, Jowar and Tur (Kharif).
Type: -R'.

Object: To study the best rotation for Cotton, Jowar and Tur with and without manures.

1. BASAL CONDITIONS:

2. TREATMENTS:
   Same as in expt. no. 54,68; on page 399.  F.Y.M. applied on 5.5.1957 and P2O5 on 9.9.1957.

3. DESIGN:
   i) R.B.D.  (ii) (a) 46.  (b) N.A.  (iii) 6.  (iv) (a) For treatments 1 to 11: 31'x30'; for treat. 12: 62'x30'.  (b) For treat. 1 to 11: 22'x18'; for treat. 12: 50'x18'.  (v) 6' on either side, 6' on one end and 3' on the other.  (vi) Yes.

4. GENERAL:
   (i) Normal.  (ii) Attack of pink boll worm and spotted boll worm on cotton.  (iii) Seed cotton, Jowar and tur grain.  (iv) (a) 1948—contd.  (modified in 1951 and 1954).  (b) As per rotations.  (c) Nil.  (v) (a) Jalgaon.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

I. Cotton

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<td>595</td>
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<td>340</td>
<td>445</td>
<td>433</td>
<td>549</td>
<td>502</td>
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S.E./mean = 31.35 lb./ac.

II. Jowar

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<tr>
<td>Av. yield</td>
<td>1255</td>
<td>1278</td>
<td>1055</td>
<td>1511</td>
<td>665</td>
<td>551</td>
<td>665</td>
<td>874</td>
<td>1551</td>
<td>773</td>
</tr>
</tbody>
</table>

S.E./mean = 66.7 lb./ac.
### III. Tur

(i) 439 lb./ac. (ii) 98.03 lb./ac. (iii) Effect of rotations is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Rotation no.</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>(11)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tm</td>
<td>367</td>
<td>442</td>
<td>460</td>
<td>417</td>
<td>465</td>
<td>465</td>
<td>436</td>
</tr>
<tr>
<td>T</td>
<td>341</td>
<td>412</td>
<td>447</td>
<td>419</td>
<td>582</td>
<td>456</td>
<td>443</td>
</tr>
<tr>
<td>Mean</td>
<td>354</td>
<td>427</td>
<td>453</td>
<td>418</td>
<td>524</td>
<td>461</td>
<td>439</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of rotations = 28.30 lb./ac.
S.E. of marginal mean of manures = 16.34 lb./ac.
S.E. of body of table = 40.02 lb./ac.

---

### Crop :- Cotton, Jowar and Tur (Kharif).

**Site :-** Agri. Res. Stn., Surat.

Object :- To study the best rotation for Cotton, Jowar and Tur with and without manures.

#### 1. BASAL CONDITIONS :


#### 2. TREATMENTS :

Same as in expt. no. 54(68) on page 399. F.Y.M. spread on 3.6.1958 and P2O5 applied on 5.8.1958.

#### 3. DESIGN :

(i) R.B.D. (ii) (a) 46. (b) N.A. (iii) 6. (iv) (a) For treatments 1 to 11 : 31' x 30'; for treat. 12 : 62' x 30'. (b) For treatment 1 to 11 : 22' x 18'. For treatment 12 : 50' x 18'. (v) Nil. (vi) Cotton—Suyog; Jowar—B.P.—53; Tur—local. (vii) Yes.

#### 4. GENERAL :

(i) Normal. (ii) Boll-worm attack on cotton. (iii) Yield of seed cotton, Jowar and Tur grain. (iv) (a) 1948—contd. (modified in 1951 and 1954). (b) As per rotation. (c) Nil. (v) (a) Jalgaon. (b) N.A. (vi) and (vii) Nil.

#### 5. RESULTS :

### I. Cotton

(i) 594 lb./ac. (ii) 64.49 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Rotation no.</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>(10)</th>
<th>(11)</th>
<th>(12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop</td>
<td>C</td>
<td>Cm</td>
<td>Cm</td>
<td>C</td>
<td>Cm</td>
<td>C</td>
<td>Cm</td>
<td>Cm</td>
<td>Cm</td>
<td>Cm</td>
<td>Cm</td>
<td>C</td>
</tr>
<tr>
<td>Pre. crop</td>
<td>Cm</td>
<td>C</td>
<td>Cm</td>
<td>J</td>
<td>T</td>
<td>Tm</td>
<td>T</td>
<td>Tm</td>
<td>Tm</td>
<td>J</td>
<td>J+T</td>
<td></td>
</tr>
<tr>
<td>Av. yield</td>
<td>706</td>
<td>558</td>
<td>764</td>
<td>931</td>
<td>426</td>
<td>385</td>
<td>436</td>
<td>453</td>
<td>498</td>
<td>503</td>
<td>1029</td>
<td>471</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=26.33 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### II. Jowar

(i) 831 lb./ac. (ii) 145.2 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Rotation no.</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>(11)</th>
<th>(12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop</td>
<td>Jm</td>
<td>Jm</td>
<td>Jm</td>
<td>Cm</td>
<td>J</td>
<td>J</td>
<td>J</td>
<td>Jm</td>
<td>J</td>
<td>J+T</td>
</tr>
<tr>
<td>Pre. crop</td>
<td>Jm</td>
<td>Jm</td>
<td>Jm</td>
<td>C</td>
<td>Tm</td>
<td>T</td>
<td>Tm</td>
<td>Cm</td>
<td>T</td>
<td>C</td>
</tr>
<tr>
<td>Av. yield</td>
<td>1262</td>
<td>1090</td>
<td>1061</td>
<td>1091</td>
<td>479</td>
<td>488</td>
<td>607</td>
<td>687</td>
<td>1322</td>
<td>556</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=59.3 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
III. Tur

(i) 230 lb./ac. (ii) 49.95 lb./ac. (iii) Effect of rotations is significant. (iv) Av. yield of grain in lb./ac.

Rotation no. | (6)  | 7  | (8)  | (9)  | (10) | (11) | Mean
---|---|---|---|---|---|---|---
Pre. crop | C | Cm | J | Jm | J | Cm | Mean
Tm | 197 | 234 | 247 | 231 | 301 | 221 | 238
T | 190 | 223 | 220 | 211 | 272 | 211 | 221
Mean | 194 | 228 | 233 | 221 | 286 | 216 | 230

S.E. of marginal mean of rotation = 14.42 lb./ac.
S.E. of marginal mean of manure = 8.32 lb./ac.
S.E. of body of table = 20.39 lb./ac.


Object :-To study the best rotation for Cotton, Jowar and Tur with and without manures.

1. BASAL CONDITIONS :

2. TREATMENTS:
Same as in exp. no. 54, 68; on page 399.

3. DESIGN:
(i) R.B.D. (ii) (a) 46. (b) N.A. (iii) 6. (iv) (a) For treatments 1 to 11: 31' x 30', treat. 12: 62' x 30'. (b) For treatments 1 to 11: 22' x 18', treat. 12: 50' x 18'. (v) 6' on either sides. 6' on one side and 3' on the other. (vi) Yes.

4. GENERAL:
(i) Uneven growth due to heavy and continuous rains. (ii) Nil. (iii) Yield of seed cotton, jowar and tur grain. (iv) 'a': 1948—contd. modified in 1951 and 1954). (b) As per rotations. (c) Nil. (v) (a) Jalgaon. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

I. Cotton

(i) 629 lb./ac. (ii) 79.39 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of kapas in lb./ac.

Rotation no. | (1) | (2) | (3) | (4) | (5) | (6) | (6) | (7) | (7) | (10) | (10) | (11) | (12) |
---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Crop: | Cm | Cm | Cm | Cm | Cm | Cm | Cm | Cm | Cm | Cm | Cm | Cm | Cm |
Pre. crop: | Cm | Cm | J | J | T | Tm | T | Tm | T | Tm | J+T |
Av. yield | 800 | 545 | 698 | 505 | 386 | 436 | 474 | 536 | 1063 | 410 | 512 | 713 |
S.E./mean = 32.41 lb./ac.

II. Jowar

(i) 598 lb./ac. (ii) 63.32 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of grain in lb./ac.

Rotation no. | (3) | (4) | (4) | (5) | (8) | (8) | (9) | (9) | (10) | (10) | (11) | (11) | (12) |
---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Crop: | Jm | Jm | Jm | Jm | J | Jm | Jm | J | J | J | J | J+T |
Pre. crop: | Jm | Jm | Cm | T | Tm | T | Tm | Cm | T | Tm | C |
Av. yield | 921 | 788 | 829 | 862 | 339 | 368 | 417 | 447 | 820 | 355 | 390 | 642 |
S.E./mean = 25.81 lb./ac.
III. Tur

(i) 171 lb./ac. (ii) 38.36 lb./ac. (iii) Effect of rotations is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Rotation no.</th>
<th>Pre. crop Manures</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
<th>(10)</th>
<th>(11)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tm</td>
<td>Cm J</td>
<td>129</td>
<td>166</td>
<td>192</td>
<td>190</td>
<td>192</td>
<td>160</td>
<td>172</td>
</tr>
<tr>
<td>T</td>
<td>Cm J</td>
<td>153</td>
<td>151</td>
<td>182</td>
<td>184</td>
<td>190</td>
<td>162</td>
<td>170</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>141</td>
<td>158</td>
<td>187</td>
<td>187</td>
<td>191</td>
<td>161</td>
<td>171</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of rotation = 11.07 lb./ac.
S.E. of marginal mean of manure = 6.39 lb./ac.
S.E. of body of table = 15.66 lb./ac.

---

**Crop**: Bajra and Groundnut *(Kharif).*  
**Site**: Agri. Res. Stn., Amreli.

Object:—To study the suitability of cereal and legume mixed cropping.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 19.8.1955. (iv) (a) to (e) N.A. (v) Nil. (vi) N.A. (vii) N.A. (viii) 3 interculturings and 2 weedings. (ix) 15.12. (x) 22.11.1955.

2. TREATMENTS:
   1. Groundnut alone.  
   2. Bajra alone.  
   5. Separate rows of groundnut and bajra in 6 : 1 proportion.  
   7. Separate rows of groundnut and bajra in 10 : 1 proportion.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 2. (iv) (a) 68'×52' (1 and 2), 69'×13' (3 to 7). (b) 60'×52', (1 and 2) and 60'×10' (3 to 7). (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 139.6 Rs./ac. (ii) 20.10 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ac.

**Crop**: Bajra and Groundnut *(Kharif).*  
**Site**: Agri. Res. Stn., Amreli.

Object:—To study the suitability of cereal and legume mixed cropping.
1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Bajra. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 7, 8.7.1956. (iv) (a) N.A. (b) Hand sowing and drilling. (c) 5 lb./ac. (Bajra) and 50 lb./ac. (groundnut). (d) 18° between rows (1 to 6 and 8), 30° between rows (7). (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Bajra—M.S. and groundnut—AH—32. (vii) Unirrigated. (viii) 2 interculturings and 3 weedings. (ix) 26.98°. (x) 19.10.1957.

2. TREATMENTS:
   1. Separate rows of bajra and groundnut in 1:1 proportion.
   2. Separate rows of bajra and groundnut in 1:2 proportion.
   3. Separate rows of bajra and groundnut in 1:3 proportion.
   5. Mixed seed of bajra and groundnut in 1:2 proportion.
   6. Mixed seed of bajra and groundnut in 1:3 proportion.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 33°×21°. (b) 30°×18°. (v) 1.5° around. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (b) 1st year of the experiment. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 232.4 Rs./ac. (ii) 40.34 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>249.9</td>
<td>243.4</td>
<td>244.0</td>
<td>226.5</td>
<td>247.7</td>
<td>190.0</td>
<td>149.4</td>
<td>308.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>20.17 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Object:—To study the suitability of cereal and legume mixed cropping.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Jowar fodder. (c) 5 C.L./ac. of F.Y.M. (ii) (a) Medium black. (b) Refer soil analysis, Amreli. (iii) 1.7.1957. (iv) (a) 1 ploughing and 2 harrowings. (b) Drilling and hand sowing. (c) N.A. (d) 18° between rows. (e) N.A. (v) 5 C.L./ac. of F.Y.M. (vi) Bajra—M.S. and groundnut—AH—32. (vii) Unirrigated. (viii) 3 interculturings. (ix) 27.42°. (x) 9.10.1957.

2. TREATMENTS:
   1. Separate rows of bajra and groundnut in 1:1 proportion.
   2. Separate rows of bajra and groundnut in 1:2 proportion.
   3. Separate rows of bajra and groundnut in 1:3 proportion.
   5. Groundnut alone.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 94°×21°. (b) 90°×18°. (v) 2°×1.5°. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1956—contd. (modified in 1957). (b) No. (c) Nil. (x) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 194.4 Rs./ac. (ii) 20.17 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ac.
Crop :- Wheat and Gram (Rabi),
Object :- To study the suitability of cereal and legume mixed cropping.

1. BASAL CONDITIONS :
(i) (a) Wheat, Gram—Gram, Wheat. (b) Gram. (c) Nil.  
(ii) (a) Medium black. (b) Refer soil analysis, Arnej.  
(iii) 29.10.1956. (iv) (a) 5 harrowings. (b) Drilling. (c) 40 lb./ac. for cereal and 20 lb./ac. for legume. (d) 12’ between rows. (e) N.A. (v) Nil. (vi) Chafa gram, wheat—A 206.  
(vii) Unirrigated (viii) 1 weeding. (ix) 39’.

2. TREATMENTS :
1. Legume alone (Gram).
2. Cereal alone (Wheat).
3. Mixed seed of legume and cereal in 1: 1 proportion.
5. Mixed seed of legume and cereal in 3 : 1 proportion.
7. Separate rows of legume and cereal in 2 : 1 proportion.
8. Separate rows of legume and cereal in 3 : 1 proportion.

3. DESIGN :
(i) R.B.D. (ii) 8. (b) N.A. (iii) 4. (iv) (a) 30’ × 46’. (b) 24’ × 40’. (v) 3’ around. (vi) Yes.

4. GENERAL :
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1958 (modified in 1954). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 115.2 Rs./ac. (ii) 15.72 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ac.

Crop :- Wheat and Gram (Rabi),
Object :- To study the suitability of cereal and legume mixed cropping.

1. BASAL CONDITIONS :
(i) (a) Wheat, Gram—Wheat, Gram. (b) N.A. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Arnej.  
(ii) 13.10.1957. (iv) (a) 6 harrowings. (b) Drilling. (c) 20 lb./ac. (gram) and 40 lb./ac. (wheat). (d) 12’ between rows. (e) N.A. (v) Nil. (vi) Chafa gram, wheat—A 206.  
(vii) Unirrigated (viii) 1 weeding. (ix) 18.37’.

2. TREATMENTS and 3. DESIGN :
Same as in exp. no. 56(3) above.

4. GENERAL :
(i) Poor due to scanty rains. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1958 (modified in 1954). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 55.00 Rs./ac.  
(ii) 9.08 Rs./ac.  
(iii) Treatment differences are highly significant.  
(iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>44.24</td>
<td>77.48</td>
<td>61.82</td>
<td>51.73</td>
<td>46.06</td>
<td>53.32</td>
<td>55.70</td>
<td>49.69</td>
</tr>
</tbody>
</table>

S.E., mean = 4.54 Rs./ac.

Crop :- Wheat and Gram (Rabi).  
Ref :- Gj. 58(1).  
Type :- 'X'.

Object :-To study the suitability of cereal and legume mixed cropping.

1. BASAL CONDITIONS:

(i) (a) N.A.  
(b) Wheat.  
(c) N.A.  
(ii)  
(a) Medium black.  
(b) Refer soil analysis, Arnej.  
(iii) 9.11.1958.  
(iv)  
(a) N.A.  
(b) Drilling.  
(c) 20 lb./ac. 'gram', 40 lb./ac. 'wheat.  
(d) 12'' between rows.  
(e) N.A.  
(f) Nil.  
(g) Chafa gram, wheat A—206.  
(h) Unirrigated.  
(i) 32.4".  
(j) 11.3.1959.

2. TREATMENTS and 3. DESIGN:

Same as in ext. no. 56.3, on page 407.

4. GENERAL:

(i) Good.  
(ii) Nil.  
(iii) Grain yield.  
(b) No.  
(c) Nil.  
(d) N.A.  
(e) 12h between rows:  
(f) N.A.  
(g) Drilling.  
(h) 20 lb./ac. 'gram', 40 lb. (ac. _ wheat  
(i) 12h between rows:  
(j) N.A.  
(k) N.A.  
(l) 20-87.  
(m) Irrigated.  
(n) 99.3'.  
(o) 23.11.1959; groundnut.  

5. RESULTS:

(i) 116.6 Rs.  
(ii) 36.86 Rs.  
(iii) Treatment differences are significant.  
(iv) Av. value of produce in Rs., 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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>72.9</td>
<td>130.7</td>
<td>170.3</td>
<td>131.7</td>
<td>96.6</td>
<td>126.3</td>
<td>106.9</td>
<td>97.3</td>
</tr>
</tbody>
</table>

S.E., mean = 18.43 Rs. ac.

Crop :- Cotton with Paddy, Groundnut, Sann and Chillies (Kharif).  
Ref :- Gj. 59(140).  
Site :- Trial-cum-Demonstration Farm, Bardoli.  
Type :- 'X'.

Object :-To find out the most economic inter-crop that can be grown with Cotton.

1. BASAL CONDITIONS:

(a) Nil.  
(b) Indo-American Cotton trial.  
(c) 40 lb./ac. of N+20 lb./ac. of P2O5.  
(ii) (a) Clay loam.  
(b) Refer soil analysis, Bardoli.  
(iv) (a) N.A.  
(b) Dibbling cotton; drilling; paddy, groundnut and sann, planting; chillies.  
(c) N.A.  
(d) 5''x2'' cotton.  
(e) 2 to 3 seeds/dibble.  
(f) 40 lb./ac. of N as A S and cotton cake and 20 lb./ac. of P2O5.  
(v) 20-87 'cotton', 'paddy.  
(vi) 34-36 AH—32 (groundnut).  
(vii) Irrigated.  
(viii) 3 weedings and 7 interculturings.  
(ix) 99.3'.  
(x) 23.11.1959 (groundnut).  

2. TREATMENTS:

1. Cotton with paddy 5 rows of paddy between cotton).  
2. Cotton with groundnut 3 rows of groundnut between cotton);  
3. Cotton with chillies 2 rows of chillies between cotton);  
5. Cotton alone.

3. DESIGN:

(i) R.B.D.  
(ii)  
(a) 5.  
(b) 210'x48'.  
(iii)  
(4) 48'x40'.  
(b) 36'x30'.  
(iv) 6''x5''.  
(v) Yes.
4. **GENERAL** :

(i) Normal. (ii) Nil. (iii) Seed cotton yield, pod yield of groundnut and grain yield of paddy. (iv) (a) 1959—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Instead of normal rain of 56″ it received 100″ this year. The crop was affected to a large extent. (vii) Nil.

5. **RESULTS** :

(i) 332.2 Rs./ac. (ii) 66.57 Rs./ac. (iii) Treatment differences are significant. (iv) Av. value of the produce in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>268.4</td>
<td>363.5</td>
<td>378.7</td>
<td>278.4</td>
<td>372.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>29.76 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop :- Jowar and Lang (Rabi).**

**Site :- Agri. Res. Stn., Bhuwa.**

Object :- To find out the most advantageous mixture of Jowar and Lang as mixed crop.

1. **BASAL CONDITIONS** :

(i) (a) Nil. (b) Lang. (c) Nil. (ii) (a) Black cotton. (b) N.A. (iii) Jowar and lang on 16.10.1954. (iv) (a) N.A. (b) Drilling. (c) 40 lb./ac. of lang and 6 lb./ac. of jowar. (d) 24″x4″. (e) N.A. (v) Nil. (vi) Jowar No.—8; lang T—2-12. (vii) Unirrigated. (viii) 1 thinning and 1 interculturing. (ix) N.A. (x) Lang on 10.1.1955 and jowar on 3.3.1955.

2. **TREATMENTS** :

A. Lang alone.
B. Jowar alone.
C. 2 rows of Lang + 1 row of Jowar.
D. 4 rows of Lang + 1 row of Jowar.
E. 6 rows of Lang + 1 row of Jowar.
F. 8 rows of Lang + 1 row of Jowar.
G. 10 rows of Lang + 1 row of Jowar.

3. **DESIGN** :

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 2. (iv) (a) 42′ x 30′ for A, B, C and E, 40′ x 30′ for D, 36′ x 30′ for F and 44′ x 30′ for G. (b) 40′ x 30′ for A, B, C and E, 38′ x 30′ for D, 54′ x 30′ for F and 42′ x 30′ for G. (v) 1′ on either side. (vi) Yes.

4. **GENERAL** :

(i) N.A. (ii) Nil. (iii) Grain yield. (iv) 1952—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) N.A.

5. **RESULTS** :

(i) 48.35 Rs./ac. (ii) 23.29 Rs./ac. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>47.19</td>
<td>63.70</td>
<td>62.26</td>
<td>39.22</td>
<td>42.10</td>
<td>45.27</td>
<td>38.72</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>16.47 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop :- Jowar and Lang (Rabi).**

**Site :- Agri. Res. Stn., Bhuwa.**

Object :- To find out the most advantageous mixture of Jowar and Lang as a mixed crop.
1. BASAL CONDITIONS:
(i) (a) Nil. 'b' Lang. 'c' N.I. (ii) 'a' Black cotton. (b) N.A. (iii) Jowar and lang on 17.10.1955. (iv) (a) N.A. (b) Drilling. 'c' 40 lb./ac. of lang and 6 lb./ac. of jowar. (d) 24' x 4'. (e) N.A. (v) Nil. (vi) Jowar No. 8; lang T— 2.12. (vii) Unirrigated. (viii) 1 thinning and 1 weeding. (ix) 31.65'. (x) Jowar on 3.2.1956 and lang on 5.3.1956.

2. TREATMENTS:
A. Lang alone.
B. Jowar alone.
C. 2 rows of Lang + 1 row of Jowar.
D. 4 rows of Lang + 1 row of Jowar.
E. 6 rows of Lang + 1 row of Jowar.
F. 8 rows of Lang + 1 row of Jowar.
G. 10 rows of Lang + 1 row of Jowar.

3. DESIGN:
(i) R.B.D. (ii) 'a' 7. (b) N.A. (iii) 2. (iv) (a) 42' x 30' for A, B, C, and E; 40' x 30' for D; 36' x 30' for F and 44' x 30' for G. (b) 40' x 30' for A, B, C and E; 38' x 30' for D; 34' x 30' for F and 42' x 30' for G. (v) 1' on either side. (vi) Yes.

4. GENERAL:
(i) Jowar crop failed and lang was normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) (a) N.A. (b) Nil. (vi) and (vii) N.A.

5. RESULTS:
(i) 59.0 Rs./ac. ii, 10.27 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>111.4</td>
<td>33.8</td>
<td>65.5</td>
<td>92.6</td>
<td>98.9</td>
<td>111.4</td>
<td>109.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=5.14 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop :- Cotton and Paddy.**

**Site :- Agri. Res. Stn., Dabhoi.**

**Ref :- Gj. 54(31).**

**Type :- 'X'.**

Object :- To find out N and P requirements with and without F.Y.M. of Cotton and Paddy drilled between two cotton lines.

1. BASAL CONDITIONS:

2. TREATMENTS:
All combinations of (1), (2) and (3) (1) 3 levels of N in the form of A/S and G.N.C. in 1:1 ratio: N₀ = 0, N₁ = 30 and N₂ = 60 lb./ac. (2) 3 levels of P₀₂ as Super: P₀ = 0, P₁ = 30 and P₂ = 60 lb./ac. (3) 2 levels of F.Y.M.: F₀ = 0 and F₁ = 5 C.L./ac. F.Y.M. was applied on 8.7.1954. P₀₂ + 1 dose of N was applied on 24.7.1954. 2nd half dose of N was applied on 20.8.1954.

3. DESIGN:
(i) 3² x 2 fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 62' x 36'. (b) 50' x 24'. (v) 6' all round the net plot. (vi) Yes.

4. GENERAL:
(i) The stand of both the crops was very good. But heavy rains in September caused severe lodging of cotton crop. (ii) Nil. (iii) Weight of cotton, paddy and grain. (iv) (a) 1952—1956. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

I Paddy

(i) 266.9 lb./ac. (ii) 60.98 lb./ac. (iii) Main effect of N alone is 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>F_0</th>
<th>F_1</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_0</td>
<td>132.7</td>
<td>307.4</td>
<td>297.2</td>
<td>245.8</td>
<td>239.7</td>
</tr>
<tr>
<td>P_1</td>
<td>140.7</td>
<td>232.6</td>
<td>353.9</td>
<td>242.4</td>
<td>223.1</td>
</tr>
<tr>
<td>P_2</td>
<td>179.2</td>
<td>307.4</td>
<td>450.4</td>
<td>312.3</td>
<td>307.8</td>
</tr>
<tr>
<td>Mean</td>
<td>150.9</td>
<td>282.5</td>
<td>367.2</td>
<td>266.9</td>
<td>256.9</td>
</tr>
</tbody>
</table>

F_0 | 141.4 | 273.0 | 356.2 |
F_1 | 160.3 | 291.9 | 378.1 |

S.E. of marginal mean of N or P = 12.45 lb./ac.
S.E. of marginal mean of F = 10.16 lb./ac.
S.E. of body of N \times P table = 21.56 lb./ac.
S.E. of body of N \times F or P \times F table = 17.60 lb./ac.

II Cotton

(i) 522.0 lb./ac. (ii) 107.1 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>Mean</th>
<th>F_0</th>
<th>F_1</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_0</td>
<td>437.5</td>
<td>536.6</td>
<td>536.2</td>
<td>503.4</td>
<td>506.1</td>
</tr>
<tr>
<td>P_1</td>
<td>444.9</td>
<td>506.8</td>
<td>610.7</td>
<td>520.8</td>
<td>509.1</td>
</tr>
<tr>
<td>P_2</td>
<td>547.5</td>
<td>569.5</td>
<td>508.1</td>
<td>541.7</td>
<td>530.1</td>
</tr>
<tr>
<td>Mean</td>
<td>476.6</td>
<td>537.6</td>
<td>551.7</td>
<td>522.0</td>
<td>515.1</td>
</tr>
</tbody>
</table>

F_0 | 465.9 | 532.9 | 546.6 |
F_1 | 487.3 | 542.3 | 556.8 |

S.E. of marginal mean of N or P = 21.9 lb./ac.
S.E. of marginal mean of F = 17.8 lb./ac.
S.E. of body of N \times P table = 37.9 lb./ac.
S.E. of body of N \times F or P \times F table = 30.9 lb./ac.

Crop :- Cotton and Paddy (Kharif).
Site :- Agri. Res. Stn., Dabhoi.
Ref :- Gj. 55(17).
Type :- 'X'.

Object :- To find out the N, P requirements with and without F.Y.M. on Cotton and Paddy drilled between two cotton lines.

1. BASAL CONDITIONS:

(i) Jowar-Cotton, Paddy. (b) Jowar. (c) Nil. (d) Medium black. (b) Refer soil analysis, Dabhoi. (c) Cotton : 16.6.1955; paddy : 18.6.1955. (d) (a) N.A. (b) Paddy—drilling; cotton—dibbling. (c) Paddy—12 lb./ac. (d) Cotton : 6' \times 2'; paddy drilled between two lines of cotton which are 6' apart. (e) Cotton : 3-4 and thinned to 1 plant/hill. (f) Nil. (g) Cotton : Vijay; paddy : Sárice. (h) Irrigated. (i) 2 thinnings for cotton, 5 weedings and 8 interculturings. (j) 51.18°. (k) Cotton : 5 pickings from 13.2.1956 to 8.4.1956; paddy : 15, 16.10.1955.
2. TREATMENTS

All combinations of \(1', 2', \) and \(3'

\(1\) 3 levels of \(N\) as \(A'S\) and \(G.N.C.\) in 1 : 1 ratio: \(N_0 = 0, N_1 = 30\) and \(N_2 = 60\) lb./ac.

\(2\) 3 levels of \(P_2O_5\): \(P_0 = 0, P_1 = 31\) and \(P_2 = 60\) lb./ac. of \(P_2O_5\).

\(3\) 2 levels of \(F.Y.M.: F_0 = 0\) and \(F_1 = 5\) C.L./ac.

F.Y.M. applied on 14.7.1955, \(P_2O_5 + 1\) N applied on 22.7.1955 and \(1\) N applied on 26.8.1955.

3. DESIGN:

(i) \(3^2\times 2\) fact. in R.B.D. \(\text{(ii) a, 18. (b) N.A. (iii) 3. (iv) a) 62\times 36', (b) 50\times 24', (v) 6\times 6', (vi) Yes.}

4. GENERAL:

(i) Very good but due to heavy rains in August and September cotton crop suffered badly. (ii) Mild attack of stem borer. (iii) Kapas, grain and straw yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:

I Paddy

(i) 480.5 lb./ac. (ii) 129.5 lb./ac. (iii) Main effect of \(N\) alone is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>Mean</th>
<th>F_0</th>
<th>F_1</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_0</td>
<td>292.6</td>
<td>461.0</td>
<td>689.2</td>
<td>480.9</td>
<td>447.2</td>
</tr>
<tr>
<td>P_1</td>
<td>258.5</td>
<td>518.9</td>
<td>615.9</td>
<td>464.4</td>
<td>466.7</td>
</tr>
<tr>
<td>P_2</td>
<td>313.9</td>
<td>529.3</td>
<td>645.6</td>
<td>496.2</td>
<td>529.0</td>
</tr>
</tbody>
</table>

Mean 288.3 503.1 650.2 480.5 491.0 470.1

II Cotton

(i) 345.2 lb./ac. (ii) 97.06 lb./ac. (iii) Main effect of \(N\) and interaction \(NPF\) are highly significant. (iv) Av. yield of \(kapas\) in lb./ac.

<table>
<thead>
<tr>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>Mean</th>
<th>F_0</th>
<th>F_1</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_0</td>
<td>386.6</td>
<td>393.2</td>
<td>274.5</td>
<td>351.4</td>
<td>368.2</td>
</tr>
<tr>
<td>P_1</td>
<td>412.5</td>
<td>374.0</td>
<td>334.7</td>
<td>373.7</td>
<td>407.1</td>
</tr>
<tr>
<td>P_2</td>
<td>384.6</td>
<td>286.9</td>
<td>259.2</td>
<td>310.2</td>
<td>303.4</td>
</tr>
</tbody>
</table>

Mean 394.6 351.4 289.5 345.2 359.6 330.7

S.E. of marginal mean of \(N\) or \(P\) =26.4 lb./ac.

S.E. of marginal mean of \(F\) =21.6 lb./ac.

S.E. of body of \(N\times P\) table =45.8 lb./ac.

S.E. of body of \(N\times F\) or \(P\times F\) table =37.4 lb./ac.
Crop : Cotton and Paddy.  
Ref : Gj. 57(106).  
Type : 'X'.

Object : To find out N and P requirements with and without F.Y.M. for Cotton and Paddy drilled between two lines of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Wheat.  (c) Nil.  (ii) (a) Medium black.  (b) Refer soil analysis, Dabhoi.  (iii) 25.6.1957 (Cotton), 27.6.1957 (Paddy).  (iv) (a) N.A.  (b) Cotton-dibbling and Paddy-drilling.  (c) 12 lb./ac. (Paddy).  

2. TREATMENTS:
   All combinations of (1), (2) and (3).  
   (1) 3 levels of N as A/S+G.N.C. in the ratio of I : 1 : 2.  
   (2) 3 levels of P as Super : P0 = 0, P1 = 30 and P2 = 60 lb./ac.  
   (3) 2 levels of F.Y.M. : F0 = 0 and F1 = 5 C.L./ac.  
   Super applied in two equal doses one on 17.8.1957 and other on 3.9.1957.

3. DESIGN:
   (i) 32 x2 Fact. in R.B.D.  (ii) (a) 18.  (b) N.A.  (iii) 4.  (iv) (a) 6' x 36'.  (b) 50' x 24'.  (v) 6' alround.  
   (vi) Yes.

4. GENERAL:
   (i) Not satisfactory.  (ii) Heavy attack of cotton boll-worm on cotton.  (iii) Seed cotton, paddy grain and fodder.  (iv) (a) 1952—1957 (failed in 1956).  (b) No.  (c) N.A.  (v) and (b) N.A.  (vi) Due to late rains both the crops were affected badly.  (vii) Nil.

5. RESULTS:

   A. Cotton
   (i) 481.8 lb./ac.  (ii) 99.82 lb./ac.  (iii) Main effect of P and interaction PxF are significant. Interaction N x P x F is highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
<th>F0</th>
<th>F1</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>512.5</td>
<td>518.1</td>
<td>496.7</td>
<td>509.1</td>
<td>531.7</td>
<td>486.5</td>
</tr>
<tr>
<td>P1</td>
<td>438.1</td>
<td>529.6</td>
<td>535.7</td>
<td>501.1</td>
<td>492.1</td>
<td>510.2</td>
</tr>
<tr>
<td>P2</td>
<td>389.3</td>
<td>479.9</td>
<td>436.4</td>
<td>435.2</td>
<td>439.2</td>
<td>431.2</td>
</tr>
</tbody>
</table>

Mean 446.6 509.2 489.6

S.E. of P or N marginal mean = 20.38 lb./ac.
S.E. of F marginal mean = 16.64 lb./ac.
S.E. of body of P x N table = 35.29 lb./ac.
S.E. of body of P x F or N x F table = 28.82 lb./ac.

B. Paddy
   (i) 201.9 lb./ac.  (ii) 49.73 lb./ac.  (iii) Only N effect is highly significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
<th>F0</th>
<th>F1</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>149.1</td>
<td>205.5</td>
<td>273.7</td>
<td>209.4</td>
<td>197.1</td>
<td>221.8</td>
</tr>
<tr>
<td>P1</td>
<td>161.1</td>
<td>224.9</td>
<td>233.1</td>
<td>206.3</td>
<td>224.0</td>
<td>188.7</td>
</tr>
<tr>
<td>P2</td>
<td>174.9</td>
<td>176.4</td>
<td>218.9</td>
<td>190.1</td>
<td>196.3</td>
<td>183.8</td>
</tr>
</tbody>
</table>

Mean 161.7 202.2 241.9

S.E. of body of P x F or N x F table = 28.82 lb./ac.
Object:—To find out whether mixed cropping is better as compared to single cropping of legume and cereal in different proportions.

1. BASAL CONDITIONS:
   (i) (a) Maize in kharif and gram in rabi.
   (b) Maize and gram.
   (c) Maize was manured with 5 C.L./ac. of F.Y.M.
   (ii) (a) Light brown.
   (b) Refer soil analysis, Dohad.
   (iii) N.A.
   (iv) (a) 2 ploughings.
   (b) Drilling.
   (c) Nil.
   (v) Nil.
   (vi) N.A.
   (vii) Unirrigated.
   (viii) 2 interculturings.
   (ix) 46.23".
   (x) N.A.

2. TREATMENTS:
   1. Groundnut alone.
   3. Groundnut and maize in the ratio of 2 : 1 rows.
   4. Groundnut and maize in the ratio of 4 : 1 rows.
   5. Groundnut and maize in the ratio of 6 : 1 rows.
   6. Groundnut and maize in the ratio of 8 : 1 rows.
   7. Groundnut and maize in the ratio of 10 : 1 rows.

3. DESIGN:
   (i) R B.D. (ii) (a) 7. (b) N.A. (iii) 2. (iv) (a) 30' x 36'. (b) 26' x 30'. (v) One row on either side and 3' at each end.
   (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A.
   (iii) Grain and pod yield.
   (iv) (a) 1952—1955 (modified in 1952).
   (b) No.
   (c) Nil.
   (v) (a) and (b).
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 57.09 Rs./ac.
   (ii) 14.78 Rs./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>85.73</td>
<td>5.59</td>
<td>73.44</td>
<td>60.04</td>
<td>49.15</td>
<td>54.73</td>
<td>70.93</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=10.45 lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Object:—To find out whether mixed cropping is better as compared to single cropping of legume and cereal in different proportions.

1. BASAL CONDITIONS:
   (i) (a) Maize in kharif and gram in rabi.
   (b) Maize and gram.
   (c) 5 C.L./ac. of F.Y.M.
   (ii) (a) Light brown.
   (b) Refer soil analysis, Dohad.
   (iii) N.A.
   (iv) (a) 2 ploughings.
   (b) Drilling.
   (c) to (e) N.A.
   (v) Nil.
   (vi) Spanish No—5 for groundnut, Gomati for maize.
   (vii) Unirrigated.
   (viii) 3 weedicings and 2-3 interculturings.
   (ix) 32.50".
   (x) N.A.

2. TREATMENTS:
   1. Groundnut alone.
   3. Groundnut and maize in the ratio of 2 : 1 rows.
4. Groundnut and maize in the ratio of 4 : 1 rows.
5. Groundnut and maize in the ratio of 6 : 1 rows.
6. Groundnut and maize in the ratio of 8 : 1 rows.
7. Groundnut and maize in the ratio of 10 : 1 rows.

3. DESIGN:
(i) R.B.D. (ii) 7. (b) N.A. (iii) 2. (iv) (a) 30'×36'. (b) 26'×30'. (v) 2' on either side and 3' at either end of the rows. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Pod' and grain yield. (iv) (a) 1952—1955. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 200.5 Rs./ac. (ii) 25.60 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>124.0</td>
<td>304.1</td>
<td>233.4</td>
<td>192.4</td>
<td>200.2</td>
<td>177.0</td>
<td>172.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>18.10 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Groundnut and Cotton (Kharif).

Object: To study the economics of mixed cropping of groundnut and cotton as compared to that of sowing each crop separately.

1. BASAL CONDITIONS:
(i) (a) Legume—Cereal. (b) Wheat. (c) Nil. (ii) (a) Medium black. (b) Refer soil analysis, Halvad. (iii) 4.7.1959. (iv) (a) 1 ploughing and 2 harrowings. (b) Dibbling. (c) Groundnut : 60 lb./ac. ; Cotton : 10 lb./ac. (d) As per treatments. (e) 2 to 3 seeds/dibble. (v) 10 C.L./ac. of compost broadcast. (vi) Cotton : Co2~170 ; Groundnut : AK-12-24. (vii) Irrigated. (viii) 3 weedings and 3 interculturings. (ix) 34". (x) Groundnut : 20.10.1959 ; Cotton : 7.11.1959.

2. TREATMENTS:
1. Groundnut alone with 2' spacing.
2. Cotton alone with 6' spacing.
3. Cotton alone with 3' spacing.
5. Cotton with 6' spacing+2 rows of Groundnut.
6. Cotton with 6' spacing+3 rows of Groundnut.

3 DESIGN:
(i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a) 40'×36'. (b) 34'×24'. (v) As per spacings. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Light attack of grass-hoppers, flies, aphids and jassids, pod-borers, blck-arm and red leaf disease. Spraying of Endrine twice on cotton. (iii) Kapas and pod yield. (iv) (a) 1959—conid.- (b) —. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 198.5 Rs./ac. (ii) 30.20 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>122.9</td>
<td>213.1</td>
<td>205.7</td>
<td>215.8</td>
<td>219.0</td>
<td>214.3</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>15.10 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Bajra and Groundnut (Kharif).
Ref: Gj. 59(137).

Object: To study the effect of mixed cropping of Bajra and Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Medium black. (b) N.A. (iii) 8.7.1959. (iv) (a) 2 harrowings. (b) Drilling. (c) N.A. (d) 18" between rows. (e) —. (f) Nil. (vi) Bajra: L—11; Groundnut: AK—12—24. (vii) Unirrigated. (viii) 2 interculturings and 2 weedings. (ix) 31.26°. (x) Bajra: 5.11.1959, Groundnut: 4.11.1959.

2. TREATMENTS:
1. Bajra alone.
2. Groundnut alone.
3. One row Bajra plus one row Groundnut.
4. One row Bajra plus two rows Groundnut.
5. One row Bajra plus three rows Groundnut.
6. Two rows Bajra plus one row Groundnut.
7. Three rows Bajra plus one row Groundnut.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 48'×24'. (b) 42'×18'. (v) 3'×3'. (vi) Yes.

4. GENERAL:
   (i) Groundnut: satisfactory; Bajra: very poor. (ii) Nil. (iii) Bajra: grain yield and Groundnut: pod yield. (iv) (a) No. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Bajra crop suffered badly due to excessive rains. (vii) Nil.

5. RESULTS:
   (i) 111.8 Rs./ac. (ii) 15.90 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of the produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>5.62</td>
<td>198.36</td>
<td>108.90</td>
<td>144.77</td>
<td>174.88</td>
<td>74.33</td>
<td>76.06</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>7.95 Rs./ac.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Crop: Cotton-Groundnut (Kharif).
Ref: Gj. 59(24).

Type: 'X'.

Object: To find out the economy of mixed cropping of Cotton and Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) (a) Clayey loam to medium black. (b) N.A. (iii) N.A. (iv) (a) 2 ploughings and 2 harrowings. (b) to (e) N.A. (vi) N.A. (vii) Unirrigated. (viii) 1 interculturings and 1 weeding. (ix) 30°. (x) N.A.

2. TREATMENTS:
2. Cotton alone—6' spacing.
4. Cotton 3' spacing and groundnut one line.
5. Cotton 6' spacing 2 lines of groundnut.
6. Cotton 6' spacing 3 lines of groundnut.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) 120'×108'. (iii) 4. (iv) (a) 40'×36'. (b) 34'×30'. (v) 3' around. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Kapas and pod yield. (iv) (a) N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS

(i) 182.5 Rs./ac. (ii) 18.61 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>96.19</td>
<td>108.90</td>
<td>242.25</td>
<td>207.98</td>
<td>189.08</td>
<td>250.04</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 9.30 lb./ac.</td>
<td></td>
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</tbody>
</table>

_Crop: Cotton, Castor and Groundnut (Kharif)._  
_Ref: Gj. 55(44)._  
_Type: 'X'.

Site: Central Expt. Stn., Junagadh.

Object: To find out the most remunerative mixed cropping in this tract for Cotton, Castor and Groundnut.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton. (c) N.A.  
(ii) (a) Medium black and loamy soil. (b) Refer soil analysis, Junagadh.  
(iii) Groundnut: 3.7.1955; castor: 6.8.1955 and cotton: 5.8.1955. (iv) (a) No ploughing and 2 to 3 harrowings. (b) Dibbling for all crops. (c) N.A. (d) Between rows: 3' for groundnut and castor. (e) 1 ' for cotton and 2' for castor. (f) One for groundnut and castor and 2 to 3 for cotton thinned out to one.  
(v) 5 C.L./ac. of F.Y.M. in furrows applied 15 days before sowing. (vi) Groundnut-Punjab (spreading type); cotton-Kalyan and castor T-3. (vii) Unirrigated. (viii) Two interculturings and three weedicings. (ix) 21.93".  

2. TREATMENTS:

1. Groundnut alone.  
2. Castor alone.  
3. Cotton alone.  
4. 1 row of groundnut and one row of castor.  
5. 1 row of groundnut and one row of cotton.  
6. 1 row of cotton and one row of castor

3. DESIGN:

(i) L. Sq. (ii) (a) 6. (b) N.A. (iii) 6. (iv) 40'x36'. (v) 34'x24'. (vi) 3'x6'. (vi) Yes.

4. GENERAL:

(i) Good. (ii) 2 to 3% tikka attack on groundnut and attack of semi-looper on castor. (iii) Kapas seed and pod yield. (iv) (a) 1952-1957 (modified in 1955). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 147.4 Rs./ac. (ii) 28.52 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>116.5</td>
<td>169.4</td>
<td>192.5</td>
<td>194.6</td>
<td>113.3</td>
<td>98.3</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 11.64 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

_Crop: Cotton, Castor and Groundnut (Kharif)._  
_Ref: Gj. 56(51)._  
_Type: 'X'.

Site: Central Expt. Stn., Junagadh.

Object: To find out the most remunerative mixed cropping in this tract for the crops Cotton, Castor and Groundnut.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton. (c) N.A.  
(ii) (a) Medium black-2' to 2½' deep. (b) Refer soil analysis, Junagadh.  
(iii) N.A. (iv) 40'x36'. (v) Dibbling for all crops. (c) N.A. (d) Between rows: 3' for all crops; between rows: 2' for groundnut, 6' for cotton and 12' for castor. (e) One seed/dibble for groundnut and castor; 2-3 seeds/dibble for cotton. (v) 5 C.L./ac. of F.Y.M. applied in furrows 15 days before sowing. (vi) Groundnut-Punjab-1 (spreading type); cotton-Kalyan and castor T-3. (vii) Unirrigated. (viii) (ix) 59.56". (x) N.A.
2. TREATMENTS:
1. Groundnut alone.
2. Castor alone.
3. Cotton alone.
4. 1 row of groundnut and one row of castor.
5. 1 row of groundnut and one row of cotton.
6. 1 row of cotton and one row of castor.

3. DESIGN:
(i) L. Sq.  (ii) (a) 6.  (b) N.A.  (iii) 6.  (iv) (a) 40′ × 36′.  (b) 34′ × 24′.  (v) 3′ × 6′.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) Cotton-nil, castor—semi-looper and groundnut—aphids and tikka.  (iv) (a) 1952-1957.  (b) No.  (c) Nil.  (v) 3′ × 6′.  (b) Nil.  (vi) Yes.

5. RESULTS:
(i) 113.33 Rs./ac.  (ii) 21.99 Rs./ac.  (iii) Treatment differences are highly significant.  (iv) Av. money value of produce in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. value</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>97.33</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>111.03</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>88.34</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>170.29</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>129.27</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>95.64</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 8.98 Rs./ac.

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Corps: Cotton, Castor & Groundnut (Kharif)  
Ref: Gj. 57(59)  
Site: Central Expt. Stn., Junagadh.  
Type: X

Object: To find out the most remunerative mixed cropping in this tract for Cotton, Castor and Groundnut.

1. BASAL CONDITIONS:

2. TREATMENTS:
1. Groundnut alone.
2. Castor alone.
3. Cotton alone.
4. 1 row of Groundnut and one row of Castor.
5. 1 row of Groundnut and one row of Cotton.
6. 1 row of cotton and one row of Castor.

3. DESIGN:
(i) L. Sq.  (ii) (a) 6.  (b) N. A.  (iii) 6.  (iv) (a) 40′ × 36′.  (b) 24′ × 34′.  (v) 3′ × 6′.  (vi) Yes.

4. GENERAL:
(i) Groundnut was normal but yield was affected adversely due to lack of rains in August.  (ii) Semi-looper attack on Castor and aphids and tikka attack on groundnut.  (iii) Grain and fodder yield.  (iv) 1952-1957 (modified in 1955).  (b) No.  (c) Nil.  (v) 3′ × 6′.  (b) Nil.  (vi) Yes.

5. RESULTS:
(i) 94.84 Rs./ac.  (ii) 36.57 Rs./ac.  (iii) Treatment differences are not significant.  (iv) Av. value of produce in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. value</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>103.56</td>
<td>14.93 Rs.</td>
</tr>
<tr>
<td>2</td>
<td>97.15</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>104.09</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>96.35</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>99.02</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>68.86</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 14.93 Rs./ac.
Object:—To find out the most remunerative mixed cropping in this tract for Groundnut, Cotton and Castor.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Black loamy soil. (b) Refer soil analysis, Junagadh. (iii) 9.7.1958. (iv) (a) 1 harrowing before sowing. (b) and (c) N.A. (d) As per treatments. (e) N.A. (vi) Groundnut: Punjab—I (medium), Cotton: Kalyan and Castor: T3. (vii) Unirrigated. (viii) 4 intercropings and 3 weedings. (ix) 34". (x) Groundnut: 19.11.1958; Castor and Cotton: 6.3.1959.

2. TREATMENTS:
   1. Castor alone.
   2. Cotton alone.
   4. Groundnut one row with 1½' spacing and Castor one row with 1½' spacing.
   5. Groundnut one row with 3' spacing and Castor one row with 3' spacing.
   6. Cotton one row with 1½' spacing and Groundnut one row with 3' spacing.
   7. Groundnut one row with 3' spacing and Cotton one row with 3' spacing.
   8. Cotton one row with 3' spacing and Castor one row with 3' spacing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 50'×18'. (b) 45'×12'. (v) 2.5'×3'. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Attack of tikka was negligible. No control measures have been taken for groundnut or cotton. But Gammexane was dusted in early stages to control the semi-loopers. (iii) Yield of pod for groundnut, cotton bolls, and castor seed. (iv) (a) 1956—contd. (modified but year N.A.). (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 154.4 Rs./ac. (ii) 42.67 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>87.1</td>
<td>82.1</td>
<td>245.6</td>
<td>177.5</td>
<td>150.9</td>
<td>252.1</td>
<td>146.8</td>
<td>93.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=21.34 Rs./ac.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Crop :- Cotton and Groundnut (Kharif). Ref :- Gj. 54(57).
Site :- Central Expt. Stn., Junagadh. Type :- 'X'.

Object:—To find out the most remunerative mixed cropping in this tract for Cotton and Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) N.A. (ii) (a) Medium black, loamy soil. (b) Refer soil analysis, Junagadh. (iii) Groundnut : 15.6.1954 ; Cotton : 30.6.1954. (iv) (a) No ploughing, 2 to 3 harrowings. (b) Dibbling (for all crops). (c) N.A. (d) Between rows—3' for all crops; between plants—2" for groundnut, 6" for Cotton. (e) One for groundnut ; 2 for cotton but thinning out to one. (v) 5 C.L./ac. of F Y.M. applied in furrows 15 days before sowing. (vi) N.A. (vii) Unirrigated. (viii) 2 intercropings and 2 weedings. (ix) 38.33". (x) Groundnut : 20.10.1954 ; Cotton : 12.1.1955.

2. TREATMENTS:
   1. Groundnut alone.
   2. Cotton alone.
   3. 2 rows of cotton and 2 rows of Groundnut.
   4. 2 rows of cotton and 6 rows of Groundnut.

3. DESIGN:
   (i) L. Sq. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 50'×48'. (b) 44'×24'. (v) 3'×12'. (vi) Yes.
4. GENERAL:

(i) Satisfactory. (ii) 2 to 3% attack of tikka. (iii) Kapas and pod yield. (iv) (a) 1952–1957 (modified in 1955). (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 562.4 Rs./ac. (ii) 24.05 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>628.8</td>
<td>417.6</td>
<td>606.8</td>
<td>596.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton and Groundnut (Kharif).

Site :- Central Expt. Stn., Junagadh.

Object :- To find out most remunerative mixed cropping in this tract for Cotton and Groundnut.

1. BASAL CONDITIONS:

(i) Nil. (b) Cotton. (c) N.A. (i) (a) Medium black, 2' to 2' deep. (b) Refer soil analysis, Junagadh. (ii) N.A. (iv) (a) 2 to 3 harrowings. (b) Dibbling. (c) N.A. (d) Between rows—6' (cotton), 2' and 3' (groundnut); Between plants—1' (cotton), 2' (groundnut). (e) Groundnut—1 and cotton 2-3 but thinned out to one. (v) 5 C.L./ac. of F.Y.M. in four rows fifteen days before sowing. (vi) Groundnut : AK—12-24 (bunch type). Cotton : Co—170. (vii) Irrigated. (viii) 2 to 3 interculturing and 3 to 4 weedings. (ix) 59.36°. (x) N.A.

2. TREATMENTS:

1. Groundnut alone.
2. Cotton alone.
3. One row of groundnut and one row of cotton.
4. Two rows of groundnut and one row of cotton.

3. DESIGN:

(i) L. Sq. (ii) a; 4. (b) N.A. (iii) 4. (iv) (a) 40' x 36'. (b) 34' x 24'. (v) 3' x 6'. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) Nil. (iii) N.A. (iv) (a) 1956—contd. (modified in 1958). (b) No. (c) N.A. (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 245.6 Rs./ac. (ii) 31.54 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>128.3</td>
<td>235.0</td>
<td>349.3</td>
<td>269.8</td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Crop :- Cotton and Groundnut.

Site :- Central Expt. Stn., Junagadh.

Object :- To find out the most remunerative mixed cropping for this tract for Cotton and Groundnut.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Cotton. (c) N.A. (i) (a) Medium black, 2' to 2' deep. (b) Refer soil analysis, Junagadh. (ii) Cotton : 19.7.1957 and Groundnut : 19.7.1957. (iv) (a) Two to three harrowings. (b) Dibbling for both crops. (c) N.A. (d) Between rows—6' (cotton); 2' to 3' (groundnut). Between plants—1' (cotton), 2' (groundnut). (e) Groundnut—1, Cotton 2 to 3 but thinned out to 1. (v) 5 C.L./ac. of F.Y.M. in four rows fifteen days before sowing. (vi) Groundnut : AK—12-24 (bunch type). Cotton :

2. TREATMENTS:
1. Groundnut alone.
2. Cotton alone.
3. One row of groundnut and one row of cotton.
4. Two rows of groundnut and one row of cotton.

3. DESIGN:
(i) L. Sq. (ii) (a) 4. (b) N. A. (iii) 4. (iv) (a) 40' x 36'. (b) 34' x 24'. (v) 3' x 6'. (vi) Yes.

4. GENERAL:
(i) Normal growth but yield was adversely affected due to lack of rain in August. (ii) Aphids and tikka attack on groundnut. (iii) Kapas, pod and fodder yield. (iv) (a) 1956—contd. (b) No. (c) N. A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 247.0 Rs./ac. (ii) 50.66 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>99.29</td>
<td>250.49</td>
<td>333.90</td>
<td>304.27</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=25.33 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Object:—To find out the most remunerative mixed cropping for this tract.

1. BASAL CONDITIONS:

2. TREATMENTS:
1. Cotton alone at 3' spacing.
2. Cotton alone at 6' spacing.
4. 1 row of cotton and 1 row of groundnut.
5. 3 rows of groundnut and 1 row of cotton.
6. 2 rows of groundnut and one row of cotton.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N. A. (iii) 4. (iv) (a) 40' x 36'. (b) 34' x 24'. (v) N. A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Tikka attack on groundnut. Geigy 1250 and Blitox sprayed on cotton to control the leaf eating caterpillar. (iii) Kapas and pod yield. (iv) (a) 1956—N. A. (b) No. (c) N. A. (v) (a) and (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 570.4 Rs./ac. (ii) 88.99 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>349.1</td>
<td>767.9</td>
<td>566.9</td>
<td>505.0</td>
<td>584.9</td>
<td>648.5</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=44.50 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Jowar and Tur (Kharif).

Object: To study the effect of sowing in between legume rows in different proportions.

1. BASAL CONDITIONS:
   (i) (a) Jowar—Tur—Cotton. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 30.8.1954. (iv) (a) Two harrowings. (b) Drilling. (c) 10 lb/ac. for both crops. (d) 3' between one weeding and 2 intercullurations. (e) 51.54'. (f) Jowar: 18.2.1955 and tur: 21.4.1955.

2. TREATMENTS:
   1. Kharif jowar alone.
   2. Tur alone.
   3. Tur and jowar mixed sown in 1:1 proportion.
   5. Tur and jowar mixed sown in 2:1 proportion.
   6. Tur and jowar row sown in 1:1 proportion.
   8. Tur and jowar row sown in 3:1 proportion.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 33'X40' (b) 24'X36' for 1:1 and 3:1 proportions and 27'X32' for 2:1 proportion. (v) 6' surrounding the experiment was kept as border (vi) yes.

4. GENERAL:
   (i) Growth was checked due to continuous rains. (ii) 40% attack of stem borer on jowar. Heavy attack of pod borer on tur. (iii) Grain yield. (iv) (a) 1952—N.A. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Season was abnormal. (vii) Nil.

5. RESULTS:
   (i) 55.76 Rs./ac. (ii) 7.96 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>55.20</td>
<td>35.54</td>
<td>70.58</td>
<td>70.83</td>
<td>67.43</td>
<td>51.04</td>
<td>43.48</td>
<td>51.93</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>3.98 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Jowar and Tur (Kharif).

Object: To see the effect of legume (Tur) on Cereal (Jowar) and to keep the fertility of soil.

1. BASAL CONDITIONS:
   (i) (a) Jowar—Tur—Cotton. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 25.7.1955. (iv) (a) Nil. (b) Drilling. (c) Jowar—B.P.-53; tur: 10 lb/ac. (d) 3'X1'. (e) Nil. (v) 26.93'. (f) Jowar—28.2.1956; tur—6.4.1956.

2. TREATMENTS:
   Same as in exp. no. 54(67) above.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 33'X40'. (b) 24'X36' for 1:1 proportions and 3:1 and 27'X52' for 2:1 proportion. (v) N.A. (vi) Yes.

4. GENERAL:
   (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 56.99 Rs./ac. (ii) 5.49 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ac.
Crop :- Jowar and Tur (Kharif).  
Ref :- Gj. 57(64).  
Type :- ‘X’.

Object :- To see the effect of the legume (Tur) on cereal (Jowar) and to keep the fertility of soil.

1. BASAL CONDITIONS:
   (i) (a) Jowar—Tur—Cotton. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 16.8.1957. (iv) (a) Nil. (b) Drilling. (c) 8 lb./ac. for jowar and 10 lb./ac. for tur. (d) 3'x1'. (e) N.A. (v) Nil. (vi) Jowar—B.P.-53; Tur—local. (vii) Unirrigated. (viii) 3 weedings and 3 interculturings. (a) 33.41”. (x) Jowar—26.3.1958; Tur—7.4.1958.

2. TREATMENTS:
   1. Jowar only.  
   2. Tur only.  
   3. Tur+Jowar : mixed cropping in 1:1  
   4. Tur+Jowar : mixed cropping in 2:1  
   5. Tur+Jowar : mixed cropping in 3:1  
   6. Tur+Jowar : row sowing in 1:1  
   7. Tur+Jowar : row sowing in 2:1  
   8. Tur+Jowar : row sowing in 3:1  
The proportion denotes the proportion of seed for each crop.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 33'x40'. (b) 24'x36' for 1:1 and 3:1 proportions and 27'x32' for 2:1 proportion. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 91.75 Rs./ac. (ii) 14.67 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>96.17</td>
</tr>
<tr>
<td>2</td>
<td>48.92</td>
</tr>
<tr>
<td>3</td>
<td>121.13</td>
</tr>
<tr>
<td>4</td>
<td>109.43</td>
</tr>
<tr>
<td>5</td>
<td>100.83</td>
</tr>
<tr>
<td>6</td>
<td>102.09</td>
</tr>
<tr>
<td>7</td>
<td>75.25</td>
</tr>
<tr>
<td>8</td>
<td>33.27</td>
</tr>
</tbody>
</table>

S.E./mean = 7.34 Rs./ac.

Crop :- Jowar and Tur (Kharif).  
Ref :- Gj. 58(47).  
Type :- ‘X’.

Object :- To see the effect of legume (Tur) on cereal (Jowar) and to keep the fertility of soil.

1. BASAL CONDITIONS:
   (i) (a) Jowar—Tur—Cotton. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 5.8.1958; resowing on 20.9.1958 and 6.10.1958. (iv) (a) Nil. (b) Drilling. (c) 8 lb./ac. for jowar; 10 lb./ac. for tur. (d) 3'x1'. (e) N.A. (v) Nil. (vi) Jowar—B.P.-53; Tur—local. (vii) Unirrigated. (viii) 1 weeding and 3 interculturings. (ix) 44.80”. (x) Jowar : 1.4.1959; Tur : 8.4.1959.

2. TREATMENTS:
   Same as in expt. no. 57(64) above.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 33'x40'. (b) 24'x36' for 1:1 and 3:1 proportions and 27'x32' for 2:1 proportion. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Due to continuous rains the crops were washed away and resowing was done. (ii) Armyworm and caterpillers. No control measures taken. (iii) Grain yield. (iv) (a) 1952—contd. (b) Nil. (v) (a and 'b) N.A. (vi and 'vii) Nil.

5. RESULTS:
(i) 71.1 Rs./ac. (ii) 10.89 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>16.76</td>
<td>102.85</td>
<td>93.27</td>
<td>76.57</td>
<td>77.89</td>
<td>56.22</td>
<td>65.42</td>
<td>80.16</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>5.45 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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Crop :- Jowar and Tur (Kharif).
Object :- To see the effect of Tur on Jowar and to keep the fertility of soil.

1. BASAL CONDITIONS:
(i) (a) Jowar—Tur—Cotton. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) 12.8.1959. (iv) (a) N.A. (b) Drilling. (c) 8 lb./ac. for Jowar; 10 lb./ac. for tur. (d) 3' x 1'. (e) —. (v) Nil. (vi) Jowar—B.P.—53; tur—local. (vii) Unirrigated. (viii) 2 weedicings and 2 interculturings. (ix) 70 77°. (x) Jowar: 14.3.1960; tur: April 1960.

2. TREATMENTS:
Same as in exp. no. 57(64) on page 423.

3. DESIGN:
(i) R.B.D. (ii) 8. (a) 24' x 36' for 2 : 1 proportions; 32' x 32' for 2 : 1 proportion. (v) —. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—contd. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 77.06 Rs./ac. (ii) 15.88 Rs./ac. (iii) Treatment differences are highly significant. (iv) Av. value of produce in Rs./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>
</tr>
</thead>
<tbody>
<tr>
<td>Av. value</td>
<td>77.89</td>
<td>41.22</td>
<td>90.49</td>
<td>89.62</td>
<td>99.95</td>
<td>95.79</td>
<td>73.61</td>
<td>47.89</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>7.94 Rs./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Crop :- Cotton and Tur.
Ref :- Gj. 54(66).
Type :- 'X'.
Object :- To study the effect of rabi Tur, a leguminous crop, raised with and without phosphatic manure on kharif Jowar.

1. BASAL CONDITIONS:
(i) (a) Cotton and Tur after Jowar. (b) Jowar. (c) Nil. (ii) (a) Black cotton soil. (b) Refer soil analysis, Surat. (iii) Cotton: 24.6.1954; Tur: 11.10.1954. (iv) (a) 2 harrowings, sowing. (b) Drilling for Tur and dibbling for cotton. (c) N.A. (d) 3' distance between rows and thinning out to 1' distance between plants for tur. 6' x 2' for cotton and thinned. (e) 1 plant/hill for cotton. (v) N.A. (vi) Cotton: Sayog (late), tur: local (medium). (vii) Unirrigated. (viii) 1 thinning, 1 weeding and 3 interculturings. (ix) 81.54°. (x) Cotton on 3.4.1953 and 1.5.1955 and tur on 8.5.1955.
2. TREATMENTS:
1. 0 lb./ac. of P₂O₅ in the form of Superphosphate.
2. 50 lb./ac. of P₂O₅ in the form of Superphosphate.
3. 100 lb./ac. of P₂O₅ in the form of Superphosphate.
4. 150 lb./ac. of P₂O₅ in the form of Superphosphate.
5. Cotton (Soyge).

3. DESIGN:
(i) L. Sq. (ii) N.A. (iii) 5. (iv) 42'x30'. (v) 6' alround. (vi) Yes.

4. GENERAL:
(i) Germination of cotton was good but checked by heavy rain. Tur growth was satisfactory. (ii) There was attack of aphids and pod-borer to tur upto 40%. (iii) Growth, height, number of standing plants and yield. (iv) 1948-1954. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) The analysis of the incomplete Latin square is under taken. (vii) Season was abnormal. Data on cotton was N.A.

5. RESULTS:
(i) 533.97 lb./ac. (ii) 61.3 lb./ac. (iii) Treatments do not differ significantly. (iv) Av. yield of tur in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>534.50</td>
<td>27.42 lb./ac.</td>
</tr>
<tr>
<td>2</td>
<td>519.82</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>522.50</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>559.50</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton and Groundnut (Kharif).

Site :- Agri. Res. Farm, Umrala.

Object :-To study the economy of mixed cropping of Cotton and Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) Medium black. (b) N.A. (iii) 8.7.1956. (iv) (a) N.A. (b) Drilling. (c) N.A. (d) 3' for groundnut, cotton and mixed. (e) —. (v) Nil. (vi) Cotton : C₀₂-170, Groundnut : A-K 12-24. (vii) Unirrigated. (viii) 1 weeding and 1 interculturing. (ix) N.A. (x) Cotton : 28.2.1957; Groundnut : N.A.

2. TREATMENTS:
2. Groundnut alone.
3. Cotton and groundnut mixed cropping (ratio of mixture N.A.).

3. DESIGN:
(i) R.B.D. (ii) N.A. (iii) 6. (iv) 24'x18'. (v) 18'x6'. (vi) 3'x6'. (vi) Yes.

4. GENERAL:
(i) Groundnut : satisfactory ; cotton : not satisfactory. (ii) N.A. (iii) Seed cotton and groundnut pod. (iv) (a) 1956-1957. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 253.42 Rs./ac. (ii) 63.12 Rs./ac. (iii) Treatments differ highly significantly. (iv) Av. value of the produce as a whole in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. value</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>125.70</td>
<td>25.77 Rs./ac.</td>
</tr>
<tr>
<td>2</td>
<td>313.24</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>321.31</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Cotton and Groundnut.

Site :- Agri. Res. Farm, Umrala.

Object :-To study the economy of mixed cropping of Cotton and Groundnut.
1. BASAL CONDITIONS:


2. TREATMENTS:

Main-plot treatments:
All combinations of (1), (2) and (3)

(1) 2 levels of N as A/S: N₀=0 and N₁=9 lb./tree.
(2) 2 levels of P₂O₅ as Super: P₀=0 and P₁=9 lb./tree.
(3) 2 levels of K₂O as Pot. Sul.: K₀=0 and K₁=3.60 lb./tree.

Sub-plot treatments:
3 root stocks: Rₖ=Chiku on Gootie, R₁=Chiku on Chiku and R₂=Chiku on Rayan.

Sub-plots applied in two doses: in April and October, 1954.

3. DESIGN:

(i) Split-plot. (ii) 8 main-plots/block and 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) 4 trees/sub-plot (v) One ring round the main-plot. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Height and girth measurements. No. and wt. of chiku. (iv) (a) 1942—contd. (b) N.A. (v) and (vi) Nil.

5. RESULTS:

(i) 60.4 lb./tree. (ii) 35.01 lb./tree. (b) 26.37 lb./tree. (iii) Main effect of R is significant. All other effects are not significant. (iv) Av. yield of chiku in lb./tree.
Crop :- Chiku.

Site :- Fruit Res. Stn., Gandevi.

Ref :- Gj. 55(24).

Type :- ‘CM’.

Object :- To study the different root stocks used for propagating Chiku in combination with manural effect with regard to growth and yield of plants.

1. BASAL CONDITIONS :
   (i) to (x) Same as in expt. no. 54(37) on page 426.  (xi) 65.51".  (xii) 2.4.1955 to 24.3.1956.

2. TREATMENTS :

   Main-plot treatments :
   All combinations of (1), (2) and (3)
   (1) 2 levels of N as A/S : N₀ = 0 and N₁ = 9.75 lb./tree.
   (2) 2 levels of P₂O₅ as Super : P₀ = 0 and P₁ = 9.75 lb./tree.
   (3) 2 levels of K₂O as Pot. Sul. : K₀ = 0 and K₁ = 3.93 lb./tree.

   Sub-plot treatments :
   3 root stocks : R₀ = Chiku on Gootie, R₁ = Chiku on Chiku and R₂ = Chiku on Rayan.
   Manures applied in two doses : 2/3 in April and 1/3 in October, 1955.

3. DESIGN :
   (i) Split-plot.  (ii) (a) 8 main-plots/replication and 3 sub-plots/main-plot.  (b) N.A.  (iii) 2.  (iv) 2 trees/ sub-plot.  (v) One plant ring round the net plot.  (vi) Yes.

4. GENERAL :
   (i) Normal.  (ii) Nil.  (iii) Height and girth measurements. Wt. and no. of chikus.  (iv) (a) 1942—could.  
   (b) Nil.  (v) and (vi) Nil.

5. RESULTS :
   (i) 151.6 lb./tree.  (ii) (p) 41.74 lb./tree.  (b) 56.41 lb./tree.  (iii) Main effects of N and R are highly significant.
   All other effects are not significant.  (iv) Av. yield of chiku in lb./tree.
Crop :- Chiku.  
Site :- Fruit Res. Stn., Gandevi.  
Ref :- Gj. 56(22).  
Type :- 'CM'.

Object :- To study the different root stocks used for propagating Chiku in combination with manurial effect with regard to growth and yield of plants.

### BASAL CONDITIONS:

1. Same as in expt. no. 54(37), on page 426.  
2. Nil.  
3. Height and girth measurements, wt. and no. of chiku.  
4. (a) 1942—contd.  
5. Nil.  
7. Nil.  
8. Nil.

### TREATMENTS:

#### Main-plot treatments:

- All combinations of (1), (2), and (3):
  1. 2 levels of N as A/S : N₀ = 0 and N₁ = 10.5 lb./tree.  
  2. 2 levels of P₂O₅ as Super : P₀ = 0 and P₁ = 10.51 lb./tree.  
  3. 2 levels of K₂O as Pot. Sul. : K₀ = 0 and K₁ = 4.23 lb./tree.

#### Sub-plot treatments:

- 3 root stocks : R₀ = Chiku on Goatie, R₁ = Chiku on Chiku and R₂ = Chiku on Rayan.

Manures applied in two doses : (i) in April and (ii) in October, 1956.

### DESIGN:

Same as in expt. no. 55(24) on page 427.

### GENERAL:

- Satisfactory.  
- Nil.  
- Height and girth measurements, wt. and no. of chiku.  
- (a) 1942—contd.  
- Nil.  
- Nil.  
- Nil.

### RESULTS:

- 89.6 lb./tree.  
- 33.33 lb./tree.  
- 34.18 lb./tree.  
- Main effects of N and R are highly significant. Interaction N × R is significant. No other effect is significant.  
- Av. yield of chiku in lb./tree.
Object: To study the different root stocks used for propagating Chiku in combination with manurial effect with regard to growth and yield of plants.

1. BASAL CONDITIONS:

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1), (2) and (3).
   (1) 2 levels of N as A/S: N0 = 0 and N1 = 11.28 lb./tree.
   (2) 2 levels of P2O5 as Super: P0 = 0 and P1 = 11.28 lb./tree.
   (3) 2 levels of K2O as Pot. bul.: K0 = 0 and K1 = 4.50 lb./tree.

Sub-plot treatments:
3 root stocks: R0 = Chiku on Gootie, R1 = Chiku on Chiku and R3 = Chiku on Rayan.
Manures applied in two doses: in April and in October, 1957.

3. DESIGN:
   Same as in expt. no. 55(24) on page 427.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Wt. and no. of chiku. (iv) (a) 1942—contd. (b) Nil. (v) and (vi) Nil.

5. RESULTS:
   (i) 99 lb./tree. (ii) (a) 34.62 lb./tree. (b) 26.23 lb./tree. (iii) Main effect of R is highly significant while effect of N is significant. No other effect is significant. (iv) Av. yield of chiku in lb./tree.
## Object
To study the different root stocks used for propagating Chiku in combination with manurial effect with regard to growth and yield of plants.

### BASAL CONDITIONS
- N.A. (i) Life
- Sandy loam. (b) Refer soil analysis, Gandevi.

### TREATMENTS
**Main-plot treatments:**
- All combinations of (1), (2) and (3)
  - (1) 2 levels of N as A/S: N₀=0 and N₁=12 lb./tree.
  - (2) 2 levels of P₂O₅ as Super: P₀=0 and P₁=12 lb./tree.
  - (3) 2 levels of K₂O as Pot. Sul.: K₀=0 and K₁=4.82 lb./tree.

**Sub-plot treatments:**
- 3 root stocks: R₀=Chiku on Gootie, R₁=Chiku on Chiku and R₂=Chiku on Rayan.
- Manures applied in two doses: ½ in April and ½ in October, 1958.

### DESIGN
Same as in experiment no. 55,24; on page 427.

### GENERAL
- Normal. (ii) Nil. (iii) Height and girth measurements. Wt. and no. of Chiku. (iv) (a) 1942—contd. (v) and (vi) Nil.

### RESULTS
- (i) 94.5 lb./tree. (ii) (a) 58.84 lb./tree. (b) 35.16 lb./ac. (iii) Only main effects of N and R are highly significant. (iv) Av. yield of Chiku in lb./tree.

---

### Table: Mean Differences of Crop and Site

<table>
<thead>
<tr>
<th></th>
<th>R₀</th>
<th>R₁</th>
<th>R₂</th>
<th>P₀</th>
<th>P₁</th>
<th>K₀</th>
<th>K₁</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>61</td>
<td>36</td>
<td>113</td>
<td>65</td>
<td>75</td>
<td>72</td>
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<td>N₁</td>
<td>150</td>
<td>92</td>
<td>141</td>
<td>113</td>
<td>143</td>
<td>129</td>
<td>127</td>
<td>128</td>
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<tr>
<td>Mean</td>
<td>105</td>
<td>64</td>
<td>127</td>
<td>89</td>
<td>109</td>
<td>101</td>
<td>97</td>
<td>99</td>
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<tr>
<td>K₀</td>
<td>96</td>
<td>72</td>
<td>132</td>
<td>90</td>
<td>111</td>
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<tr>
<td>K₁</td>
<td>114</td>
<td>55</td>
<td>122</td>
<td>87</td>
<td>106</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>P₀</td>
<td>94</td>
<td>55</td>
<td>117</td>
<td></td>
<td></td>
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<tr>
<td>P₁</td>
<td>116</td>
<td>73</td>
<td>137</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two:
2. R marginal means = 9.27 lb./tree.
3. R means at the same level of N, P or K = 13.12 lb./tree.
4. N, P or K means at the same level of R = 14.63 lb./tree.
S.E. of body of N×P, N×K or P×K table = 9.99 lb./tree.

**Crop:** Chiku.
**Site:** Fruit Res. Stn., Gandevi.
**Ref:** Gj. 58(16).
**Type:** 'CM'.
Object -- To study the different root stocks used for propagating Chiku in combination with manurial effect with regard to growth and yield of plants.

1. BASAL CONDITIONS:
   (i) to (x) same as in exp. no. Gj 54(37) on page 426. (xi) 105.75" (xii) N.A.

2. TREATMENTS:
   Main-plot treatments
   All combinations of (1), (2) and (3)
   (1) 2 levels of N as A/S: \( N_0 = 0 \) and \( N_1 = 12.77 \) lb./tree.
   (2) 2 levels of P.O₅ as Super: \( P_0 = 0 \) and \( P_1 = 12.77 \) lb./tree.
   (3) 2 levels of K₂O as Pot. Sul.: \( K_0 = 0 \) and \( K_1 = 5.13 \) lb./tree.

   Sub-plot treatments
   3 root stocks: \( R_0 = \text{Chiku on Gootie} \), \( R_1 = \text{Chiku on Chiku} \), \( R_2 = \text{Chiku on Rayan} \).
   Manures applied in two doses: \( \$ \) in April \( \$ \) in October 1959.

3. DESIGN:
   Same as exp. no. 55(24) on page 427.

4. GENERAL:
   (i) Medium. (ii) Nil. (iii) Weight and no. of chiku. (vi) (a) 1942—contd. (b) Nil. (v) and (vi) Nil.

5. RESULTS:
   (i) 135.9 lb./tree. (ii) (a) 59.91 lb./tree. (b) 31.52 lb./tree. (iii) Main effects of \( N \) and \( R \) are highly significant. Interactions \( N \times R \) and \( N \times P \) are significant. Other effects are not significant. (iv) Av. yield of chiku in lb./tree.
<table>
<thead>
<tr>
<th></th>
<th>R₀</th>
<th>R₁</th>
<th>R₂</th>
<th>P₀</th>
<th>P₁</th>
<th>K₀</th>
<th>K₁</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>69.5</td>
<td>42.3</td>
<td>162.1</td>
<td>84.1</td>
<td>98.5</td>
<td>96.1</td>
<td>86.4</td>
<td>91.3</td>
</tr>
<tr>
<td>N₁</td>
<td>211.5</td>
<td>108.3</td>
<td>222.1</td>
<td>164.0</td>
<td>197.2</td>
<td>159.9</td>
<td>201.4</td>
<td>180.6</td>
</tr>
<tr>
<td>Mean</td>
<td>140.5</td>
<td>75.3</td>
<td>192.1</td>
<td>124.0</td>
<td>147.8</td>
<td>128.0</td>
<td>143.9</td>
<td>135.9</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. N, P or K marginal means
2. R marginal means
3. R means at the same level of N, P or K
4. N, P or K means at the same level of R
S.E. of body of N×P, N×K or P×K table

Crop :- Mug—Jowar (*Kharif*).  
Ref :- Gj. 57(129).

Site :- Soil Cons. Res. Demonstn. and Training Centre, Vasad. Type :- ‘M’.

Object :- To find out the effective dose of P for Mug and its residual effect on Jowar crop.

I. BASAL CONDITIONS:

(i) (a) *Mug—Jowar*.  (b) and (c) N.A.  (ii) (a) Sandy loam to loam (alluvial in nature).  (b) Refer soil analysis, Vasad.  (iii) 30.6.1957.  (iv) (a) 1 ploughing and 1 harrowing.  (b) Dibbling.  (c) 15 lb./ac.  (d) 12"×6".  (e) 1.  (v) Nil.  (vi) Chinamug (V—781).  (vii) Unirrigated.  (viii) One interculturing.  (ix) 25.03°.  (x) 31.8.1957 and 4.9.1957.

2. TREATMENTS.

3 doses of P₂O₅ as Super: P₀=0, P₁=30 and P₂=60 lb./ac.

P₂O₅ applied to Mug crop on 29.6.1957.

3. DESIGN:

(i) R.B.D.  (ii) (a) 3.  (b) N.A.  (iii) 6.  (iv) (a) 24’×30’.  (b) 22’×28’.  (v) 1’ around the net plot.  (vi) Yes.

4. GENERAL:

(i) Good.  (ii) Nil.  (iii) Pod and top yield.  (iv) (a) 1957—1960.  (b) Yes.  (c) N.A.  (v) (a) and (b) N.A.

(vi) Nil.  (vii) No rains after August and hence Jowar crop could not be taken.

5. RESULTS:

(i) 767 lb./ac.  (ii) 152.2 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of pcd in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>740</td>
<td>775</td>
<td>785</td>
</tr>
</tbody>
</table>

S.E./mean = 62.14 lb./ac.

Crop :- Chinamug and Jowar (*Kharif*).  
Ref :- Gj. 58(130).

Site :- Soil Cons. Res. Demonstn. and Training Centre, Vasad.  Type :- ‘M’.

Object :- To find out the effective dose of P for Mug and its residual effect on succeeding Jowar crop.
1. BASAL CONDITIONS:
   (iv) (a) 1 ploughing and 1 harrowing.  (b) Mug : dibbling, jowar : drilling.  (c) Mug : 15 lb./ac., jowar : 40 lb./ac.; (d) 12"x6" for jowar and for mug 12".  (e) (v) Nil.  (vi) Chinamug (V—781), Sundhia (S—1049).

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 57(129) on page 432.  P2O5 applied to mug on 26.6.1958.

4. GENERAL:
   (i) Normal.  (ii) Nil.  (iii) Pod and top yield for mug and fodder yield for jowar.  (iv) (a) 1957—1960.  (b) Yes.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

RESULTS:

Chinamug
   (i) 392 lb./ac.  (ii) 50.35 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>340</td>
<td>402</td>
<td>433</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>20.56 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Jowar
   (i) 1388 lb./ac.  (ii) 129.4 lb./ac.  (iii) Treatment differences are not significant.  (iv) Av. yield of fodder in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1324</td>
<td>1379</td>
<td>1461</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>52.83 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Chinamug and Jowar (Kharif).  Ref :- Gj. 59(147).
Site :- Soil Cons. Res. Demonstn. and Training Centre, Vasad.  Type :- ‘M’.

Object :- To find out the effective dose of P for Mug and its residual effect on succeeding Jowar crop.

BASAL CONDITIONS:
   (i) Mug—Jowar.  (b) Jowar and Mug.  (c) Nil for jowar and as per treatments for mug.  (ii) (a) Sandy loam to loam (alluvial in nature).  (b) Refer soil analysis, Vasad.  (iii) Mug : 4.7.1959; jowar : 27.5.1959.  (iv) (a) 1 ploughing and 1 harrowing.  (b) Mug dibbled and jowar drilled.  (c) Mug : 15 lb./ac.; jowar : 40 lb./ac.
   (d) Mug : 12"x6"; jowar : 12".  (e) Mug : 1.  (v) Nil.  (vi) Chinamug (V—781); Sundhia (S—1049).

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 57(129) on page 432.  P2O5 applied to mug crop on 28.6.1959.

4. GENERAL:
   Same as in expt. no. 58(130) on page 432.

5. RESULTS:

Chinamug
   (i) 246 lb./ac.  (ii) 25.88 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>202</td>
<td>251</td>
<td>284</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>10.57 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
434

Jowar

(i) 1292 lb./ac. (ii) 143.6 lb./ac. (iii) Treatment differences are significant. (iv) Av. yield of fodder in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1167</td>
<td>1414</td>
<td>1296</td>
</tr>
</tbody>
</table>

S.E./mean = 58.64 lb./ac.

Crop :- Cotton (Kharif).
Site :- Soil Cons. Res. Demonstn. and Training Centre, Vasad. Type :- 'M'.

Object :- To find out the effective dose of N for Cotton with Sannhemp grown in situ between cotton rows.

1. BASAL CONDITIONS :
   (i) 'a' Cotton—Bajra+mug. (b) Bajra and mug. (c) Nil. (ii) (a) Sandy loam to loam (alluvial in nature). (b) Refer soil analysis, Vasad. (iii) 13.7.1957. (iv) (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c) Cotton : 8 lb./ac., sann : 40 lb./ac. (d) Cotton : 3'×1'. (e) N.A. (v) Sann—G.M. (vi) \( CO_2 \)—134. (vii) Unirrigated. (viii) 5 interculturings. (ix) 25.03°. (x) 26.11.1957 to 21.1.1958 (5 pickings).

2. TREATMENTS :
   4 doses of N as A/S : \( N_2 = 20 \), \( N_3 = 40 \) and \( N_4 = 60 \) lb./ac. N applied on 24.8.1957 in bands 6" on either side of cotton plants.

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 50'×25'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Crop was not satisfactory due to shortage of rains. (ii) Nil. (iii) Seed cotton yield. (iv) (a) 1957—1961. (b) Nil. (c) Nil. (v) 'a' and (b) N.A. (vi) No rain received after manuring. (vii) Nil.

5. RESULTS :
   (i) 220 lb./ac. (ii) 42.18 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed cotton in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>209</td>
<td>216</td>
<td>237</td>
<td>219</td>
</tr>
</tbody>
</table>

S.E./mean = 17.22 lb./ac.

Crop :- Cotton (Kharif).
Site :- Soil Cons. Res. Demonstn. and Training Centre, Vasad. Type :- 'M'.

Object :- To find out the effective dose of N for Cotton with Sannhemp grown in situ between cotton rows.

1. BASAL CONDITIONS :
   (i) 'a' Cotton—Bajra+mug. (b) Bajra and mug. (c) Nil. (ii) (a) Sandy loam to loam (alluvial in nature). (b) Refer soil analysis, Vasad. (iii) 6.7.1958. (iv) (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c) 8 lb./ac. (d) 3'×1'. (e) N.A. (v) 3500 lb./ac. of sann G.M. (vi) \( CO_2 \)—134. (vii) Unirrigated. (viii) 7 interculturings. (ix) 42.44°. (x) 5.12.1958 to 25.2.1959 (10 pickings).

2. TREATMENTS :
   Same as in exp. no. 57(131) above.
   \( N \) as A/S applied on 24.7.1958 in bands 6" on either side of cotton plants.
3. DESIGN:  
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 45'x25'. (b) 43'x23'. (v) 1'x1'. (vi) Yes.

4. GENERAL:  
(i) Normal. (ii) Attack of pink boll-worms and red cotton bugs. Controlled by applying Endrex-20. (iii) Seed cotton yield. (iv) (a) 1957—1961. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:  
(i) 651.5 lb./ac. (ii) 74.83 lb./ac. (iii) Treatment differences are highly significant. (iv) Av. yield of seed cotton in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>543</td>
<td>643</td>
<td>686</td>
<td>734</td>
</tr>
<tr>
<td>S.E./mean =</td>
<td>30.55 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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

**Ref :- Gj. 59(148).**  
**Site :- Soil Cons. Res. Demonstn. and Training Centre, Vasad. Type :- 'M'.**

Object:—To find out the effective dose of N for Cotton with Sannhemp grown in situ between cotton rows.

1. BASAL CONDITIONS:  
(i) (a) Cotton—Bajra+Mug. (b) Bajra and mud. (c) Nil. (ii) (a) Sandy loam to loam (alluvial in nature). (b) Refer soil analysis, Vasad. (iii) 2'7.6.1959. (iv) (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c) 8 lb./ac. (d) 3'x1'. (e) —. (v) 5924 lb./ac. of same—G.M. (vi) CO₂—134'. (vii) Unirrigated. (viii) 4 weedicings and 2 harrowings. (ix) 44.22'. (x) 30.12.1959 to 3.4.1960.

2. TREATMENTS:  
Same as in exp. no. 57(131) on page 434. N applied on 24.7.1959.

3. DESIGN:  
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 50'x25'. (b) 46'x21'. (v) 2'x2'. (vi) Yes.

4. GENERAL:  
(i) Not satisfactory. (ii) Nil. (iii) Yield of seed cotton. (iv) (a) 1957—1961. (b) No. (c) Nil. (v) (a) and (b) Nil. (vi) and (vii) Boll formation and hence yield was not good due to excessive rains.

5. RESULTS:  
(i) 202 lb./ac. (ii) 47.80 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed cotton in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>167</td>
<td>199</td>
<td>220</td>
<td>222</td>
</tr>
<tr>
<td>S.E./mean =</td>
<td>19.52 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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

**Ref :- Gj. 57(132).**  
**Site :- Soil Cons. Res. Demonstn. and Training Centre, Vasad. Type :- 'M'.**

Object:—To study the response of Cotton to different forms of nitrogenous fertilizers in combination with a crop of Guar.

1. BASAL CONDITIONS:  
(i) (a) Cotton+Guar—Jowar+cowpea. (b) Jowar+cowpea. (c) Nil. (ii) (a) Sandy loam to loam. (b) Refer soil analysis, Vasad. (iii) 1.7.1957. (iv) (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c) 8 lb./ac. (d) 3'x1'. (e) 1. (v) Nil. (vi) CO₂—134'. (vii) Unirrigated. (viii) 4 interculturings. (ix) 25.04'. (x) 27.11.1957 to 26.2.1958 (5 pickings).
2. TREATMENTS:

3 sources of N : \( S_1 = A/S, S_2 = A/C \) and \( S_3 = A/S/N \)
40 lb./ac. of N applied on 19.8.1957 in bands 6" on either side of cotton rows.

3. DESIGN:

(i) R.B.D. (ii) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 30' x 32'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Not satisfactory. (ii) Nil. (iii) Seed cotton yield. (iv) 1957—1961. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) The expt. was conducted under abnormal conditions as there were no rains after application of N. (vii) Guar sown between cotton rows.

5. RESULTS:

(i) 115 lb./ac. (ii) 28.95 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed cotton in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>99</td>
<td>117</td>
<td>129</td>
</tr>
</tbody>
</table>

S.E./mean = 12.94 lb./ac.

---

**Crop:** Cotton (*Kharif*).

**Site:** Soil Cons. Res. Demonstration and Training Centre, Vasad. **Type:** 'M'.

Object:—To study the response of Cotton to different forms of nitrogenous fertilizers in combination with leguminous cover crop of Guar.

1. BASAL CONDITIONS:

(i) a) Cotton+guar—Jowar+cowpea. (b) Jowar+cowpea. (c) Nil. (ii) (a) Sandy loam to loam. (b) Refer soil analysis, Vasad. (iii) 5.7.1958. (iv; (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c) 8 lb. ac. d) 3' x 1'. (e) 1. (v) Nil. (vi) \( CO_2 = 134. \) (vii) Unirrigated. (viii) 3 interculturings. (ix) 42.44'. (x) 15.11.1958 to 1.3.1959: (xi) No plucking.

2. TREATMENTS:

Same as in expt. no. 57(132) on page 435. 40 lb./ac. of N was applied on 24.7.1958.

3. DESIGN:

(i) R.B.D. (ii) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 30' x 32'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Not good. (ii) Nil. (iii) Seed cotton yield. (iv) (a) 1957—1961. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Guar plants had excellent growth due to good rains. This resulted in poor growth of cotton. (vii) Nil.

5. RESULTS:

(i) 224 lb./ac. (ii) 78.72 lb./ac. (iii) Treatment differences are not significant. (iv) Av. yield of seed cotton in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>197</td>
<td>229</td>
<td>247</td>
</tr>
</tbody>
</table>

S.E./mean = 32.13 lb./ac.

---

**Crop:** Cotton (*Kharif*).

**Site:** Soil Cons. Res. Demonstration and Training Centre, Vasad. **Type:** 'M'.

Object:—To study the response of Cotton to different forms of nitrogenous fertilizers in combination with groundnut as cover crop.
1. **BASAL CONDITIONS**:

   (i) (a) Cotton + Groundnut — Jowar + cowpea.  
       (b) Jowar + cowpea.  
       (c) Nil.  
   (ii) (a) Sandy loam to loam.  
       (b) Refer soil analysis, Vasad.  
       (iii) 30.6.1959.  
       (iv) (a) 1 ploughing and 1 harrowing.  
       (b) Dibbling.  
       (c) 8 lb./ac.  
       (d) 3' x 1'.  
       (e) N.A.  
       (v) 5 tons/ac. of F.Y.M. applied on 26.5.1959.  
       (vi) CO₂—134.  
       (vii) Unirrigated.  
       (viii) 3 weedings and 1 harrowing.  
       (ix) 44.22".  

2. **TREATMENTS**:

   **Main-plot treatments**:
   - 2 treatments: T₁ = Cotton with groundnut as cover crop (2 rows of groundnut in between cotton rows) and T₂ = Cotton alone (no cover crop).

   **Sub-plot treatments**:
   - 3 sources of 40 lb./ac. of N: S₁ = A/S, S₂ = A/C and S₃ = A/S/N.  
   N applied on 1.8.1959.

3. **DESIGN**:

   (i) Split-plot.
   (ii) (a) 2 main-plots/replication; 3 sub-plots/main-plot.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) 41.4' x 23.7'.  
   (b) 34.8' x 17.1'.  
   (v) 3.3' alround the net plot.  
   (vi) Yes.

4. **GENERAL**:

   (i) Not satisfactory due to frequent and heavy rains.  
   (ii) Nil.  
   (iii) Seed cotton.  
   (iv) (a) 1957—1961.  
   (b) No.  
   (c) Nil.  
   (v) (a) and (b) N.A.  
   (vi) Frequent and heavy rains.  
   (vii) Nil.

5. **RESULTS**:

   (i) 105 lb./ac.  
   (ii) (a) 19.58 lb./ac.  
   (b) 24.96 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of seed cotton in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₁</td>
<td>105</td>
<td>111</td>
<td>95</td>
</tr>
<tr>
<td>T₂</td>
<td>99</td>
<td>109</td>
<td>110</td>
</tr>
<tr>
<td>Mean</td>
<td>102</td>
<td>110</td>
<td>103</td>
</tr>
</tbody>
</table>

   S E. of difference of two
   
   1. T marginal means = 7.99 lb./ac.
   2. S marginal means = 12.48 lb./ac.
   3. S means at the same level of T = 17.64 lb./ac.
   4. T means at the same level of S = 16.47 lb./ac.

---

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

**Ref :- Gj. 58(131).**

**Site :- Soil Cons. Res. Demonsta. and Training Centre, Vasad.**

**Type :- 'M'.**

Object :- To study the response of bidi Tobacco to different forms of nitrogenous fertilizers in combination with sannhemp grown in situ.

1. **BASAL CONDITIONS**:

   (i) (a) Tobacco — Kodra + Tur.  
       (b) Kodra + Tur.  
       (c) Nil.  
   (ii) (a) Sandy loam to loam.  
       (b) Refer soil analysis, Vasad.  
       (iv) (a) 1 ploughing and 1 harrowing.  
       (b) Transplanting.  
       (c) —.  
       (d) 3' x 3'.  
       (e) 1 plan/hill.  
       (f) Sann green manure at 9184 lb./ac. applied on 25.7.1958.  
       (g) Bidi tobacco K — 20.  
       (h) Unirrigated.  
       (i) 6 interculturings.  
       (ix) 42.44°.  
       (x) 19.11.1958 to 19.2.1959.

2. **TREATMENTS**:

   3 sources of 80 lb./ac. of N: S₁ = A/S, S₂ = A/C and S₃ = A/S/N.  

3. **DESIGN**:

   (i) R.B.D.  
   (ii) (a) 3.  
   (b) N.A.  
   (iii) 6.  
   (iv) (a) 48' x 30'.  
   (b) 42' x 24'.  
   (v) 3' alround the net plot.  
   (vi) Yes.
4. GENERAL:
   (i) Normal.  (ii) Nil.  (iii) Cured tobacco.  (iv) (a) 1958-1961.  (b) No.  (c) Nil.  (v) (a) and (b) N.A. 
   (vi) and (vii). Actually the expt. was to be started in 1957-1958 but due to failure of monsoon tobacco 
   could not be sown.

5. RESULTS:
   (i) 525 lb./ac.  (ii) 72.97 lb./ac.  (iii) Treatment differences are highly significant.  (iv) Av. yield of tobacco 
   in lb./ac.
   Treatment  
   S₁  S₂  S₃
   Av. yield 560 406 610
   S.E./mean = 29.79 lb./ac.

---

**Crop:** Tobacco (*Kharif*).  
**Site:** Soil Cons. Res. Demonstn. and Training Centre, Vasad.  
**Type:** 'M'.

Object:—To study the response of bidi Tobacco to different forms of nitrogenous fertilizers in combination 
with sannhemp grown in situ.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—*Kodra+Tur*.  (b) *Kodra+Tur*.  (c) Nil.  (ii) (a) Sandy loam to loam.  (b) Refer soil 
   analysis, Vasad.  (iii) Tobacco: 21.8.1959; sann: 28.6.1959.  (iv) (a) 1 ploughing and 1 harrowing.  (b) 
   Transplanting.  (c) —.  (d) 3'×3'.  (e) 1 plant/hill.  (v) Sann as G.M. at 11,648 lb./ac. applied in 13.8.1959.  

2. TREATMENTS:
   3 sources of 80 lb./ac. of N: S₁=A/S, S₂=A/C and S₃=A/S/N.  
   N applied on 27.8.1959.

3. DESIGN:
   (i) R.B.D. (ii) 3.  (b) N.A.  (iii) 6.  (iv) (a) 39'×27'.  (b) 33'×21'.  (v) 3' around the net plot.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) Nil.  (iii) Cured tobacco.  (iv) (a) 1958-1961.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 1109 lb./ac.  (ii) 101.2 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of tobacco in lb./ac.
   Treatment  
   S₁  S₂  S₃
   Av. yield 1098 1083 1146
   S.E./mean =41.32 lb./ac.

---

**Crop:** Tobacco (*Kharif*).  
**Site:** Soil Cons. Res. Demonstn. and Training Centre, Vasad.  
**Type:** 'M'.

Object:—To determine the optimum dose of N for bidi Tobacco along with sannhemp grown in situ to 
serve as cover crop.

1. BASAL CONDITIONS:
   (i) (a) Tobacco—*Kodra+Tur*.  (b) *Kodra+Tur*.  (c) Nil.  (ii) (a) Sandy loam to loam.  (b) Refer soil 
   analysis, Vasad.  (iii) Tobacco: 21.8.1959; sannhemp: 25.6.1959.  (iv) (a) 1 ploughing and 1 harrowing.  (b) 
   Transplanting.  (c) —.  (d) 3'×3'.  (e) 1 plant/hill.  (v) Sann as G.M. at 5050 lb./ac. applied on 3.8.1959.  
   (vi) *Bidi* tobacco.  (vii) Unirrigated.  (viii) 3 weedicings and 5 interculturings.  (ix) 44.22'.  
2. TREATMENTS:

4 doses of N as A/S: \( N_0 = 0 \), \( N_1 = 67 \), \( N_2 = 90 \) and \( N_3 = 112 \) lb./ac.


3. DESIGN:

(i) R.B.D.  (ii) 4.  (b) N.A.  (iii) 6.  (iv) (a) 44.3'×26.6'.  (b) 38.3'×20.6'.  (v) 3' alround the net plot.  (vi) Yes.

4. GENERAL:

(i) Good.  (ii) Nil.  (iii) Cured tobacco yield:  (iv) (a) 1959—contd.  (b) No.  (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 1098 lb./ac.  (ii) 117.9 lb./ac.  (iii) Treatment differences are significant.  (iv) Av. yield of tobacco in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>965</td>
<td>1147</td>
<td>1125</td>
<td>1155</td>
</tr>
</tbody>
</table>

S.E./mean = 48.13 lb./ac.

---

**Crop:** Grasses (Kharif).  
**Site:** Soil Cons. Res. Demonstn. and Training Centre, Vasad.  
**Type:** 'MV'.

Object:—To study the development of canopy and the yield of promising grasses when applied with N on bench terrace faces.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Grasses.  (c) Nil.  (ii) (a) Sandy loam to loam.  (b) Refer soil analysis, Vasad.  (iii) 11.7.1958 to 23.7.1958.  (iv) (a) Nil.  (b) Dibbling.  (c) 2.68 lb./ac.  (d) 12'×6'.  (e) N.A.  (v) Nil.  (vi) As per treatments.  (vii) Unirrigated.  (viii) Nil.  (ix) 42.44'.  (x) 1.10.1958 to 18.11.1958.

2. TREATMENTS:

Main-plot treatments
3 species of grasses: \( V_1 = Panicum antidotale \), \( V_2 = Dicanthium annulatum \) and \( V_3 = Cynodon dactylon \).

Sub-plot treatments
2 levels of N: \( N_0 = 0 \) and \( N_1 = 40 \) lb./ac.

N as A/S was applied on 18.8.1958.

3. DESIGN:

(i) Split-plot.  (ii) (a) 3 main-plots/replication; 2 sub-plots/main-plot.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 25'×6'.  (v) Nil.  (vi) Yes.

4. GENERAL:

(i) Normal.  (ii) Nil.  (iii) Green fodder yield.  (iv) (a) 1958−1960.  (b) and (c) Nil.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 4065 lb./ac.  (ii) (a) 3022 lb./ac.  (b) 113.8 lb. ac.  (iii) Main effect of V is significant while effect of N and interaction V×N are highly significant.  (iv) Av. yield of green fodder in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_0 )</td>
<td>4017</td>
<td>3291</td>
<td>1258</td>
<td>2855</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>8688</td>
<td>4646</td>
<td>2493</td>
<td>5276</td>
</tr>
<tr>
<td>Mean</td>
<td>6352</td>
<td>3968</td>
<td>1875</td>
<td>4065</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 1234.0 lb./ac.
2. N marginal means = 37.9 lb./ac.
3. N means at the same level of V = 65.7 lb./ac.
4. V means at the same level of N = 1234.0 lb./ac.
Crop :- Grasses (Kharif).

Site :- Soil Cons. Res. Demonstn. and Training Centre, Vasad. Type :- ‘MV’.

Object :- To study the development of canopy and the yield of promising grasses when applied with N on bench terrace faces.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) As per treatments. (c) Nil. (ii) (a) Sandy loam to loam. (b) Refer soil analysis, Vasad. (iii) 7.7.1958 to 23.7.1958. (iv) (a) Nil. (b) Dibbling. (c) 2.68 lb./ac. in nursery bed. (d) 12” x 6”. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 44.22”. (x) 21.7.1959, 2.9.1959 and 5.12.1959.

2. TREATMENTS:
   Same as in expt. no. 58(128) on page 439.
   N applied on 21.7.1959.

3. DESIGN and 4. GENERAL:
   Same as in expt. no. 58(128), on page 439.

5. RESULTS:
   (i) 16624 lb./ac. (ii) 9544 lb./ac. (b) 2828 lb./ac. (iii) Main effect of V is significant while effect of N is highly significant and interaction V X N is not significant. (iv) Av. yield of green fodder in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>177</td>
<td>257</td>
<td>123</td>
<td>18582</td>
</tr>
<tr>
<td>N1</td>
<td>161</td>
<td>198</td>
<td>792</td>
<td>14665</td>
</tr>
<tr>
<td>Mean</td>
<td>16952</td>
<td>22772</td>
<td>10147</td>
<td>16624</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 3596 lb./ac.
2. N marginal means = 943 lb./ac.
3. N means at the same level of V = 1633 lb./ac.
4. V means at the same level of N = 4064 lb./ac.

Crop :- Grasses (Kharif).

Site :- Soil Cons. Res. Demonstn. and Training Centre, Vasad. Type :- ‘MV’.

Object :- To study the response of some popular draught resistant grasses to the application of N on bunds.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Grasses. (c) Nil. (ii) (a) Sandy loam to loam. (b) Refer soil analysis, Vasad. (iii) 1.7.1959 to 6.7.1959. (iv) (a) Nil. (b) Dibbling. (c) 2.68 lb./ac. in nursery bed. (d) 1’ x 1’. (e) 1 seedling/hill. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 1 interculturing. (ix) 44.22”. (x) 3 cuttings from 23.8.1959 to 23.10.1959.

2. TREATMENTS:
   Main-plot treatments :
   6 species of grasses : V1 = Anaphalis glabra, V2 = Andropogon ischaemum, V3 = Dichanthium annulatum, V4 = Pannicum antidiale, V5 = Pennisetum canchroides and V6 = Pennisetum ciliare.

Sub-plot treatments :
   2 doses of N as 1/5 : N0 = 0 and N1 = 40 lb./ac.
   N applied on 22.7.1959.

3. DESIGN:
   (i) Split-plot. (ii) 3 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 5. (iv) (a) 32.8’ x 3.28’ (v) Nil. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Green forage yield. (iv) (a) 1959—61. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 14517 lb./ac. (ii) (a) 5201 lb./ac. (b) 1082 lb./ac. (iii) Main effects of V and N are highly significant. Interaction V x N is not significant. (iv) Av. yield of green fodder 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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</thead>
<tbody>
<tr>
<td>N0</td>
<td>3569</td>
<td>18058</td>
<td>9082</td>
<td>20645</td>
<td>18004</td>
<td>23857</td>
<td>15536</td>
</tr>
<tr>
<td>N1</td>
<td>2980</td>
<td>15577</td>
<td>6352</td>
<td>17754</td>
<td>16951</td>
<td>21377</td>
<td>13498</td>
</tr>
<tr>
<td>Mean</td>
<td>3275</td>
<td>16818</td>
<td>7717</td>
<td>19195</td>
<td>17478</td>
<td>22617</td>
<td>14517</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. V marginal means = 2326 lb./ac.
2. N marginal means = 279 lb./ac.
3. N means at the same levels of V = 685 lb./ac.
4. V means at the same level of N = 2375 lb./ac.

Ref: Gj. 57(130).

Object: To study the response of cultivated legumes to phosphatic manuring which are likely to serve as cover crops.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) Sandy loam to loam. (b) Refer soil analysis, Vasad. (iii) 4.7.1957. (iv) (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c) N.A. (d) 1’ x 1’. (e) 1. (v) Nil. (vi) Improved strains. (vii) Unirrigated. (viii) 3 interculturings. (ix) 25.04’. (x) 6.9.1957 to 10.11.1957.

2. TREATMENTS:
Main-plot treatments:
Sub-plot treatments:
3 doses of P2O5 as Super: P0 = 0, P1 = 30; and P2 = 60 lb./ac.
P2O5 broadcast on 29.6.1957.

3. DESIGN:
(i) Split-plot. (ii) (a) 8 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 24’ x 15’. (b) 22’ x 13’. (v) 1’ x 1’. (vi) Yes.

4. GENERAL:
(i) Not good. (ii) Nil. (iii) Legume seed. (iv) (a) 1957—60. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Due to shortage of rains the crop in plots L3, L6 and L8 failed. Expt. analysed as R.B.D.

5. RESULTS:
(i) and (ii) As below. (iii) Treatment differences are not significant. (iv) Av. yield of legumes in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L1</th>
<th>L2</th>
<th>L4</th>
<th>L5</th>
<th>L7</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>722</td>
<td>963</td>
<td>132</td>
<td>500</td>
<td>441</td>
</tr>
<tr>
<td>P1</td>
<td>801</td>
<td>1026</td>
<td>109</td>
<td>498</td>
<td>476</td>
</tr>
<tr>
<td>P2</td>
<td>862</td>
<td>1027</td>
<td>134</td>
<td>459</td>
<td>473</td>
</tr>
<tr>
<td>Mean</td>
<td>795</td>
<td>1005</td>
<td>125</td>
<td>486</td>
<td>463</td>
</tr>
<tr>
<td>S.E./plot.</td>
<td>171.2</td>
<td>243.2</td>
<td>57.6</td>
<td>128.6</td>
<td>137.1</td>
</tr>
</tbody>
</table>

Crop: Legumes (Kharif).
Crop :- Legumes (Kharif).

Site :- Soil Cons. Res. Demonstrn. and Training Centre, Vasad.  Type :- 'M'.

Object :- To study the response of cultivated legumes likely to serve as cover crops to phosphatic manuring.

1. BASAL CONDITIONS:

   (i) (a) Nil. (b) and (c) As per treatments. (ii) (a) Sandy loam to loam. (b) Refer soil analysis, Vasad. (iii) 24.6.1958. (iv) (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c)-(d) (e) 1. (v) Nil. (vi) Improved strains. (vii) Unirrigated. (viii) 2 interculturings. (ix) 42.44°. (x) 17.7.1958 to 11.10.1958.

2. TREATMENTS:

   Same as in exp. no. 57/130) on page 441.


3. DESIGN:

   (i) Split-plot. (ii) (a) 8 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 20' × 18' for replications I, II and III and 12' × 18' for replications IV, V and VI. (b) 18' × 16' for replications I, II and III and 10' × 16' for replications IV, V and VI. (v) 1' × 1'. (vi) Yes.

4. GENERAL:

   (i) Not satisfactory. (b) Virus disease of cowpea was observed. (iii) Seed and pod yield of legumes. (iv) (a) 1957—1960 (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Soyabean and chinamug in replications IV and VI were severely affected and germination failed in spite of dibbling the seeds thrice. Expt. was analysed as R.B.D. for different legumes.

5. RESULTS:

   (i) and (ii) As below. (iii) Only L₀ effect is highly significant. No other effect is significant. (iv) Av. yield of legume in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₀</th>
<th>L₁</th>
<th>L₂</th>
<th>L₃</th>
<th>L₄</th>
<th>L₅</th>
<th>L₆</th>
<th>L₇</th>
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<tbody>
<tr>
<td>P₀</td>
<td>321</td>
<td>1088</td>
<td>1463</td>
<td>77</td>
<td>260</td>
<td>237</td>
<td>944</td>
<td>651</td>
</tr>
<tr>
<td>P₁</td>
<td>319</td>
<td>1623</td>
<td>1597</td>
<td>131</td>
<td>296</td>
<td>156</td>
<td>1278</td>
<td>798</td>
</tr>
<tr>
<td>P₂</td>
<td>459</td>
<td>1669</td>
<td>1586</td>
<td>94</td>
<td>295</td>
<td>111</td>
<td>1268</td>
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<td>1460</td>
<td>1549</td>
<td>101</td>
<td>284</td>
<td>168</td>
<td>1163</td>
<td>689</td>
</tr>
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<td>248.4</td>
<td>70.78</td>
<td>136.1</td>
<td>83.08</td>
<td>247.4</td>
<td>134.7</td>
</tr>
</tbody>
</table>

---

Crop :- Legumes (Kharif).

Site :- Soil Cons. Res. Demonstrn. and Training Centre, Vasad.  Type :- 'M'.

Object :- To study the response of cultivated legumes likely to serve as cover crops to phosphatic manuring.

1. BASAL CONDITIONS:

   (i) (a) Nil. (b) and (c) As per treatments. (ii) (a) Sandy loam to loam. (b) Refer soil analysis, Vasad. (iii) 26 to 30.6.1959. (iv) (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c)-(d) (e) 1. (v) Nil. (vi) Improved strains of legumes. (vii) Unirrigated. (viii) 5 interculturings. (ix) 44.22°. (x) 2.9.1959 to 30.11.1959.

2. TREATMENTS and 3. DESIGN:

   Same as in exp. no. 58/129) above.

   Super broadcast on 28, 29.6.1959.
4. GENERAL:
(i) and (ii) N.A. (iii) Seed and pod yield of legumes. (iv) (a) 1957—1960. (b) Yes. (c) Nil. (v) (a) and (b) Nil. (vi) N.A. (vii) Experiment completely failed in 1960—1961. Expt. was analysed as R.B.D. for different legumes.

5. RESULTS:
(i) and (ii) As below. (iii) Main effects of L4, L7 and L8 are significant. No other effect is significant. (iv) Av. yield of legume in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L7</th>
<th>L8</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>148</td>
<td>1257</td>
<td>37</td>
<td>229</td>
<td>346</td>
<td>451</td>
<td>750</td>
</tr>
<tr>
<td>P1</td>
<td>145</td>
<td>1402</td>
<td>37</td>
<td>244</td>
<td>174</td>
<td>517</td>
<td>803</td>
</tr>
<tr>
<td>P2</td>
<td>223</td>
<td>1050</td>
<td>48</td>
<td>387</td>
<td>321</td>
<td>567</td>
<td>963</td>
</tr>
<tr>
<td>Mean</td>
<td>172</td>
<td>1236</td>
<td>41</td>
<td>287</td>
<td>280</td>
<td>512</td>
<td>839</td>
</tr>
<tr>
<td>S.E./plot</td>
<td>82.43</td>
<td>750</td>
<td>190.4</td>
<td>10.36</td>
<td>78.27</td>
<td>243.8</td>
<td>115.55</td>
</tr>
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</table>

Crop :- Legumes *(Kharif).*

Site :- Soil Cons. Res. Demonstn. and Training Centre, Vasad. Type :- 'M'.

Object:—To study the response of cultivated legumes likely to serve as cover crops to the application of Boron and Manganese.

1. BASAL CONDITIONS:
(i) (a) Nil. (ii) and (c) N.A. (i) (a) Sandy loam to loam. (b) Refer soil analysis, Vasad. (iii) N.A. (iv) (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c) ---. (d) 12"x12". (e) 1. (v) 60 lb./ac. of P2O5 as Super applied at sowing. (vi) Improved strains of legumes. (vii) Unirrigated. (viii) N.A. (ix) 42.44". (x) N.A.

2. TREATMENTS:
Main-plot treatments:
4 legumes: L1=Cowpea, L2=Guar, L3=Mung and L4=Moth.

Sub-plot treatments:
4 combinations of Boron and Manganese: 0=No B or Mn., B=5 lb./ac. of Boron, M=5 lb./ac. of Manganese and BM=5 lb./ac. of Boron+5 lb./ac. of Manganese.

Boron and Manganese applied at dibbling.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 24'x9'. (b) 23'x8'. (v) 6'x6'. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Legumes yield. (iv) (a) 1958—1960. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) The experiment is analysed as R.B.D. for different legumes.

5. RESULTS:
(i) and (ii) As below. (iii) For L1—Main effect of B alone is significant; for L3—Main effect of B is highly significant and interaction BM is significant; for L9 and L4—No effect or interaction is significant. (iv) Av. yield of legumes in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>443</td>
<td>544</td>
<td>484</td>
<td>189</td>
</tr>
<tr>
<td>B</td>
<td>374</td>
<td>777</td>
<td>440</td>
<td>200</td>
</tr>
<tr>
<td>M</td>
<td>540</td>
<td>592</td>
<td>404</td>
<td>174</td>
</tr>
<tr>
<td>BM</td>
<td>333</td>
<td>655</td>
<td>407</td>
<td>170</td>
</tr>
<tr>
<td>Mean</td>
<td>422</td>
<td>642</td>
<td>434</td>
<td>183</td>
</tr>
<tr>
<td>S.E./plot</td>
<td>94.46</td>
<td>71.73</td>
<td>187.3</td>
<td>40.48</td>
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</table>
Crop : Legumes (Kharif).


Object :—To study the response of cultivated legumes likely to serve as cover crops to the application of Boron and Manganese.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) and (c) As per treatments. (ii) (a) Sandy loam to loam. (b) N.A. (iii) 6.7.1959. (iv) (a) 1 ploughing and 1 harrowing. (b) Dibbling. (c) N.A. (d) 12” X 12”. (e) 1. (v) 60 lb./ac. of P₂O₅ applied at sowing. (vi) Improved strains of legumes. (vii) Unirrigated. (viii) 3 interculturings. (ix) 44.22”. (x) 22.10.1959 to 4.12.1959.

2. TREATMENTS and 3. DESIGN :
   Same as in expt. no. 58 (127) on page 443. B and M applied on 5.7.1959.

3. GENERAL :
   (i) N.A. (ii) Nil. (iii) Yield of legumes. (iv) (a) 1958—1960. (b) Yes. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) The experiment analysed as R.B.D. for different legumes.

4. RESULTS :
   (i) and (ii) As below. (iii) Main effects of M for guar and mung crop is highly significant. Interaction B X M is significant for cowpea crop. No other effect is significant. (iv) Av. yield of legume in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₁</th>
<th>L₂</th>
<th>L₃</th>
<th>L₄</th>
</tr>
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<tbody>
<tr>
<td>O</td>
<td>92</td>
<td>18</td>
<td>140</td>
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</tr>
<tr>
<td>B</td>
<td>78</td>
<td>25</td>
<td>177</td>
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</tr>
<tr>
<td>M</td>
<td>85</td>
<td>32</td>
<td>214</td>
<td>458</td>
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<tr>
<td>BM</td>
<td>111</td>
<td>28</td>
<td>196</td>
<td>573</td>
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<tr>
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<td>466</td>
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<td>S.E./plot</td>
<td>15.86</td>
<td>5.33</td>
<td>27.46</td>
<td>137.4</td>
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