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OF
AGRICULTURAL
FIELD
EXPERIMENTS

VOL. 12 PART 3

RAJASTHAN

1960—65

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FOREWORD

The I. C. A. R. has adopted the 'Co-ordinated approach' to crop improvement as its strategy in agricultural research. This approach is based on the principle of giving high priority to problem solving research and for the purpose an intimate knowledge of research in progress and trends of results is very essential. To give impetus to this approach, I. C. A. R. started a scheme for collecting data of all field experiments conducted in the country. It was aimed at compilation of agronomic experiments in the country, with a view to indicate the gaps in the knowledge and to avoid duplication. The scheme entitled: "National Index of Field Experiments" is running under the Institute of Agricultural Research Statistics which has rendered a very valuable service by preparing compendia of agricultural field experiments conducted in the country. Two series of the compendia containing results of about 7,200 and 12,000 experiments conducted during the periods 1948-53 and 1954-59, respectively have already been published by the Institute. The present is the third series of compendia and is expected to contain the results of about 18,000 experiments conducted during the period 1960-65.

The number and the types of experiments have been increasing at a fast rate. Further, many of the experiments were being repeated over a number of years. The conclusions drawn from such experiments should take into account the seasonal variations. For this purpose, it was necessary to carry out consolidated analysis of results over years. Thus the task of compilation, analysis and interpretation of results of experiments being covered in the third series became more formidable compared to those covered in the earlier two series.

The preparation of this compendium has been possible by the whole-hearted co-operation of State Departments of Agriculture, Agricultural Universities and Central Research Institutes who ungrudgingly made the results of their experimental research available. My thanks are due to various officers of these institutions for participating in this work.

I hope that the present series will be followed by periodical publications of similar compendia for later years in order that the availability of results of scientific experiments in agriculture in India may be maintained up-to-date in a consolidated form.

B. K. SONI
Deputy Director General (AS)
Indian Council of Agricultural Research

New Delhi,
January 1, 1973
time to time and provided guidance to the regional staff working in the scheme. The list of the names of the regional supervisors and regional staff of the project is given on the following pages.

NEW DELHI,
January 1, 1973

M. N. DAS
Director
Institute of Agricultural Research Statistics
(I. C. A. R.)
### Regional Supervisors and Regional Staff of the National Index of Field Experiments

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Region &amp; Headquarters</th>
<th>Statistical staff from the Institute of Agricultural Research Statistics</th>
<th>Regional Supervisor</th>
</tr>
</thead>
</table>
| 1.    | Andhra Pradesh (Hyderabad)  | 1. Shri C. H. Rao  
2. Shri G. V. S. R. Krishna  
| 2.    | Assam (Shillong)            | 1. Shri A. Sinha  
2. Shri K. D. Saha | 1. Shri U. C. Borah, Research Officer (Stat.) |
| 3.    | Bihar (Sabour)              | 1. Shri R. K. Jain  
2. Shri S. M. G. Saran | 1. Shri G. P. Singh, Statistician |
| 5.    | Kerala (Trivandrum)         | - | 1. Shri N. George John, Research Officer |
| 6.    | Madhya Pradesh (Bhopal)     | 1. Shri Rama Rao Patil  
2. Shri S. S. Kutaula | 1. Shri A. G. Khare, Dy. Director of Agriculture (Stat.) |
| 7.    | Maharashtra (Poona)         | 1. Shri P. R. Yeri  
2. Shri B. Ramakrishnan | 1. Shri V. G. Sharma, Sr. Statistician |
| 8.    | Mysore (Bangalore)          | 1. Shri K. A. Balakrishnan  
2. Shri P. T. N. Nambiar | 1. Dr. N. P. Patil, Director of Research |
<p>| 9.    | Orissa (Bhubaneswar)        | 1. Shri Rama Rao Patil | 1. Shri B. Mishra, Dy. Director of Agri. (Hq.) |
|       |                             |                                                                          | 2. Shri A. Mishra, Chief Statistician       |</p>
<table>
<thead>
<tr>
<th>Number</th>
<th>State/Region</th>
<th>Members</th>
</tr>
</thead>
</table>
| 10     | Punjab, Haryana,  | 1. Shri B. L. Kaitha
Himachal  | 2. Shri U. N. Dixit
Pradesh, Jammu & Kashmir | 3. Shri D. L. Manocha
(Ludhiana) | 4. Shri M. S. Batra
 | 5. Shri D. P. Singh |
| 11     | Rajasthan (Jaipur) | 1. Shri N. K. Ohri
 | 2. Shri C. H. Rao |
| 12     | Tamil Nadu (Coimbatore) | 1. Shri P. Narayanan
 | 2. Shri M. V. George |
| 13     | Uttar Pradesh (Lucknow) | 1. Shri S. N. Bajpai
 | 2. Shri M. P. Saksena
 | 3. Shri G. N. Bahuguna
 | 4. Shri O. P. Sharma
 | 5. Shri R. Sharma
 | 6. Shri C. B. Tiwari
 | 7. Shri R. S. Singh
 | 8. Shri A. C. Srivastava |
| 14     | West Bengal (Calcutta) | 1. Shri A. K. Mukherjee
 | 2. Shri A. Sinha |
|        |                   | 1. Shri P. S. Sahota,
                 | Director of Crop Insurance
|        |                   | 2. Shri Darshan Singh,
                 | Asstt. Statistician
|        |                   | 3. Shri M. S. Pannu,
                 | Statistician, Department of Agriculture
|        |                   | 4. Dr. D. Raghavarao,
                 | Prof. & Head. Dept. of Maths. & Stat., P.A.U., Ludhiana
|        |                   | 1. Shri H. C. Kothari,
                 | Dy. Director (Statistics), Department of Agriculture
|        |                   | 1. Shri K. R. Nagaraja Rao,
                 | Secretary, Research Council
|        |                   | 2. Dr. K. Ramakrishnan,
                 | Associate Dean
|        |                   | 3. Dr. D. Daniel Sunderaraj,
                 | Principal
|        |                   | 1. Dr. K. Kishen, Jr. Director
                 | of Agriculture (Statistics)
|        |                   | 2. Shri K. P. Avasthy,
                 | Officer-on-Special Duty
|        |                   | 1. Shri S. N. Mukherjee,
                 | Dy. Director of Agriculture (Statistics)
ABBREVIATIONS COMMON TO EXPERIMENTS ON ANNUAL AND PERENNIAL CROPS AND EXPERIMENTS ON CULTIVATORS' FIELDS GIVEN IN EXPERIMENTAL DATA

Crop:—In the top left corner, is given the name of the crop on which the experiment is conducted. Within brackets along side the crop, is mentioned the season wherever the information is available.

Ref:—Against the sub-title ‘Reference’ is mentioned the name of the State, the year in which the experiment is conducted and the serial number of the experiment for that year is given in brackets.

Abbreviations adopted for States are as follows:

1. A.P. — Andhra Pradesh
2. As. — Assam
3. Bh. — Bihar
4. Gj. — Gujarat
5. H.P. — Haryana
6. Hr. — Himachal Pradesh
7. J.K. — Jammu & Kashmir
8. K. — Kerala
9. M.P. — Madhya Pradesh
10. Mh. — Maharashtra
11. Ms. — Mysore
12. N.L. — Nagaland
13. Or. — Orissa
14. Pb. — Punjab
15. Rj. — Rajasthan
16. T.N. — Tamil Nadu
17. Tr. — Tripura
18. U.P. — Uttar Pradesh
19. W.B. — West Bengal

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

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

For Central Institutes, the corresponding standard abbreviations have been adopted as given below:

C. P. R. I. — Central Potato Research Institute.
C. R. R. I. — Central Rice Research Institute.
C. T. C. R. I. — Central Tuber Crops Research Institute.
C. T. R. L. — Cotton Technological Research Laboratory.
I. A. R. I. — Indian Agricultural Research Institute.
I. H. R. — Institute of Horticultural Research.
I. L. R. I. — Indian Lac Research Institute.
J. T. R. L. — Jute Technological Research Laboratory.
S. B. I. — Sugarcane Breeding 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. In factorial experiments, the treatments will be abbreviated as, for example, Cultural-cum-Manurial as CM.

Object:—A statement of the objective of the experiment is given indicating the main crop and the type of the experiment.

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 critical differences for individual effect means which are significant.

Other abbreviations used in the Experimental Data

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kg</td>
<td>Kilogram(s)</td>
</tr>
<tr>
<td>Kg/ha.</td>
<td>Kilogram(s) per hectare</td>
</tr>
<tr>
<td>N</td>
<td>Nitrogen</td>
</tr>
<tr>
<td>P</td>
<td>Phosphate</td>
</tr>
<tr>
<td>K</td>
<td>Potash</td>
</tr>
<tr>
<td>Nitro. Phos.</td>
<td>Nitrogen Phosphate</td>
</tr>
<tr>
<td>Ammo. Phos.</td>
<td>Ammonium Phosphate</td>
</tr>
<tr>
<td>A/S</td>
<td>Ammonium Sulphate</td>
</tr>
<tr>
<td>A/S/N</td>
<td>Ammonium Sulphate Nitratre</td>
</tr>
<tr>
<td>C/A/N</td>
<td>Calcium Ammonium Nitrate</td>
</tr>
<tr>
<td>A/N</td>
<td>Ammonium Nitrate</td>
</tr>
<tr>
<td>A/C</td>
<td>Ammonium Chloride</td>
</tr>
<tr>
<td>C/N</td>
<td>Chilean Nitrate</td>
</tr>
<tr>
<td>Mur. Pot.</td>
<td>Muriate of Potash</td>
</tr>
<tr>
<td>Pot. Sul.</td>
<td>Potassium Sulphate</td>
</tr>
<tr>
<td>Super.</td>
<td>Super Phosphate</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dical. Phos.</td>
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<tr>
<td></td>
<td>Zn. Sul.</td>
</tr>
<tr>
<td></td>
<td>Cu. Sul.</td>
</tr>
<tr>
<td></td>
<td>Mg. Sul.</td>
</tr>
<tr>
<td></td>
<td>Mn. Sul.</td>
</tr>
<tr>
<td></td>
<td>Ammo. Molybdate</td>
</tr>
<tr>
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<td>B.</td>
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<tr>
<td></td>
<td>Fe. Sul.</td>
</tr>
<tr>
<td></td>
<td>F. M.</td>
</tr>
<tr>
<td></td>
<td>G. N. C.</td>
</tr>
<tr>
<td></td>
<td>M. C.</td>
</tr>
<tr>
<td></td>
<td>T. C.</td>
</tr>
<tr>
<td></td>
<td>G. M.</td>
</tr>
<tr>
<td></td>
<td>G. L. M.</td>
</tr>
<tr>
<td></td>
<td>F. Y. M.</td>
</tr>
<tr>
<td></td>
<td>C. M.</td>
</tr>
</tbody>
</table>

The information regarding the particulars of research stations may be obtained under the respective items as given below:

**PARTICULARS OF RESEARCH 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 fortnightly rainfall, specifying the period on which the figures are based.

C. Irrigation and Drainage facilities:

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

D. Soil type and Soil analysis:

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

F. 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 under experimental data as given on next page:
**BASEL CONDITIONS**

A. For experiments on annual crops:

(i) (a) Crop rotation followed, if any. (b) Previous crop. (c) Manuring of previous crop (State amount and kind). (ii) Soil type. (iii) Date of sowing/planting. (iv) Cultural practices: (a) Preparatory cultivation. (b) Method of sowing. (c) Seed rate. (d) Spacing. (e) No. of seedlings per hole. (v) Basal manuring given to the whole experiment with time and method of application. (vi) Variety (indicate also early, medium or late). (vii) Irrigated or un-irrigated. (viii) Important post-sowing/planting cultural operations such as weeding, etc. (ix) Rainfall during crop season. (x) Date of harvest.

B. For experiments on perennial crops:

(i) Previous history of the experimental area (Give manuring and other operations). (ii) Soil type. (iii) Method of propagation of plants. (iv) Variety. (v) Date and method of sowing/planting (including spacing). (vi) Age of seedlings at the time of planting. (vii) Basal manuring given to the whole experimental area. (viii) Important cultural operations during the experimental year. (ix) Inter-cropping, if any. (x) Irrigated or un-irrigated (If irrigated, give the source, number, interval and intensity of irrigation). (xi) Rainfall during the experimental year. (xii) Date(s) of harvest.

C. For experiments on cultivators fields:

(i) (a) Crop rotation followed, if any. (b) Previous crop. (c) Manuring of previous crop (State amount and kind). (ii) Soil type and soil analysis, if available. (iii) Basal manuring (Give 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) Date of sowing/planting. (vii) Irrigated or un-irrigated. (viii) Important post-sowing/planting cultural operations during crop season. (ix) Rainfall during crop season. (x) Date of harvest.

**DESIGN**

A. For experiments on annual crops:

(i) Abbreviations for designs: C. R. D.—Completely Randomised Design; R. B. D.—Randomised Block Design; L. Sq.—Latin Square; Fact.—Factorial; Confd.—Confounded; other designs and modifications of the above to be indicated in full. (indicate confounded effects, if any). (ii) (a) No. of plots per block (in a split-plot experiment, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given). (b) Block dimensions. (iii) No. of replications. (iv) (a) Gross plot-size. (b) Net plot-size. (v) Border or guard rows kept. (vi) Whether treatments are randomised (independently 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; Fact.—Factorial; Confd.—Confounded; other designs and modifications of the above to be indicated in full. (indicate confounded effects, if any) (ii) (a) No. of plots per block (in split-plot experiments, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given). (b) Block dimensions. (iii) No. of replications. (iv) (a) Gross plot-size. (b) Net plot-size. (v) Border or guard rows kept. (vi) Whether treatments are randomised (independently in each block).

C. For experiments on cultivators fields:

(i) Design with No. of plots/block and No. of replications. (In split-plot experiments, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given.) (ii) Method of selection of sites with number and distribution of experiments. (iii) (a) Gross plot-size. (b) Net plot-size. (iv) Whether treatments are randomised (independently in each block).
BASAL CONDITIONS

A. For experiments on annual crops:

(i) (a) Crop rotation followed, if any. (b) Previous crop. (c) Manuring of previous crop (state amount and kind). (ii) Soil type. (iii) Date of sowing/planting. (iv) Cultural practices: (a) Preparatory cultivation. (b) Method of sowing. (c) Seed rate. (d) Spacing. (e) No. of seedlings per hole. (v) Basal manuring given to the whole experiment with time and method of application. (vi) Variety (indicate also early, medium or late). (vii) Irrigated or un-irrigated. (viii) Important post-sowing/planting cultural operations such as weeding, etc. (ix) Rainfall during crop season. (x) Date of harvest.

B. For experiments on perennial crops:

(i) Previous history of the experimental area (Give manuring and other operations). (ii) Soil type. (iii) Method of propagation of plants. (iv) Variety. (v) Date and method of sowing/planting (including spacing). (vi) Age of seedlings at the time of planting. (vii) Basal manuring given to the whole experimental area. (viii) Important cultural operations during the experimental year. (ix) Inter-cropping, if any. (x) Irrigated or un-irrigated (If irrigated, give the source, number, interval and intensity of irrigation). (xi) Rainfall during the experimental year. (xii) Date(s) of harvest.

C. For experiments on cultivators’ fields:

(i) (a) Crop rotation followed, if any. (b) Previous crop. (c) Manuring of previous crop (state amount and kind). (ii) Soil type and soil analysis, if available. (iii) Basal manuring (Give 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) Date of sowing/planting. (vii) Irrigated or un-irrigated. (viii) Important post-sowing/planting cultural operations such as weeding, etc. (ix) Rainfall during crop season. (x) Date of harvest.

DESIGN

A. For experiments on annual crops:

(i) Abbreviations for designs: C. R. D.—Completely Randomised Design; R. B. D.—Randomised Block Design; L. Sq.—Latin Square; Fact.—Factorial; Conf’d.—Confounded; other designs and modifications of the above to be indicated in full. (indicate confounded effects, if any). (ii) (a) No. of plots per block (in a split-plot experiment, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given). (b) Block dimensions. (iii) No. of replications. (iv) (a) Gross plot-size. (b) Net plot-size. (v) Border or guard rows kept. (vi) Whether treatments are randomised (independently 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; Fact.—Factorial; Conf’d.—Confounded; other designs and modifications of the above to be indicated in full. (indicate confounded effects, if any) (ii) (a) No. of plots per block (in split-plot experiments, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given). (b) Block dimensions. (iii) No. of replications. (iv) (a) Net plot-size. (b) No. of trees per plot (In case of experiments on grasses give plot-size). (v) Border or guardrows kept. (vi) Whether treatments are randomised (independently in each block).

C. For experiments on cultivators’ fields:

(i) Design with No. of plots/block and No. of replications. (In split-plot experiments, the number of main-plots per replication as well as the number of sub-plots per main-plot should be given.) (ii) Method of selection of sites with number and distribution of experiments. (iii) (a) Gross plot-size. (b) Net plot-size. (iv) Whether treatments are randomised (independently in each block).
GENERAL INFORMATION

A. For experiments on annual crops:

(i) General crop condition during growth (if lodged, state date of lodging). (ii) Incidence of pests and diseases and control measures taken, if any. (iii) Type of quantitative observations taken. (iv) (a) If the experiment has continued for more than one year, indicate year of commencement and year of termination. (b) Whether treatments assigned to the same plots every year. (c) Reference to combined analysis, if any. (v) Other centres, if any, where the same experiment has been conducted with reference numbers. (vi) Abnormal occurrences such as heavy rains, frost, storm, drought, etc. (vii) Any other important information.

B. For experiments on perennial crops:

(i) General crop condition during growth. (ii) Incidence of pests and diseases and control measures taken, if any. (iii) Type of quantitative observations taken. (iv) If the experiment has continued for more than one year, indicate year of commencement and year of termination (Give reference of previous years, if any). (v) Other centres, if any, where the same experiment has been conducted with reference numbers. (vi) Reference to combined analysis, if any. (vii) Abnormal occurrences such as heavy rains, frost, storm, drought, etc. (viii) Any other important information.

C. For experiments on cultivators' fields:

(i) General crop condition during growth. (ii) Incidence of pests and diseases and control measures taken, if any. (iii) Type of quantitative observations taken. (iv) In case of repetition in successive years, (a) Year of commencement and termination. (b) Whether treatments assigned to the same plots every year. (c) Reference to combined analysis, if any. (v) In case of repetition at other places, give names with references, if any. (vi) Abnormal occurrences such as heavy rains, drought, etc. (viii) Any other important information.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of Crop</th>
<th>Botanical Name</th>
<th>Assamese</th>
<th>Bengali</th>
<th>Oriya</th>
<th>Telugu</th>
<th>Tamil</th>
<th>Malyalam</th>
<th>Kannada</th>
<th>Marathi</th>
<th>Gujarati</th>
<th>Hindi</th>
<th>Punjabi</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paddy</td>
<td><em>Oryza sativa</em> L.</td>
<td>Dhan</td>
<td>Dhan</td>
<td>Vadlu</td>
<td>Neel</td>
<td>Neltu</td>
<td>Bhatta</td>
<td>Bhat</td>
<td>Dangar</td>
<td>Dhan</td>
<td>Chaul</td>
<td>Dhan</td>
</tr>
<tr>
<td>2</td>
<td>Wheat</td>
<td><em>Triticum sativum</em> Lamk.</td>
<td>Gaum, Ghehu</td>
<td>Gaum</td>
<td>Godumalu</td>
<td>Kothumai</td>
<td>Gothambo</td>
<td>Godhi</td>
<td>Gahu</td>
<td>Gahu</td>
<td>Gehon</td>
<td>Kanak</td>
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<tr>
<td>3</td>
<td>Barley</td>
<td><em>Hordeum vulgare</em> L.</td>
<td>Jak'dhan</td>
<td>Joba, Berli or Jabadhana</td>
<td>Barley</td>
<td>Baari arii</td>
<td>Barley akki</td>
<td>Satu</td>
<td>Jav</td>
<td>Jau</td>
<td>Jauh</td>
<td>Jauh</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Jowar</td>
<td><em>Andropogon sorgiwhum</em> Brot.</td>
<td>—</td>
<td>Jowar</td>
<td>Jonna</td>
<td>Cholam</td>
<td>Cholam</td>
<td>Jola</td>
<td>Jowari</td>
<td>Jowari</td>
<td>Jowar</td>
<td>Jowar</td>
<td>Jowar</td>
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<tr>
<td>5</td>
<td>Bajra</td>
<td><em>Pennisetum typhoides</em> Stapf Ex Hubbard; <em>Pennisetum typhoidum</em> L.</td>
<td>—</td>
<td>Bajra</td>
<td>Sajja</td>
<td>Kambu</td>
<td>Kambu</td>
<td>Sajje</td>
<td>Bajri</td>
<td>Bajri</td>
<td>Bajra</td>
<td>Bajra</td>
<td>Bajra</td>
</tr>
<tr>
<td>6</td>
<td>Maize</td>
<td><em>Zea mays</em> L.</td>
<td>Gom dhan</td>
<td>Bhutta</td>
<td>Macca</td>
<td>Makka-cholam</td>
<td>Cholam</td>
<td>Cholam</td>
<td>Jola</td>
<td>Jowari</td>
<td>Jowari</td>
<td>Jowar</td>
<td>Jowar</td>
</tr>
<tr>
<td>7</td>
<td>Gram</td>
<td><em>Cicer arietinum</em> L.</td>
<td>Butmah</td>
<td>Chola</td>
<td>Boot</td>
<td>Sanagalu</td>
<td>Kadali, Sundial</td>
<td>Kadali</td>
<td>Kadale</td>
<td>Harbara</td>
<td>Chana</td>
<td>Chana</td>
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</tr>
<tr>
<td>8</td>
<td>Moth</td>
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The general information regarding the agro-climatic regions, extent of irrigation, normal cropping pattern, etc, of the State of Rajasthan has been given in the first and second parts of the National Index of Agricultural Field Experiments already published for the periods 1948-53 and 1954-59 respectively.

This volume includes the results of 543 experiments conducted during the period 1960-65, besides experiments belonging to All-India Co-coordinated Agronomic Experiments scheme of I.C.A.R., as against 259 experiments for the period 1954-59 and 116 experiments for the period 1948-53. The consolidated results of experiments conducted for more than one year and concluded during the period 1960-65, numbering 279 and forming 119 groups, have been presented, the details of which are given in Table 1 below:

**Table 1.**

Number of groups and experiments conducted during the period 1960—65 (Crop-wise and Type-wise).

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Total: 50(118) 8(19) 19(45) 2(4) 7(16) 2(4) 1(2) 5(10) 2(6) 1(3) 21(48) 2(4) 119(279)

N.B.: Figures in the brackets indicate total number of experiments in the groups.
The results of experiments conducted for only one year during the period under report and also those of the experiments which are continued beyond 1965, numbering 264, have been presented. The distribution of all experiments, according to crop and type of treatments, is furnished in Table 2 below:

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The principal crops of the State are Bajra, Gram and other pulses. Jowar, Wheat, Maize and Barley are the other important cereal crops. Among the oilseed crops, Sesamum, Rape and Mustard, Groundnut, Linseed and Castor are grown. Cotton, Paddy, Sugarcane, Tobacco and Potato are also grown in some parts of the State, but these occupy relatively small areas. The salient features of experimentation on different crops are given below:

Paddy: Paddy covers 106.1 thousand hectares i.e. 0.68% of the total cropped area. 26 experiments were reported on this crop, of which 24 were conducted under irrigated conditions. 14 experiments forming 5 groups were concluded during the period under report. M and C types of experiments accounted for 8 and 6 experiments respectively while 3 experiments each were of CV, CM and ICV types and 1 experiment each was of MV, IC and ICM types. In the manurial experiments, the levels of Nitrogen, Phosphate and Potash ranged between 0 and 90 Kg/ha. Different forms of Nitrogen and times of application of Nitrogen as a factor were also tried in these experiments. In cultural experiments, dates of transplanting, spacings, age of seedlings, number of seedlings per hole, methods of sowing and seedrates were tried as factors. 18 experiments were laid out in Split-plot Design, 6 in Confounded Factorial Designs and the remaining 2 in Randomised Block Design. In Split-plot Design, 3 and 4 replications were used in 9 experiments each. The Confounded Factorial Designs and Randomised Block Design experiments were laid out with 2 and 4 replications respectively. In the M, C, CM, IC and ICM types of experiments N.P.130 and T. 21 varieties were mainly used.

Wheat: Wheat occupies 1183.4 thousand hectares i.e. 7.63% of the total cropped area. 159 experiments were reported on Wheat crop, of which 142 experiments were conducted under irrigated conditions. 83 experiments forming 36 groups were concluded during the period under report. M, D, G and MV types accounted for 71, 39, 30 and 8 experiments respectively. 3 experiments each of CMV and IM, 2 experiments each of I and IMV and one experiment of ICM types were also conducted. In the manurial types of experiments, levels of Nitrogen ranged between 0 and 200 Kg/ha and that of Phosphate and Potash between 0 and 148 Kg/ha. Sources of Nitrogen, time and methods of application of Nitrogen and Phosphate, different doses of trace-elements, Gypsum, F.Y.M., Spartina and green manures were the other factors tried in these experiments. In C, CMV and ICM types of experiments, seedrates were tried in the majority of experiments followed by sowing dates and row-spacings. Numbers and stages of weeding, various types of mulch, methods of cultivation and direction of rows were the other factors tried in these experiments. Efficiency of seed-dressing by different fungicides, economics of controlling weeds by weedicides and other methods and effect of different chemicals in the control of Wheat rusts were the objectives studied in D type experiments. Different frequencies, intensities and stages and methods of application of irrigation were tried as factors in I, IM, IMV and ICM types of experiments. 79, 55, 17, 4, 3 and 1 experiments were conducted in Randomised Block Design, Split-plot Design, Confounded Factorial Designs, Incomplete Latin Square Design, Fractional Replication and Split-plot Con-

Barley: 27 experiments were reported on this crop, of which all except one were conducted under irrigated conditions. 14 experiments forming 6 groups were concluded during the period under report. 8 experiments each were of M and D types while 5, 3, 2 and 1 experiments were of MV, C, CV and IM types. In the manurial types of experiments, levels of Nitrogen ranged between 0 and 100 Kg/ha, while that of Phosphate and Potash between

0 and 67 Kg/ha. Forms of Nitrogen and trace-elements were the other factors tried in these experiments. In C and CV types, sowing dates and seed rates were the factors tried. Out of the eight D type experiments, 2 were for controlling weeds in the crop and the remaining were to test the efficacy of different fungicides as seed-dressing. 10, 9, 7 and 1 experiments were conducted in Confounded Factorial Designs, Randomised Block Design, Split-plot Design and Incomplete Latin Square Design respectively. Out of 7 experiments with Split-plot Design, 4 were conducted with 4 replications and the rest with 2 replications. 5, 1 and 3 experiments with Randomised Block Design had 6, 4 and 3 replications respectively. 7 Confounded experiments had 2 replications while 3 were unreplicated. Except in MV and CV types of experiments, all the others were conducted with R.S.-17 variety of Barley.

**Jowar** :- Jowar covers 1194.6* thousand hectares i.e. 7.71% of the total cropped area. Considering the area of this crop in the State, a few experiments have been reported on this crop. 5 and 4 experiments belonged to M and D types while 2 and 1 experiments were of C and CMV types respectively. Out of these, 9 were conducted under rain-fed conditions. Only one experiment was repeated for two years during the period. In four M and CMV types of experiments, levels of Nitrogen, Phosphate and Potash were tried and these ranged between 0 to 112 Kg/ha, 0 to 67 Kg/ha, and 0 to 56 Kg/ha respectively. In the remaining two manurial experiments, trace-elements were tried as treatments. Four D type experiments were conducted to control weeds in the crop. In three experiments of C and CMV types, seed-rates and row-spacings were tried as factors. Confounded Factorial Designs, Randomised Block Design, Split-plot Design and Strip-plot Design were used in 2, 7, 2 and 1 experiments respectively. Confounded Factorial Designs had 2 replications while in the case of Randomised Block Design, replications ranged between 2 to 8. Experiments with Split-plot Design had 4 and 8 replications while Strip-cum-Split-plot Design had 4 replications. Seven experiments were conducted with R.S.-1 as the variety of Jowar.

**Bajra** :- Bajra covers 4852.8* thousand hectares i.e. 51.31% of the total cropped area. Among the food-crops, Bajra covers the maximum area in the State, but only 58 experiments were reported on this crop, of which 44 formed 18 groups. 24 experiments of M type, 22 experiments of D type and 4 experiments each of MV, C and CM types were conducted. 56 experiments were conducted under rain-fed conditions. In the manurial experiments, levels of Nitrogen and Phosphate ranged between 0 and 34 Kg/ha and that of Potash between 9 and 17 Kg/ha. Sources of Nitrogen and methods of application of fertilizers were the other factors tried in these experiments. Seed-rates and row-spacings were the factors tried in C and CM types of experiments. In D type, 16 and 6 experiments accounted for the methods for controlling weeds and diseases respectively. 36, 15, 3, 3 and 1 experiments were laid out in Randomised Block Design, Split-plot Design, Strip-plot Design, Confounded Factorial Designs and Incomplete Latin Square Design respectively. 3, 4 and 6 replications were used in 11, 21 and 4 experiments with Randomised Block Design. 4, 5, and 1 Split-plot experiments were laid out with 2, 3, 4 and 6 replications respectively. Experiments with Confounded Factorial Designs and Strip-plot Design had 3 replications. In M, C, CM and D types, R.S.K., R.S.J. and Local varieties of Bajra were mainly used.

**Maize** :- Maize occupies 709.4* thousand hectares i.e. 4.58% of the total cropped area. 44 experiments were reported on this crop, of which M, D, CM and C types accounted for 24, 17, 2 and 1 experiments respectively. 24 of these experiments constituted 9 groups during the period under report. 25 experiments were conducted under irrigated and the remaining 19 under rain-fed conditions. In M and CM types, levels of Nitrogen ranged between 0 and 247 Kg/ha while that of Phosphate and Potash between 0 and 100 Kg/ha. Forms of N, methods of application of fertilizers and row-spacings were the other factors tried in these experiments. 4 experiments were conducted with trace-elements as treatments. 13 of the D type experiments were for controlling weeds in the crop and the remaining 4 were to study the effect of fungicides as seed-dressing. 27, 8, 4, 3, 1 and 1 experiments were laid with
Randomised Block Design, Confounded Factorial Designs, Split-plot Design, Strip-plot Design, Latin Square Design and Incomplete Latin Square Design respectively. Replications ranged between 2 and 6 in the case of Randomised Block Design and 1 to 3 in the case of Confounded Factorial Designs. 3 Split-plot experiments were conducted with 4 replications while 1 experiment had 2 replications. Strip-plot experiments had 3 replications. Bassi (Selected) and Milan varieties were used in 29 and 10 experiments. Local variety and Hybrids were used in the remaining experiments.

**Pulse Crops:** Pulses occupy 3228.3* thousand hectares i.e. 20.83% of the total cropped area. 23, 20, 15, 7 and 4 experiments were reported on Pea, Gram, Moong, Urd and Guar crops respectively. 1 experiment each on Moth and Cowpea crops, conducted under un-irrigated conditions, were also reported. 22, 13, 5, 1 and 1 experiments on Pea, Gram, Urd, Guar and Moong respectively were conducted under irrigated conditions. Majority of the experiments were of D type, of which 13 were on Moong, 3 on Guar and 6 each were on Urd and Pea crops. 7 experiments on Gram, 3 on Pea and 1 each on Urd and Guar were of M type while 3 on Gram and 7 on Pea were of 1M and 1MV types. 7 experiments each on Gram and Pea and 1 each on Moth, Moong and Cowpea accounted for C, CV, CM and CMV types. 3 experiments on Gram and 1 on Moong were of MV type.

On Gram crop, levels of Nitrogen, Phosphate and Potash ranged between 0 and 37 Kg/ha., 0 and 74 Kg/ha. and 0 and 67 Kg/ha. respectively. Methods of application of fertilizers, trace-elements, sowing dates, effect of topping and levels of irrigations were the other factors tried. In majority of the experiments R.S.-10 variety of Gram was used. Split-plot and Confounded Factorial Designs were used in 15 and 3 experiments. 1 experiment each in Randomised Block Design and Balanced Incomplete Block Design was conducted.

On Moong crop, 13 experiments of D type were conducted to study the effect of seed-dressing of fungicides. In MV and CM types, levels of Nitrogen and Phosphate and row-spacings were the other factors tried. R.S.-4 and Local varieties were used in equal number of experiments. 8, 6, and 1 experiments were conducted in Randomised Block, Incomplete Latin Square and Split-plot Designs respectively.

Out of the six D type experiments conducted on Urd crop, 5 were to study the effect of seed-dressing of fungicides. Local variety of Urd was used in the experiments. 4, 2 and 1 experiments were conducted in Randomised Block, Split-plot and Incomplete Latin Square Designs respectively.

In manurial experiments conducted on Pea crop, levels of Nitrogen, Phosphate and Potash ranged between 0 and 34 Kg/ha., 0 and 90 Kg/ha. and 0 and 67 Kg/ha. respectively. In cultural experiments, different isolates of Rhizobia, mulching materials and row-spacings were tried as factors. In the six D type experiments, fungicides for the control of powdery mildew of Pea were tried. N.P. 29 and Bonevilla varieties were used in majority of the experiments. Randomised Block, Split-plot and Youden Square Designs were used in 10, 10 and 3 experiments respectively.

In the manurial experiment conducted on Guar crop, besides the quantities of green matter added, levels of Nitrogen ranging between 0 and 34 Kg/ha. and levels of Phosphate ranging between 0 and 67 Kg/ha. were tried. In the D type experiments, different fungicides were used to control blight and powdery mildew diseases of Guar. 3 experiments with Local variety and 1 with C. 591 variety were conducted. Incomplete Latin Square Design was used in 2 experiments while Confounded Factorial and Randomised Block Designs were used in 1 experiment each.
Vegetable Crops:—11 experiments on vegetable crops were reported and all were conducted under irrigated conditions. 7 and 2 experiments on Potato accounted for M and D types respectively while M type on Carrot and D type on Brinjal were conducted. On Potato crop, levels of Nitrogen ranged between 0 and 1:4 Kg/ha. while levels of Phosphate and Potash ranged between 0 and 100 Kg/ha. Levels of Nitrogen and Phosphate ranged between 0 and 45 Kg/ha. and 0 and 101 Kg/ha. respectively in the case of Carrot crop. Sources of Nitrogen as a factor was also tried on Potato crop. In D type experiments, effect of insecticides were studied for controlling pests and virus. Seven experiments in Randomised Block Design were laid with 4 replications while 1 had 3 replications. One experiment each with Split-plot Design had 2 and 3 replications. The only Confounded Design experiment had 2 replications.

Sugar cane:—Sugar cane occupies 42.9* thousand hectares i.e. 0.28% of the total cropped area. 24 experiments, all under irrigated conditions, were reported on this crop. Out of these, 15 experiments formed 7 groups during the period under report. 8, 6, 3 and 2 experiments respectively were of IM, CM, D and M types. One experiment each was of MV, CV, IMV, IC and ICM types. In all the manurial types of experiments (M, MV, CM, IM, IMV and ICM), levels of Nitrogen were tried and these ranged between 0 and 224 Kg/ha. Of these, 2 with Phosphate and 1 with Potash had levels between 0 and 112 Kg/ha. In cultural types of experiments (CV, CM, IC and ICM), methods and period of planting and row-spacings as factors were tried. Times of application of weedicide with and without weedings were tried in three D type experiments. Co. 419 and Co. 312 were the main varieties used. 1, 15 and 4 experiments conducted in Split-plot Design were with 4, 3 and 2 replications respectively. 1 experiment each in Randomised Block Design had 3 and 4 replications. The two Confounded Factorial Design experiments were unreplicated.

Cotton:—Cotton occupies 261.1* thousand hectares i.e. 1.68% of the total cropped area. 13 experiments, conducted under irrigated conditions, were reported on this crop. Of these, 12 experiments formed 5 groups during the period under report. 9 experiments were of M type and 2 each were of MV and CV types. In M and MV types of experiments, levels of Nitrogen Phosphate and Potash ranged between 0 and 101 Kg/ha., 0 and 67 Kg/ha. and 0 and 90 Kg/ha. respectively. Besides different varieties, sowing dates were tried in the 2 CV type experiments. In 8 of the M type experiments, 320-P, an American variety, was used. 6 and 4 experiments conducted in Randomised Block and Split-plot Designs respectively had 4 replications. The 3 Confounded Factorial experiments had 4 replications each.

Tobacco:—Tobacco occupies 9.2* thousand hectares i.e. 0.06% of the total cropped area. Only one D type experiment to control orobanche by sprays of chemical was reported on this crop.

Groundnut:—Groundnut covers 197.9* thousand hectares i.e. 1.23% of the total cropped area. 26 experiments were reported on this crop, of which 6 experiments formed 3 groups during the period under report. Half of the experiments were of D type and the remaining 7, 3, 2 and 1 accounted for M, C, ICM and CM types. 15 experiments were conducted under rain-fed conditions. In M, CM and ICM types of experiments, levels of Nitrogen and Phosphate ranged between 0 and 74 Kg/ha. and those of Potash between 0 and 34 Kg/ha. Sources of Nitrogen, time and methods of application of Phosphate and doses of Sulphur and Molybdenum were the other factors tried. In C, CM and ICM types of experiments, sowing dates, methods of sowing and earthing, row and plant spacings and seed-rates were the factors tried. In all the D type experiments, effect of fungicides as seed-dressing was studied. Among the varieties, R.S.-1 and Local were mainly used. 7 and 5 experiments in Split-plot Design were conducted with 4 and 3 replications respectively. 3, 4 and 6 replications respectively were used in 2, 1 and 4 experiments laid with Randomised Block Design. The two Confounded Factorial experiments had 2 replications each. Three experiments in Split-plot with Lattice arrangements had 3 replications while 1 Split-plot Confounded experiment was unreplicated. 1 experiment was conducted in Incomplete Latin Square Design.
Rape and Mustard: —Rape and Mustard occupies 207.8* thousand hectares i.e. 1.34% of the total cropped area. 19 experiments were reported on Mustard, of which 8 experiments formed 4 groups during the period under report. 18 experiments were conducted under irrigated conditions. 11 experiments were of M type, 4 of IM type and 1 experiment each was of MV, C, CM and D types. In M, MV, CM and IM types, levels of Nitrogen, Phosphorus and Potash ranged between 0 and 101 Kg/ha., 0 and 74 Kg/ha. and 0 and 60 Kg/ha. respectively. Sources of N and Methods of application of fertilizers were the other factors tried. In C and CM types of experiments, sowing dates, row-spacings and seed-rates were the factors tried. In the only D type experiment, effectiveness of insecticides in the control of pests was studied. Among the varieties, L-18 and R.L-18 were used in 7 and 5 experiments respectively while Local, R.L-13, Z-18 and R.L-17 were the other varieties used. 2, 3 and 4 replications were used in 2, 7 and 5 Split-plot Design experiments respectively while 1 and 4 experiments in Randomised Block Design had 2 and 4 replications.

Linseed:—Linseed occupies 90.1* thousand hectares i.e. 0.58% of the total cropped area. 13 experiments were reported on this crop, of which 9 experiments formed 4 groups during the period under report. 6 experiments were conducted under irrigated and the remaining under rain-fed conditions. 7 experiments were of M type while 3 each were of C and IMV types. In the M and IMV types of experiments, levels of Nitrogen, Phosphorus and Potash ranged between 0 and 67 Kg/ha. Time and methods of application of fertilizers, sources of Nitrogen and trace-elements were the other factors tried in these experiments. In cultural experiments, seed-rates and row-spacings were the factors tried. In M and C types of experiments, R.R-45 and Local varieties were used in 7 and 3 experiments. 2, 3 and 4 replications were used in 3, 2 and 4 experiments respectively conducted with Split-plot Design. 2 experiments each, laid in Randomised Block Design, had 3 and 4 replications.

Other Oilseeds:—2 experiments each on Til, Castor and Rai crops were reported. Considering the area of Til, which was 578.6* thousand hectares i.e. 3.73% of the total cropped area of the State, experimentation on this crop was negligible. While experiments on Castor and Rai were conducted under irrigated conditions, those on Til were under rain-fed conditions. The two MV type of experiments on Rai formed a group and besides the varieties, levels of Nitrogen and Phosphorus ranging between 0 and 101 Kg/ha. and 0 and 67 Kg/ha. respectively were tried. In the CV type experiment on Til, besides the 2 varieties, seed-rates and row-spacings were tried as factors while in the CM type experiment on Castor, plant-spacings and levels of Nitrogen, Phosphorus and Potash ranging between 0 and 37 Kg/ha. were tried. Fungicidal and insecticidal treatments were used to control Til blight and Castor hairy caterpillar. In each of the D type experiment on Til and Castor crops. Split-plot Design, Randomised Block Design and Incomplete Latin Square Design were used in 4, 1 and 1 experiments respectively.

Spices:—5 experiments on Cumin, 4 on Corriander and 2 experiments on Chilliies were reported. 3 experiments conducted on Cumin formed a group during the period under report. All the 4 cultural and 1 manural experiments on Cumin and 1 manural and 1 D type experiment on Chilliies were conducted under irrigated conditions, while 2 experiments on Corriander were conducted under rain-fed conditions. While Local varieties were used in all the experiments on Corriander and Chilliies, Local, S-401 and K-1 varieties of Cumin were used in 2, 2 and 1 experiments respectively. In the C type experiments on Cumin, dates and methods of sowing and seed-rates as factors were tried. In the manural experiment on Cumin, besides the method of application of fertilizers, levels of Nitrogen, Phosphorus and Potash were tried and these ranged between 0 and 100 Kg/ha. In the CM and ICM types of experiments on Corriander, besides the factors of dates of sowing, seed-rates and levels of irrigation tried, levels of Nitrogen, Phosphorus and Potash ranged between 0 and 67 Kg/ha. While in the M type experiment on Chilliies, levels of Nitrogen ranged between 0 and 99 Kg/ha. and that of Phosphorus and Potash between 0 and 74 Kg/ha., in the D type experiment different fungicides were used for the control of die-back and fruit-rot diseases of Chilliies. Eight experiments were conducted in Split-plot Design and 1 each in Confounded Factorial Design, Split-plot Confounded Design and Randomised Block Design.
Fodder Crops:—7 experiments on fodder crops were reported, of which 6 experiments formed 2 groups during the period under report. All the experiments were conducted under irrigated conditions. M and CM types accounted for 3 and 4 experiments respectively. In the CM type experiments, for obtaining maximum fodder yields, mixture of Jowar and Guar crops were tried in different ratio of seed rates with levels of Nitrogen ranging between 0 and 74 Kg/ha. In the M type experiments, Berseem and Senji crops were used and levels of Nitrogen and Potash ranged between 0 and 45 Kg/ha, while that of Phosphate between 0 and 125 Kg/ha. Split-plot Design with 4 replications was used in 4 experiments and Split-plot Confounded Design with 2 replications in 3 experiments.

Opium:—7 experiments were reported on Opium crop, of which 4 experiments formed 2 groups during the period under report. All the experiments were conducted under irrigated conditions. 3 experiments were of D type and 2 each were of M and C types. In the manurial experiments, besides the split application of Nitrogen, levels of Nitrogen, Phosphate and Potash ranging between 0 and 112 Kg/ha., 0 and 67 Kg/ha. and 0 and 67 Kg/ha. respectively were tried. Sowing dates and row and plant spacings as factors were tried in the cultural experiments. In the D type experiments, study of chemical control of powdery mildew disease of opium was made. 4, 2 and 1 experiments were conducted in Split-plot Design, Randomised Block Design and Balanced Incomplete Block Design respectively.

Mixed Cropping:—8 experiments, all conducted under rain-fed conditions, were reported on mixed crops. 4 experiments constituted 2 groups during the period under report. 5 experiments with Bajra and Pulses (Cowpea, Guar, Moong and Moth), 2 with Wheat and Gram and 1 with Cotton and Moth were conducted. Experiments with mixtures of Bajra and Pulses and Wheat and Gram were conducted to study the economics of mixed cropping while the experiment with Cotton and Moth was conducted to study the beneficial effect of Moth in the control of root-rot disease of Cotton. All the experiments were conducted in Randomised Block Design and 5, 2 and 1 experiments had 4, 8 and 12 replications respectively.
PARTICULARS OF RESEARCH STATIONS AND SOIL ANALYSIS

1. Government Agriculture Farm, Banswara.
   
   A. General Information:
      
      (i) Situated at Borwat in Banswara district; 80 Km. from Ratlam R.S.; The land is of even topography, upto 2% slope with normal relief; bears erosion barriers.  
      (ii) N.A.  
      (iii) 1963.  
      (v) Research Programme on Rice, Cotton, Maize and Wheat carried out.

   B. Normal Rainfall:
      
      Average annual rainfall is 111-3 cm. (92.2 cm. in Monsoon).
      
      (The period on which the figures are based is not available).

   C. Irrigation and Drainage facilities:
      
      (i) (a) and (b) Irrigation available from well and perennial nallah. Irrigational facilities available for carrying out research programmes during Kharif and Rabi.  
      (ii) Proper drainage system exists.

   D. Soil type and Soil analysis:
      
      (i) The soil of the farm lies in the deep medium black soil as classified in broad soil gr. of Rajasthan, having mixed red and black character. The soils are clay to clay loam in texture and angular bulky in structure, moderately drained deep soils. Possess sufficient moisture below 5 cm. depth.  
      (ii) Chemical analysis and  
      (iii) Mechanical analysis : N.A.

   E. No. of Experiments:
      
      Paddy—1, Wheat—2, Maize—2, Pea—1, Groundnut—1, and Til—1. Total =8.

2. Government Agricultural Experimental Farm, Bassi.

   A. General Information:
      
      (i) In Jaipur district; 1-6 Km. from Bassi R.S.; Plain area.  
      (ii) N.A.  
      (iii) 1947.  
      (iv) Barley-Bajra-Wheat.  
      (v) N.A.

   B. Normal Rainfall:
      
      June to Sept.  
      Oct. to May  
      Total

      48.5  
      4.8  
      53.3

      (Av. rainfall in cm.; based on the data for the period 1960-65).

   C. Irrigation and Drainage facilities:
      
      (i) (a) Yes, since establishment. (b) Irrigation done from well. (ii) Proper drainage system exists.

   D. Soil type and Soil analysis:
      
      (i) Sandy loam soil having red and yellow mixed colour. (ii) Chemical analysis : O.C.—0.45%; pH—8.12; E.C.—0.24 mhos/cm.; P<sub>2</sub>O<sub>5</sub>—13.2 Kg/ha. (iii) Mechanical analysis : N.A.

   E. No. of Experiments:
      
      Wheat—9, Barley—17, Bajra—11, Maize—8, Gram—1, Moong—5, Cumin—1 and Mixed crops—2. Total=54.
3. **Nadia Farm, Bharatpur.**

A. **General Information:**

(i) In Bharatpur district; 8 Km. from Bharatpur R.S.; The general topography of the experimental area is plain and low lying. (ii) N.A. (iii) 1965. (iv) **Rabi** :- Wheat, Barley, Mustard, Gram and Pea; **Kharif** :- Paddy, Jowar, Bajra, Til and Vegetables. (v) Nil.

B. **Normal Rainfall:**

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<tr>
<th></th>
<th>June to Sept.</th>
<th>Oct. to May</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall (cm.)</td>
<td>57.0</td>
<td>3.6</td>
<td>60.6</td>
</tr>
</tbody>
</table>

(Av. rainfall in cm.; based on the data for the period 1960-65).

C. **Irrigation and Drainage facilities:**

(i) (a) Yes. (b) By Girraj canal—only once during Rabi season, otherwise by pumps and tubewells. (ii) Yes; Proper drainage system exists.

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

(i) Soil type—Clay loam. (ii) Chemical analysis : pH—8.0; E.C. (in mhos/cm.)—0.4; O.C.—0.93%; P₂O₅—12.0 Kg/ha. ; The soil in non-alkaline, high in organic carbon percentage and low in available phosphorus. (iii) Mechanical analysis : N.A.

E. **No. of Experiments**:

Wheat—1. Total=1.

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4. **Kalmi Bagh, Bhusawar, Bharatpur.**

A. **General Information**:

(i) (a) In Bharatpur district; about 24 Km. from Bayana R.S.; The general topography of the experimental area is levelled. (ii) N.A. (iii) 1951—52. (iv) It is a nursery orchard. (v) Nil.

B. **Normal Rainfall**:

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<thead>
<tr>
<th></th>
<th>June to Sept.</th>
<th>Oct. to May</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall (cm.)</td>
<td>57.0</td>
<td>3.6</td>
<td>60.6</td>
</tr>
</tbody>
</table>

(Av. rainfall in cm.; based on the data for the period 1960—65).

C. **Irrigation and Drainage facilities**:

(i) (a) Yes, since establishment. (b) 2 wells fitted with pumping sets. (ii) Yes; Proper drainage system exists.

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

(i) Soil type—Sandy to sandy loam. (ii) Chemical analysis and (iii) Mechanical analysis : N.A.

E. **No. of Experiments**:

Groundnut—1. Total=1.
5. Government Seed Multiplication Farm, Bhilwara.

A. General Information:
   (i) Situated at Arjia in Bhilwara district; nearest Railway Station is Bhilwara; The general topography of the experimental area is levelled. (ii) It represents Mewar tract. (iii) 1957—58. (iv) Maize, Jowar, Moong, Cowpea, Wheat, Barley and Gram. (v) Nil.

B. Normal Rainfall:
   
   June to Sept.  
   Oct. to May  
   Total
   49.0  
   2.3  
   51.3  

(Av. rainfall in cm.; based on the data for the period 1960--65).

C. Irrigation and Drainage facilities:
   (i) (a) Yes, since establishment. (b) By well. (ii) No proper drainage system exists.

D. Soil type and Soil analysis:
   (i) Soil type—Sandy loam; Saline in patches; Colour—Brown; Structure—Granular.
   (ii) Chemical analysis: pH—7.9 to 9.0; E.C.—0.3 mhos/cm.; O.C.—0.130% to 0.135%.
   (iii) Mechanical analysis: N.A.

E. No. of Experiments:
   Wheat-1. Total=1.

6. Government Agriculture Farm, Bilara.

A. General Information:
   (i) In Jodhpur district; near Bilara R.S.; The general topography of the experimental area is levelled. (ii) Semi-arid tract. (iii) 1962. (iv) Fallow—Wheat; Bajra—Barley. (v) Research on all aspects of crops.

B. Normal Rainfall:
   Annual rainfall—50 cm. to 70 cm.
   (The period on which the figures are based is not available).

C. Irrigation and Drainage facilities:
   (i) (a) Yes, since establishment. (b) By well. (ii) No drainage problem.

D. Soil type and Soil analysis:
   (i) Depth—75 cm.; Colour—Brown. (ii) Chemical analysis: N—Low; P and K—Medium. (iii) Mechanical analysis: N.A.

E. No. of Experiments:

7. Government Agricultural Research Farm, Borkhera.

A. General Information:
   (i) In Ladpura tehsil of Kotah district; It is a levelled flat area: Slightly low lying. (ii) Medium black soils. (iii) 1960. (iv) N.A. (v) Working out judicious schedules of cultural and manurial requirements of major crops and plant protection research.
B. Normal Rainfall:

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</tr>
</thead>
<tbody>
<tr>
<td>Amount</td>
<td>10.0</td>
<td>10.3</td>
<td>13.8</td>
<td>47.3</td>
<td>6.6</td>
<td>1.2</td>
<td>0.7</td>
<td>5.4</td>
<td>0.2</td>
<td>0.1</td>
<td>5.4</td>
<td>0.2</td>
<td>86.6</td>
</tr>
</tbody>
</table>

(Av. rainfall in cm.; The period on which the averages are based is not available).

C. Irrigation and Drainage facilities:

(i) (a) and (b) Canal irrigation from 1960. In addition, there are three wells for emergency use. (ii) Yes, after each hectare-plot, there is a field drain which runs into the main drain leading to a natural nala.

D. Soil type and Soil analysis:

(i) Soil type—Medium black cotton soils. (ii) Chemical analysis: Available Nitrogen—Low to medium; Available Phosphate—Medium and Available Potash—Medium. (iii) Mechanical analysis: Clay—30%.

E. No. of Experiments:


8. Government Agriculture Farm, Bundi.

A. General Information:


B. Normal Rainfall:

<table>
<thead>
<tr>
<th></th>
<th>June to Sept.</th>
<th>Oct. to May</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount</td>
<td>62.8</td>
<td>2.0</td>
<td>64.8</td>
</tr>
</tbody>
</table>

(Av. rainfall in cm.; based on the data for the period 1960-65).

C. Irrigation and Drainage facilities:

(i) (a) Yes, since 1958 (8 ha. irrigated and 16 ha. rain-fed). (b) 2 electric pumping sets. (ii) No proper drainage system exists.

D. Soil type and Soil analysis:

(i) Soil type—Heavy clay loam; Colour—Medium black; Depth—1.5 m.; Structure—Columnar. (ii) Chemical analysis: pH—7.0 to 8.2; E.C.—0.5 to 0.8 mhos/cm. (iii) Mechanical analysis: N.A.

E. No. of Experiments:


9. Government Agriculture Farm, Chittorgarh.

A. General Information:

(i) In Chittorgarh district; about 3 K. m. from Chittorgarh R. S.: The general topography of the experimental area is mostly levelled. (ii) N.A. (iii) 1955. (iv) & (v) Nil.
B. Normal Rainfall:

<table>
<thead>
<tr>
<th></th>
<th>June to Sept.</th>
<th>Oct. to May</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>65.0</td>
<td>4.6</td>
<td>69.6</td>
</tr>
</tbody>
</table>

(Av. rainfall in cm.; based on the data for the period 1960-65).

C. Irrigation and Drainage facilities:

(i) (a) Yes, since 1963. (b) Canal irrigation and electric motors.

(ii) Yes, proper drainage system exists.

D. Soil type and Soil analysis:

(i) Soil type—Black cotton soil; Depth—1.0 m to 1.5 m; Colour—Black; Structure—Columnar. (ii) Chemical analysis: pH—8.2 (iii) Mechanical analysis: N.A.

E. No. of Experiments:

Opium—3. Total=3.

10. Janta College Farm, Dabok.

A. General Information:

(i) In Udaipur district; About 12 km. from Dabari R.S.; The experimental area is plain (ii) It represents rocky tract. (iii) 1956. (iv) Maize—Wheat is the main cropping pattern (v) Nil.

B. Normal Rainfall:

<table>
<thead>
<tr>
<th></th>
<th>June to Sept.</th>
<th>Oct. to May</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>56.7</td>
<td>3.6</td>
<td>60.3</td>
</tr>
</tbody>
</table>

(Av. rainfall in cm.; based on the data for the period 1960-65).

C. Irrigation and Drainage facilities:

(i) (a) Yes, since establishment. (b) Canal, well and 2 electric motors. (ii) Yes, proper drainage system exists.

D. Soil type and Soil analysis:

. . . (i) Soil type—Clay loam; Depth—1.0 m. to 1.5 m.; Colour—Light yellow to deep brown.; Structure—Columnar (Prisms with rounded tops). (ii) Chemical analysis: pH—5.5 to 6.5; Soil has sufficient amount of Potash but there is deficiency of N and P2O5. (iii) Mechanical analysis: N.A.

E. No. of Experiments:


11. Government Agriculture Farm, Dhakerkheri.

A. General Information:

(i) In Kota district; the nearest Railway Station is Kota; The topography of the experimental area is levelled. (ii) N.A. (iii) 1957. (iv) Paddy—Wheat; Paddy—Gram; Green manure—Wheat. (v) Experiments on Paddy, Wheat, Gram, etc. are conducted.

B. Normal Rainfall:

Av. annual rainfall is 90 cm.

(The period on which the figure is based is not available).
Kharif

<table>
<thead>
<tr>
<th>Crop</th>
<th>Existing pattern</th>
<th>Crop</th>
<th>Existing pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Paddy</td>
<td>6.0% of the total area</td>
<td>6. Kharif Oilseeds,</td>
<td></td>
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<tr>
<td>2. Maize</td>
<td>0.3% of the total area</td>
<td>Groundnut and Sunflower</td>
<td></td>
</tr>
<tr>
<td>3. Sugarcane</td>
<td>0.4% of the total area</td>
<td>7. Kharif Pulses</td>
<td></td>
</tr>
<tr>
<td>4. Fruits and Vegetables</td>
<td>0.8% of the total area</td>
<td>(Urad, Arhar,</td>
<td></td>
</tr>
<tr>
<td>5. Jowar</td>
<td>3.0% of the total area</td>
<td>Moong and Cowpea)</td>
<td></td>
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</table>

Rabi

<table>
<thead>
<tr>
<th>Crop</th>
<th>Existing pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wheat</td>
<td>30.0% of the total area</td>
</tr>
<tr>
<td>2. Rabi fodder</td>
<td>0.5% of the total area</td>
</tr>
<tr>
<td>3. Pea/Lentil</td>
<td>0.5% of the total area</td>
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</table>

(v) Various types of experiments are conducted on different crops.

B. Normal Rainfall:

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<tbody>
<tr>
<td>0·9</td>
<td>0·4</td>
<td>0·5</td>
<td>0·7</td>
<td>7·9</td>
<td>30·7</td>
<td>26·8</td>
<td>13·2</td>
<td>1·5</td>
<td>0·6</td>
<td>0·3</td>
<td>84·0</td>
</tr>
</tbody>
</table>

(Av. rainfall in cm.; based on the data of last 30 years).

C. Irrigation and Drainage facilities:

(i) (a) Yes, since establishment. (b) (1) Tubewell having a discharge of 1300 litres/hour. (2) Open surface well with a discharge of about 4500 litres/hour. (3) An outlet from Nanta minor of the Chambal Irrigation system feeds the farm with a discharge of 1·5 cusecs. (ii) Yes.

D. Soil type and Soil analysis:

(i) Soil type—Heavy clay loam; Colour—Medium black; Depth—1·5 m.; Structure—When dry:—Sets very hard and forms deep vertical cracks; When wet:—The fine clay particles tend to disperse losing mechanical strength. There is a very narrow range of moisture content.

(ii) Chemical analysis:—Organic matter content is very low, usually less than 1%. The lime content in the soil and sub-soil lies between 1 to 5%. Soils are low in N, P and K contents and moderately alkaline; pH—7·4 to 7·9; E.C. (in mhos/cm.)—0·5 to 0·8; Organic Carbon %—0·30 to 0·55; Available P₂O₅ (Kgf/ha.)—20 to 60; Available K₂O (Kgf/ha.)—50 to 67.

(iii) Mechanical analysis:—N.A.

E. No. of Experiments:

Paddy—2. Total=2.

17. Soil Conservation Research, Demonstration and Training Centre, Kota.

A. General Information:

(i) In Kota district with Lat.—25°11' N/Long.—75°51' E/Alt.—257 m.above M.S.L.; The farm area has a flat topography. The lands are nearly levelled (0·1% slope). Adjacent to
the agricultural fields, there are ravines as deep as 18·3 m. which have been formed due to
scavering action of Chambal river. (ii) Medium black soil tract. (iii) 1954. (iv) Dry farm-
ing. (v) Experiments on Agronomical, Soil Science, Forestry and Agriculture Engineering
aspects are conducted with special reference to soil and water conservation.

B. Normal Rainfall :

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</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>
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<tbody>
<tr>
<td></td>
<td>1-7</td>
<td>0-3</td>
<td>0-7</td>
<td>1-0</td>
<td>4-0</td>
<td>22-4</td>
<td>21-9</td>
<td>14-5</td>
<td>0-7</td>
<td>0-7</td>
<td>0-2</td>
<td>68-1</td>
<td></td>
</tr>
</tbody>
</table>

(Av. rainfall in cm.; based on the data for the period 1957-65).

C. Irrigation and Drainage facilities :

(i) (a) and (b) Nil. (ii) There are drains to take care of the excess water from the
fields.

D. Soil type and Soil analysis :

(i) Two types of soil—(a) Dark grey brown and (b) Brown; Depth—More than 1·5 m.;
Colour—Dark grey brown, brown and yellowish brown; Structure—Angular blocky and
blocky.

(ii) Chemical analysis: The soils are of medium fertility. The phosphorus is fixed up
due to high pH. Application of F.Y.M. helps in increasing the yield. N—0·032 to 0·05%; P₂O₅—0·05 to 0·08%.

(iii) Mechanical analysis: Clay content varies from 23 to 44%. The silt is nearly 20%.
Rest is sand.

E. No. of Experiments :

Wheat-11, Jowar-3 and Mixed crops-2. Total= 16.

18. Government Agricultural Farm, Mandore.

A. General Information :

(i) In Jodhpur tehsil of Jodhpur district; 0·2 Km. from Mandore R.S.; The land is
levelled. (ii) Desert. (iii) 1931. (iv) Fallow-wheat ; Legumes-Fallow-Bajra-Fallow. (v) N.A.

B. Normal Rainfall :

<table>
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<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
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<th>Oct</th>
<th>Nov</th>
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<td>0-2</td>
<td>0-6</td>
<td>0-4</td>
<td>9-9</td>
<td>9-5</td>
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<td>—</td>
<td>—</td>
<td>26·9</td>
<td></td>
</tr>
</tbody>
</table>

(Av. rainfall in cm.; based on the data for the period 1961-64).

C. Irrigation and Drainage facilities :

(i) (a) and (b) There are three wells at this farm and electric pumps have been fitted on
these wells. These wells were constructed prior to the formation of Rajasthan. (ii) There is
no drainage problem.

D. Soil type and Soil analysis :

(i) Depth—Deep soils ; Colour—Light brown ; Structure—Granular.

(ii) Chemical analysis ; N—131 to 306 Kg/ha.; P₂O₅—18 to 80·9 Kg/ha.; K₂O—146 to
448 Kg/ha. and pH—7·9 to 8·48.

(iii) Mechanical analysis : N.A.

E. No. of Experiments :

Wheat-16, Barley-3, Bajra-24, Moth-1, Moong-8, Pea-2, Til-1, Guar-2 and Mixed crops-1.
Total=58.
19. Government Seed Multiplication Farm, Ora-Sirohi.

A. General Information:
   (i) In Sirohi district; nearest Railway Station is Sirohi Road; The general topography of experimental area is levelled. (ii) Semi-humid tract. (iii) 1963. (iv) Fallow, Barley, G.M., Wheat, Mustard. (v) Research work on all aspects of crops.

B. Normal Rainfall:
   Annual rainfall ranges between 70 cm. to 90 cm.
   (The period on which the figures are based is not available).

C. Irrigation and Drainage facilities:
   (i) (a) Yes, since establishment. (b) by canal. (ii) No drainage problem.

D. Soil type and Soil analysis:
   (i) Depth—75 cm.; Colour—Dark brown. (ii) Chemical analysis: N—Low; P and K—Medium. (iii) Mechanical analysis: N.A.

E. No. of Experiments:
   Wheat-3 and Mustard-2. Total=5.

20. Government Agricultural Farm, Rampura.

A. General Information:
   (i) In Jodhpur District; near Marwar Mathania R.S.; The general topography of the experimental area is levelled. (ii) Arid tract. (iii) 1952. (iv) Chillies—Wheat—Bajra—Onion. (v) Research on all aspects of crops.

B. Normal Rainfall:
   Av. annual rainfall is 45.6 cm.
   (The period on which the figure is based is not available).

C. Irrigation and Drainage facilities:
   (i) (a) Yes, since establishment. (b) By well. (ii) No problem of drainage.

D. Soil type and Soil analysis:
   (i) Depth—75 cm.; Colour—Desert grey; Structureless soil. (ii) Chemical analysis: N—Low; P and K—Medium. (iii) Mechanical analysis: N.A.

E. No. of Experiments:
   Chillies-2. Total=2.

21. Government Seed Multiplication Farm, Sardargarh.

A. General Information to D. Soil type and Soil analysis: N.A.

E. No. of Experiments:
   Potato-1. Total=1.
22. Government Agriculture Farm, Sawai Madhopur.

A. General Information:
(i) In Sawai Madhopur tehsil of Sawai Madhopur district; fields are not very well levelled. (ii) Hilly tract on North side, but sandy and clayey loam tract on the other three sides. (iii) 1958. (iv) G.M.-Wheat-Maize; Wheat-Jowar-Fallow.

B. Normal Rainfall:

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<td>5</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>23</td>
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</table>

(Av. rainfall in cm.; based on the data for the period 1964-65).

C. Irrigation and Drainage facilities:
(i) (a) and (b) Irrigation facilities are available. (ii) No proper drainage system exists.

D. Soil type and Soil analysis:
(i) Sandy loam to clayey loam; brown to dark black in colour.
(ii) Chemical analysis and (iii) Mechanical analysis: N.A.

E. No. of Experiments:

23. Government Agriculture Farm, Sewar (Bharatpur).

A. General Information:

B. Normal Rainfall:

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan.</th>
<th>Feb.</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
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<td>0-4</td>
<td>0-5</td>
<td>0-9</td>
<td>1-4</td>
</tr>
<tr>
<td>Rainfall (cm.)</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>13-5</td>
</tr>
</tbody>
</table>

(Av. fortnightly rainfall in cm.; based on the data for the period 1969-71).

C. Irrigation and Drainage facilities:
(i) (a) Proper irrigation facilities available since 1968. (b) Three tubewells and trapejodial channels supplied by underground pipe lines. (ii) Drainage facilities not available.

D. Soil type and Soil analysis:
(i) Clay loam soil.
(ii) Chemical analysis: N—Low to medium; P<sub>2</sub>O<sub>5</sub>—Medium; K<sub>2</sub>O—High; pH—7-2 to 7-9; E.C.—0-35 to 1-25 mhos/cm.
(iii) Mechanical analysis: N.A.

E. No. of Experiments:
Potato-2, Groundnut-1 and Mustard-1. Total=4.
24. Government Agriculture Research Farm, Sriganganagar.

A. General Information:
   (i) In Sriganganagar tehsil of Sriganganagar district; Levelled. (ii) Indo-Gangetic alluvial plains of North India. (iii) 1949. (iv) Sugarcane-Cotton-Wheat. (v) Experiments are conducted on Botanical, Agronomic, Entomological and Plant Pathological aspects.

B. Normal Rainfall:
   0.6 0.2 0.7 0.5 2.6 2.0 5.4 5.5 6.8 0.3 0.3 0.7 25.6
   (Av. rainfall in cm.; based on the data for the period 1961–64).

C. Irrigation and Drainage facilities:
   (i) (a) and (b) Irrigation by canal. (ii) No proper drainage system exists.

D. Soil type and Soil analysis:
   (i) Sandy loam; light brown in colour and granular in structure. (ii) Chemical analysis: pH—8.2; Available N—191 Kg/ha.; Available P₂O₅—28 Kg/ha.; Available Potash—258 Kg/ha. (iii) Mechanical analysis: Clay—15.8%, Silt—22.5%, Coarse sand—1.2% and Fine sand—60.5.

E. No. of Experiments:
   Paddy-2, Wheat-30, Barley-2, Maize-1, Gram-12, Urd-4, Brinjal-1, Pea-7, Sugarcane 9, Cotton-8, Groundnut-4, Mustard-13, Guar-1, Jowar (fodder)-1, Fodder crops-3 and Mixed crops-1. Total=100.

25. Government Agriculture Research Farm, Sultanpur.

A. General Information:
   (i) In Kota district; nearest Railway Station is Digod; Lat.—76°11’ N/Long.—25°18’E; Alt.—778.6 m. above M.S.L.; It represents plain topography. (ii) Harati tract. (iii) From 1961 to 1969 as research farm and from 1970 as seed farm. (iv) Paddy—Wheat; Fallow—Wheat; Paddy—Gram. (v) Nil.

B. Normal Rainfall:
   90 cm. (Total rainfall from 15th June, 1972 to 15th Oct., 1972).

C. Irrigation and Drainage facilities:
   (i) (a) and (b) Irrigation by canal since 1961. (ii) No proper drainage system.

D. Soil type and Soil analysis:
   (i) Black cotton soil; Depth—1.52 m. to 1.82 m.; Colour—Black; Structure—Fine. (ii) Chemical analysis: Conductivity—0.45 to 2.20 in different plots; Organic Carbon—0.45 to 1.05 in different plots; Phosphate—9.0 to 50.6 in different plots. (iii) Mechanical analysis: Not Available.

E. No. of Experiments:
26. Agricultural Research Station, Sumerpur.

A. General Information:
(i) In Pali district; nearest Railway station is Jawai Bandh; The general topography of the experimental area is levelled. (ii) Semi-arid tract. (iii) 1958-59. (iv) Bajra-Wheat, Guar-Wheat, Moong-Barley, Til-Barley, Cowpea-Mustard. (v) Research on all aspects of crops.

B. Normal Rainfall:
Annual rainfall ranges between 55 cm. to 75 cm. (The period on which the data are based is not available).

C. Irrigation and Drainage facilities:
(i) Yes, since establishment. (b) Well and Jawai canal. (ii) No drainage problem.

D. Soil type and Soil analysis:
(i) Sandy loam; Depth—75 cm.; Colour—Brown; Structure—Massive. (ii) Chemical analysis: Available N—Low; Available P & K—Medium; pH—7·7; E.C.—Normal. (iii) Mechanical analysis: Sand%—68, Silt%—17 and Clay%—14%.

E. No. of Experiments:
Wheat-2 and Maize-1. Total=3.

27. Government Agricultural Farm, Tabiji.

A. General Information:
(i) In Ajmer tehsil of Ajmer district; 5 km. from Tabiji R.S.; Fairly levelled land. (ii) Sandy loam tract. (iii) 1930. (iv) Kharif: Bajra, Maize, Cotton, Groundnut, Moong and Cowpea. Rabi: Wheat, Barley, Gram, Pea and Raya. (v) Experiments on different aspects such as Agronomy, Breeding, Agriculture Chemistry, Entomology, Economic Botany, Pathology, etc. are conducted.

B. Normal Rainfall:
--- --- --- --- --- --- --- --- --- --- --- --- --- --- 40·4
(Av. rainfall in cm.; based on the data for the period 1960-64).

C. Irrigation and Drainage facilities:
(i) (a) and (b) 5 wells, out of which 3 are fitted with electric motors and centrifugal pumps since 1956; before this Charas was used. (ii) There is no problem of water logging and natural drainage system exists.

D. Soil type and Soil analysis:
(i) Sandy loam; Light brown in colour; 1·52 to 1·83 m. deep. (ii) Chemical analysis and (iii) Mechanical analysis: N.A.

E. No. of Experiments:

28. Government Agriculture Farm, Tonk.

A. General Information:
(i) In Tonk district; nearest Railway Station is Banasthali Newai. (ii) Plain except some ravine spots. (iii) Since the times of old Tonk state. (iv) Fallow-Gram; Bajra-Wheat; Til-Gram; Jowar-Fallow. (v) This is a seed multiplication farm, but some trials are conducted.
B. **Normal Rainfall**:  
Av. annual rainfall—54·7 cm.  
(based on the data for the period 1964—67).

C. **Irrigation and Drainage facilities**:  
(i) (a) Yes, since the establishment of the farm. (b) Well irrigation for about 3·5 ha.  
(ii) No problem of drainage.

D. **Soil type and Soil Analysis**:  
(i) Soil type—Sandy loam; Colour—Greyish.  
(ii) Chemical analysis: pH—Normal.  
(iii) Mechanical analysis: N.A.

E. **No. of Experiments**:  
Cumin-4. Total=4.

29. **Government Agricultural (Rajasthan College of Agriculture) Farm, Udaipur**.

A. **General Information**:  
(i) In Udaipur district; 4·8 Km. from Udaipur R.S.  
(ii) N.A.  
(iii) Established in 1957.  
(iv) Maize.  
(v) N.A.

B. **Normal Rainfall**:  
Information N.A.

C. **Irrigation and Drainage facilities**:  
(i) (a) and (b) Irrigation is done by well.  
(ii) N.A.

D. **Soil type and Soil analysis**:  
(i) Clay loam.  
(ii) Chemical analysis and (iii) Mechanical analysis: N.A.

E. **No. of Experiments**:  
Paddy-1, Wheat-8, Jowar-1, Maize-12 and Groundnut-1. Total=23.

30. **Vidya Bhawan Rural Institute, Udaipur**.

A. **General Information**:  
(i) In Udaipur district; 5 Km. from Udaipur R.S. with Lat.—24·5°N/Long.—73·6°E; The farm is fairly well established on the road side from Udaipur to Gogunda in the East direction and canal and hillock in the West direction. The North direction of the farm area is a consolidated one and suitable for experimentation.  
(ii) Plains surrounded by hills.  
(iii) 1956.  
(iv) Rabi—Wheat, Barley and Pea.  
Kharif—Maize  
(v) Regular trials on Sugarcane, Maize, Wheat, etc. are laid out.

B. **Normal Rainfall**:  
— — 20·3 — — 3·8 12·7 20·3 6·4 — — 63·5  
(Av. rainfall in cm.; based on the data for the period 1966-67).

C. **Irrigation and Drainage facilities**:  
(i) (a) Irrigation facilities are available since establishment.  
(b) Irrigated by canal.  
(ii) There is no proper drainage system but at the same time the fields are well drained and excess of rain water can be drained out by the side ditches.
D. Soil type and Soil analysis:

(i) Soil type—Sandy loam and loam; Depth—23 cm. to 30 cm.; Colour—Brown; Structure—N.A. (ii) Chemical analysis: Nitrogen—1.40 (normal); Phosphorous—1.96; Potash—2.24 (normal). (iii) Mechanical analysis: N.A.

E. No. of Experiments:

Wheat 2, Maize-1 and Sugarcane-5. Total=8.


A. General Information:

In Udaipur district.

B. Normal Rainfall to D. Soil type and Soil analysis: Information N.A.

E. No. of Experiments:

Groundnut-1. Total=1.

32. Mechanised Government Agriculture Farm, Ummedganj.

A. General Information:

(i) In Kota district; nearest Railway Station is Kota City; The general topography of the experimental area is mostly levelled. (ii) N.A. (iii) 1960. (iv) Fallow-Wheat; Maize-Wheat; Paddy-Wheat; Bajra-Wheat; Jowar-Wheat. (v) Nil.

B. Normal Rainfall:

<table>
<thead>
<tr>
<th></th>
<th>June to Sept.</th>
<th>Oct. to May.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
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<td>65·0</td>
<td>3·7</td>
<td>68·7</td>
</tr>
</tbody>
</table>

(Av. rainfall in cm.; based on the data for the period 1960-65).

C. Irrigation and Drainage facilities:

(i) (a) Yes, since establishment. (b) By canal and lift pump from perennial nallas. (ii) Yes, there is a proper drainage system.

D. Soil type and Soil analysis:

(i) Soil type—Medium Black Cotton Soil; (ii) Chemical analysis: Available N—Medium; Available P₂O₅—Low to medium; Available K₂O—Low to medium. (iii) Mechanical analysis: N.A.

E. No. of Experiments:

Cotton—2 and Linseed—1. Total=3.
EXPERIMENTAL DATA
Crop: Paddy (Kharif).
Site: Govt. Agri. Farm; Banswara.
Ref: Rj 63(6).
Type: ‘M’. 

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

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) Sandy loam.  (iii) 20.8.63.  (iv) to (ix) N.A.  (x) 30.11.63.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A/S: \( N_0 = 0 \), \( N_1 = 33.6 \) and \( N_2 = 67.3 \) Kg/ha.
   (2) 3 levels of \( P_2O_5 \) as Super: \( P_0 = 0 \), \( P_1 = 33.6 \) and \( P_2 = 67.3 \) Kg/ha.
   (3) 2 levels of \( K_2O \) as Mur. Pot.: \( K_0 = 0 \) and \( K_1 = 33.6 \) Kg/ha.

3. DESIGN:
   (i) 3\(^2\) x 2 confd.  (ii) (a) 6 plots/block; 3 blocks/replication.  (b) N.A.  (iii) 2.  (iv) (a) 9.2 m. x 5.5 m.
   (b) 7.4 m. x 3.7 m.  (v) 91 cm. x 91 cm.  (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A.  (iii) Yield grain.  (iv) (a) 1963 only.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
   (i) 3.045 Kg/ha.  (ii) 452.0 Kg/ha.  (iii) Main effect of N alone is highly significant.  (iv) Yield of grain
   in Kg/ha.

\[
\begin{array}{|c|c|c|c|c|c|}
\hline
 & P_0 & P_1 & P_2 & K_0 & K_1 & \text{Mean} \\
\hline
N_0 & 2450 & 2386 & 2968 & 2441 & 2762 & 2601 \\
N_1 & 3052 & 3255 & 3320 & 3150 & 3267 & 3209 \\
N_2 & 3380 & 3126 & 3468 & 3295 & 3354 & 3325 \\
\hline
\text{Mean} & 2961 & 2922 & 3252 & 2962 & 3128 & 3045 \\
\hline
K_0 & 3030 & 2651 & 3206 & & & \\
K_1 & 2891 & 3193 & 3298 & & & \\
\hline
\end{array}
\]

C.D. for N marginal means = 393.0 Kg/ha.

Crop: Paddy (Kharif).
Site: Govt. Agri. Res. Farm, Borkhera.
Ref: Rj. 62(83), 63(30), 64(29).
Type: ‘M’.

Object: To study the effect of N, P and K applied alone and in combination on the yield of Paddy.
1. BASAL CONDITIONS:

(i) (a) Nil. for 62(83) and 64(29) Fallow-Wheat-Paddy for 63(30). (b) N.A. for 62(83); Wheat for 63(30); Fallow for 64(29). (c) N.A. for 62(83); Nil for others. (ii) Medium clay soil. (iii) N.A.; 21.6.1963; 20.6.1964. (iv) (a) 4 ploughings, 2 bakhenings and 1 planking for 62(83); 2 puddlings for 63(30); 1 disc ploughing, 1 planking 1 disc harrowing and 1 puddling for 64(29). (b) Line sowing for 62(83); Broadcasting for others. (c) N.A. for 62(83); 74 Kg/ha. for 63(30) and 64(29). (d) 23 cm. between lines for 62(83); N.A. for others. (e) N.A. (vi) N.A. for 62(83), 63(30); Nil for 64(29). (vii) N.P.—130. (viii) Irrigated. (ix) 1 to 2 weedings. (x) N.A. for 62(83); 84 cm. for 63(30); 72 cm. for 64(29). (a) N.A. for 62(83); 6, 7.10.1963; 29, 30.9.1964.

2. TREATMENTS:

All combinations of (1), (2) and (3)

(1) 3 levels of N as A/S: No=0, N 1 =44·8 and N 2 =89·7 Kg/ha.

(2) 3 levels of P 0 6 as Super: P 0 =0, P 1 =44·8 and P 2 =89·7 Kg/ha.

(3) 3 levels of K 0 6 as Pot. Sul.: K 0 =0, K 1 =44·8 and K 2 =89·7 Kg/ha.

3. DESIGN:

(i) 3 3 confd. (ii) [a] 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 7·9 m. X 5·5 m. (b) 7·3 m. X 4·9 m. (v) 30 cm. X 30 cm. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1562 to 1964. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) and (vi) Nil. (vii) The error variances are heterogeneous and Treatments x years interaction is present.

5. RESULTS:

(i) 2946 Kg/ha. (ii) 6200 Kg/ha. [28 d.f. made up of interactions of N, P, K, N X P, N X K with years]. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<th></th>
<th>P 0</th>
<th>P 1</th>
<th>P 2</th>
<th>K 0</th>
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Mean 2607 3064 3168

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</table>

C.D. for N or P marginal means=244·3 Kg/ha.

Crop:- Paddy (Kharif).
Site:- Govt. Agri. Res. Farm, Borkhera.

Object : To find out the suitable source, level and time of application of N for Paddy.

1. BASAL CONDITIONS:

(i) (a) Peas-Fallow-Wheat-Paddy. (b) Wheat. (c) Nil. (ii) Medium clay soil. (iii) 4 to 7.7.1963. (iv) (a) 2 puddlings and laddering. (b) Transplanting. (c) N.A. (d) 30 cm. X 30 cm. (e) N.A. (v) N.A. (vi) N.P.—130. (vii) Unirrigated. (viii) 2 weedings. (ix) 84 cm. (x) 7.10.1963.
2. TREATMENTS:

Main-plot treatments:
- 4 sources of N: S1 = A/S, S2 = A/S/N, S3 = C/A/N and S4 = Urea.

Sub-plot treatments:
- All combinations of (1) and (2)
  (1) 3 levels of N: N0 = 0, N1 = 44.8 and N2 = 89.7 Kg/ha.
  (2) 2 times of application of fertilizers: T1 = 2 doses and T2 = 3 doses.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 5.5 m × 4.8 m. (b) 4.9 m × 3.1 m. (v) 30 cm × 76 cm. (vi) Yes.

4. GENERAL:

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

5. RESULTS:

(i) 3369 Kg/ha. (ii) (a) 593.0 Kg/ha. (b) 686.0 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for N marginal means = 343.0 Kg/ha.

Crop: Paddy (Kharif). Site: Govt. Agri. Farm, Jatsar.

Ref: Rj. 62(37). Type: ‘M’.

Object: To study the effect of N, P and K applied alone and in combinations on Paddy.

1. BASAL CONDITIONS:

(i) (a) Fallow-Paddy. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) 7.7.62. (iv) (a) 2 ploughings. (b) Transplanting. (c) 25 Kg/ha. (d) N.A. (e) 2. (v) T-21. (vi) Irrigated. (vii) Weeding. (ix) N.A. (x) 10.11.62.

2. TREATMENTS:

All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S: N0 = 0, N1 = 44.8 and N2 = 89.7 Kg/ha.
(2) 3 levels of P2O5 as Super: P0 = 0, P1 = 44.8 and P2 = 89.7 Kg/ha.
(3) 3 levels of K2O as Muri. Pot: K0 = 0, K1 = 22.4 and K2 = 44.8 Kg/ha.
N applied 1/2 dose at sowing by broadcast and 1/2 top dressed after one month. P2O5 drilled at sowing and K2O by broadcast at sowing.

3. DESIGN:

(i) 3rd conf. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 6.1 m × 4.6 m. (b) 5.6 m × 4.1 m. (v) 23 cm × 23 cm. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain. (iv) to (vii) N.A.
5. RESULTS:
(i) 2303 Kg/ha. (ii) 439.7 Kg/ha. (iii) Main effect of N alone is highly significant (iv) Av. yield of grain in Kg/ha.

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<tr>
<th></th>
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<th>P₁</th>
<th>P₂</th>
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C.D. for N marginal means = 303.8 Kg/ha.

Crop :- Paddy (Kharif).
Site :- Govt. Agri. Res. Farm, Sriganganagar.
Object :- To study the effect of different times of application of N as Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) 19.7.1965. (iv) (a) Ploughing by desi plough and patta. (b) Dibbling. (c) N.A. (d) 23 cm. x 15 cm. (e) 2. (v) 74.1 Kg/ha. of N and 49.4 Kg/ha. of P₂O₅.

2. TREATMENTS:
9 times of applications of N : M₁=Full dose at transplanting, M₂=Full dose at 30 days of transplanting, M₃=Half at transplanting+half after 30 days, M₄=Half at transplanting+half at flowering, M₅=Half after one month+half at flowering, M₆=Half at transplanting+one fourth after 30 days+one fourth at flowering, M₇=One fourth at transplanting+one fourth after 30 days+half at flowering and M₈=One third at transplanting+one third after 30 days+one third at flowering.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 4.6 m. x 3.7 m. (b) 4.1 m. x 3.2 m. (v) 23 cm. x 23 cm.
(vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Stand, tiller, height, no. of ears/plant and yield of grain. (iv) (a) 1965—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1359 Kg/ha. (ii) 482.0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
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<td>1158</td>
<td>1600</td>
<td>1348</td>
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C.D. = 703.4 Kg/ha.
Crop: Paddy (Kharif).  
Site: Raj. College Agri. Farm, Udaipur.  
Object: To find out the effect of different concentrations of iron and zinc applied alone and in combinations through soil and by spraying on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Wheat. (c) 44.8 Kg/ha. of N as A/S. (ii) Sandy Clay loam. (iii) 8.6.1961. (iv) (a) 3 ploughings with mould board plough. (b) Transplanting. (c) —. (d) and (e) N.A. (v) 44.8 Kg/ha. of N+22.4 Kg/ha. of P₂O₅ and 22.4 Kg/ha. of K₂O. (vi) T—3. (vii) Irrigated. (viii) Weeding once a week followed by a light hoeing with an iron pointed peg. (ix) Negligible. (x) 12 to 18.10.1961.

2. TREATMENTS:
   13 manurial treatments: T₀=Control (2 plots), T₁=16.7 Kg/ha. of Fe. Sul. in soil, T₂=27.8 Kg/ha. of Fe. Sul. by spray, T₃=10.2 Kg/ha. of Zn. Sul. in soil, T₄=5.6 Kg/ha. of Zn. Sul. by spray, T₅=T₁+T₃, T₆=T₂+T₄, T₇=T₃+T₅, T₈=T₄+T₆, T₉=T₂+T₄, T₁₀=T₃+T₅, T₁₁=T₄+T₆, T₁₂=T₅+T₇, T₁₃=T₆+T₈.

3. DESIGN:
   (i) R.B.D. (ii) (a) 14. (b) 35.2 m. x 18.6 m. (iii) 4. (iv) (a) 9·1 m. x 5·0 m. (b) 8·2 m. x 4·1 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Height of plants, number of tillers, yield of grain and straw. (iv) (a) No. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 3712 Kg/ha. (ii) 458.0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
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<th>T₃</th>
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...
Crop: Paddy (Kharij). Ref: Rj. 63(31), 64(20), 65(18).
Site: Govt. Agri. Res. Farm, Sultanpur. Type: ‘C’.

Object: To find out the optimum date of planting and suitable spacing for Paddy.

1. BASAL CONDITIONS:
(i) Nil. (b) Fallow for 63(31), 65(18), Gram for 64(20). (c) Nil for 63(31), 65(18), 22.4 Kg/ha. of P₂O₅ for 64(20). (ii) Sandy loam. (iii) As per treatments. (iv) (a) 6 ploughings for 63(31) and 64(20), 1 to 2 ploughings, 1 puddling and 1 bakhenning for 65(18). (b) Transplanting. (c) N.A. (d) As per treatments. (e) 2 to 4. (v) 45 Kg/ha. of N applied half at the time of transplanting and half as top dressing + 24 Kg/ha. of P₂O₅ applied at transplanting for 63(31), 45 Kg/ha. of N + 45 Kg/ha. of P₂O₅ by drilling at the time of sowing for 64(20), Nil for 65(18). (vi) N.P. = 130. (vii) Irrigated. (viii) 1 to 3 weedings. (ix) N.A. for 63(31), 65(18), 72 cm. for 64(20). (x) N.A. for 63(31), 4.10.1964 to 11.12.1964, 27.9.65 to 9.12.1965.

2. TREATMENTS:
Main-plot treatments: 7 dates of transplanting: D₁ = 10th June, D₂ = 25th June, D₃ = 10th July, D₄ = 25th July, D₅ = 10th August, D₆ = 25th August, and D₇ = 12th September.
Sub-plot treatments: 6 spacings: S₁ = 10 cm. × 10 cm, S₂ = 10 cm. × 20 cm, S₃ = 10 cm. × 30 cm, S₄ = 20 cm. × 20 cm, S₅ = 20 cm. × 30 cm, and S₆ = 30 cm. × 30 cm.

3. DESIGN:
(i) Split-plot. (ii) (a) 7 main-plots/replication, 6 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 4.27 m. × 3.0 m., (b) 3.7 m. × 2.4 m. (v) 30 cm. × 30 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) 1963 to 1965. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Since the sub-plot error variances are heterogeneous, the results of individual years are presented yield for treatment D₂ is N.A.

5. RESULTS:
63(31)
(i) 2921 Kg/ha. (ii) (a) 618 Kg/ha. (b) 179 Kg/ha. (iii) Main effects of D and S are highly significant. (iv) Av. yield of grain in Kg/ha.

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<th>D₃</th>
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C.D. for D marginal means = 448.9 Kg/ha.
C.D. for S marginal means = 119.2 Kg/ha.

64(20)
(i) 1897 Kg/ha. (ii) (a) 499 Kg/ha. (b) 337 Kg/ha. (iii) Main effects of D, S are highly significant. Interaction D × S is significant. (iv) Av. yield of grain in Kg/ha.

(i) 1897 Kg/ha. (ii) (a) 499 Kg/ha. (b) 337 Kg/ha. (iii) Main effects of D, S are highly significant. Interaction D × S is significant. (iv) Av. yield of grain in Kg/ha.
<table>
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C.D. for D marginal means = 361·7 Kg/ha.
C.D. for S marginal means = 207·7 Kg/ha.
C.D. for S means at the same level of D = 551·1 Kg/ha.
C.D. for D means at the same level of S = 618·3 Kg/ha.

(i) 1677 Kg/ha.  (ii) (a) 890·9 Kg/ha.  (b) 481·2 Kg/ha.  (iii) Main effects of D and S are highly significant.  (iv) Av. yield of grain in Kg/ha.

<table>
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<th></th>
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C.D. for D marginal means = 647·1 Kg/ha.
C.D. for S marginal means = 296·6 Kg/ha.

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Crop: Paddy (Kharif).
Site: Govt. Agri. Res. Farm, Borkhera.
Ref.: Rj. 62(53).
Type: ‘CV’.

Object: To find out the suitable method of sowing for different varieties of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Gram-G.M.—Wheat-fallow-Paddy.  (b) Fallow.  (c) Nil.  (ii) Medium clay soil.  (iii) N.A.  (iv) (a) 4 ploughings, 2 bakhering.  (b) As per treatments.  (c) 49 Kg/ha.  (d) Rows 30 cm apart.  (e) N.A.  (v) N.A.  (vi) As per treatments, (vii) Irrigated.  (viii) 2 weedings.  (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   5 methods of sowing: M₁=Broadcasting, M₂=Drilling, M₃=Bushening, M₄=Transplanting and M₅=Drilling.
   Sub-plot treatments:
3. DESIGN:
(i) Split-plot. (ii) (a) 5 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 3.7 m x 3.1 m. (b) 3.1 m x 2.4 m. (v) 30 cm x 30 cm. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962 only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 2452 Kg/ha. (ii) (a) 836.7 Kg/ha. (b) 597.3 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for M marginal means = 576.3 Kg/ha.

Crop :- Paddy (Kharij).
Site :- Govt. Agri. Res. Farm, Sultanpur.
Type :- ‘CV’.

Object :- To find out a suitable method of sowing with different varieties of Paddy.

1. BASAL CONDITIONS:
(i) (a) Barley-Paddy-Gram for 63(29); N.A. for 64(15). (b) Barely for 63(29); Gram for 64(15). (c) Nil for 63, 29; 22.6 Kg/ha. of N + 18.6 of P<sub>2</sub>O<sub>5</sub> for 64(15). (ii) N.A. (iii) 7.7.1953; 1.7.1954. (iv) (a) 3 plantings; 2 bakhees; 3 p.d. for 63, 29. (b) As per treatments. (c) to (e) N.A. (f) Nil. for 63(29); 45 Kg/ha. of N + 45 Kg/ha. of P<sub>2</sub>O<sub>5</sub> by drilling for 64(13). (vi) As per treatments. (vii) Irrigated. (viii) 1 to 2 weedings. (ix) 81 cm; 72 cm. (x) 25.9.1963 and 10.10.1964.

2. TREATMENTS:
Main-plot treatments:
5 methods of sowing: M<sub>1</sub>=Broadcasting, M<sub>2</sub>=Drilling, M<sub>3</sub>=Bushaming, M<sub>4</sub>=Transplanting and M<sub>5</sub>=Dibbling.

Sub-plot treatments:
5 varieties: V<sub>1</sub>=Bassati, V<sub>2</sub>=K<sub>1</sub> mill, V<sub>3</sub>=N.P.—130, V<sub>4</sub>=M.F.U—15 and V<sub>5</sub>=T—21.

3. DESIGN:
(i) Split-plot. (ii) (a) 5 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. for 63(29), 20.8 m x 3.1 m. for 64(15). (iii) 4. (iv) (a) 3.7 m x 3.1 m. (b) 3.1 m x 2.4 m. (v) 30 cm x 30 cm. (vi) Yes.

4. GENERAL:
(i) N.A. for 63(29), Good for 64(15). (ii) N.A. for 63(29), Nil for 64(15). (iii) Yield of grain. (iv) (a) 1963 to 1964. (b) No. (c) Results of combined analysis are given under 5. (v) and (vi) N.A. (vii) Both the error variances are homogeneous, and Treatments x years interaction for main-plots and sub-plots are presented.

5. RESULTS:
(i) 2410 Kg/ha. (ii) (a) 1704.4 Kg/ha. (based on 4 d.f. made up of Treatments x years interaction). (b) 609.7 Kg/ha. (based on 14 d.f. made up of Treatments x years interaction and pooled error). (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in Kg/ha.
Crop :- Paddy (Kharif).

Site :- Govt. Agri. Farm, Jatsar.

Object :- To find out the optimum date of transplanting, fertiliser requirement and suitable spacing for Paddy.

1. BASAL CONDITIONS :
   (i) (a) Paddy-Fallow. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) As per treatments (iv) (a) 3 ploughings and 1 puddling. (b) Transplanting. (c) N.A. (d) As per treatments. (e) N.A. (v) 33·6 Kg/ha. of P_{2}O_{5}. (vi) T—21 (medium). (vii) Irrigated. (viii) 2 hand hoeings. (ix) N.A. (x) 18.11.63.

2. TREATMENTS :
   Main-plot treatments: 3 dates of transplanting : D_{1}=26.6.1963, D_{2}=17.7.1963 and D_{3}=18.8.1963.
   Sub-plot treatments: 3 spacings : S_{1}=15 cm. x 15 cm., S_{2}=23 cm. x 23 cm. and S_{3}=30 cm. x 30 cm.
   Sub-sub-plot treatments: 3 levels of N : N_{6}=0, N_{1}=33·6, N_{2}=67·2 Kg/ha.

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/replication, 3 sub-plots main-plot, 3 sub-sub-plot/sub-plot. (b) N.A.
   (iii) 5. (iv) (a) N.A. (b) 4·6 m. x 3·7 m. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963 to 1965 (Treatments modified). (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 589 Kg/ha. (ii) (a) 392·0 Kg/ha. (b) 206·0 Kg/ha. (c) 204·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

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Mean 2122 2427 3114 2167 2219 2410

C.D. for V marginal means=269·9 Kg/ha.

Ref :- Rj. 63(35).

Type :- 'CM'.
Crop :- Paddy (Kharif).
Ref :- Rj. 65(14).
Site :- Govt. Agri. Farm, Jatsar.
Type :- 'CM'.

Object :- To find out the optimum date of transplanting, fertilizers requirement and suitable spacing for Paddy.

1. BASAL CONDITIONS :
(i) (a) Paddy-Fallow-Paddy. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) As per treatments. (iv) (a) Ploughing an 1 planking. (b) and (c) N.A. (d) As per treatments. (e) 2. (v) 494 Kg/ha. of P_{2}O_{5}. (vi) T-21. (vii) Irrigated. (viii) 2 haings and weodings. (ix) N.A. (x) 15, 22 and 31.10.65.

2. TREATMENTS :
Main-plot treatments :
- 3 dates of transplanting: D_{1}=23.6.65, D_{2}=18.7.65 and D_{3}=25.8.65.
Sub-plot treatments :
- 3 spacings: S_{1}=15 cm. x 15 cm., S_{2}=23 cm. x 23 cm. and S_{3}=30 cm. x 30 cm.
Sub-sub-plot treatments :
- 3 levels of N: N_{0}=0, N_{1}=27.1 and N_{2}=74.2 Kg/ha.

3. DESIGN :
(i) Split-plot. (ii) (a) 3 main-plots/replication; 3 sub-plots/main-plot, 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 2.7 m. x 2.7 m. (b) 1.8 m. x 1.8 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL :
(i) G x S. (ii) Nil. (iii) Height, tiller count, stand and number of ears/plant and yield of grain. (iv) (1) 133 to 55 (61 N.A. Treatments x 1/3:1). (b) N.A. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 1242 Kg/ha. (ii) (a) 623.6 Kg/ha. (b) 613.2 Kg/ha. (c) 311.8 Kg/ha. (iii) Main effects of D and N are highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for D marginal means = 471.1 Kg/ha.
C.D. for N marginal means = 172.2 Kg/ha.
1. BASAL CONDITIONS:
   (i) (a) Fallow-Paddy. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) As per treatments. (iv) (a) 4 ploughings, 1 discing and 2 pattas. (b) Transplanting. (c) Nil. (d) As per treatments. (e) 2. (v) 37 Kg/ha. of P₂0₅ as Super, by broadcast. (vi) T-21. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 9 to 12.10.1964.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   3 spacings: S₁ = 15 cm. x 15 cm., S₂ = 23 cm. x 23 cm. and S₃ = 30 cm. x 30 cm.
   Sub-sub-plot treatments:
   3 levels of N: N₀ = 0, N₁ = 16.8 and N₂ = 33.6 Kg/ha. of N.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication, 3 sub-plots/main-plot, 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) 3' 2 m. x 3' 2 m. (b) 2' 7 m. x 2' 7 m. (v) 23 cm. x 23 cm. (vi) Yes.

4. GENERAL:
   (i) Very good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964 only. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 3626 Kg/ha. (ii) (a) 7710 Kg/ha. (b) 6320 Kg/ha. (c) 5390 Kg/ha. (iii) Main effects of D and N are highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for D marginal means = 582'4 Kg/ha.
C.D. for N marginal means = 297'8 Kg/ha.

Crop :- Paddy (Kharif).
Site :- Irrigation Res. Stn., Kota.
Object :- To study the effect of submergence at different stages of crop growth and weedings on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) Heavy clay. (iii) 8.8.64. (iv) (a) 3 ploughings. (b) Transplanting. (c) Nil. (d) 30 cm. x 10 to 15 cm. (e) 4'. (v) 44'8 Kg/ha. of N and 44'8 Kg/ha. of P₂O₅ by broadcast. (vi) NP-130. (vii) and (viii) As per treatments. (ix) 72 cm. (x) 25.10.64.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1), (2) and (3) with one control (No irrigation)
   (1) 2 levels of submergence from plant establishment to tillering: A₀ = No submergence and A₁ = Submergence.
   (2) 2 levels of submergence from tillering to emergence: B₀ = No submergence and B₁ = Submergence.
   (3) 2 levels of submergence from emergence and maturity: C₀ = No submergence and C₁ = Submergence.
Sub-plot treatments:
3 types of weedings: 
W₀ = No weeding, W₁ = Hand weeding and W₂ = Chemical weeding.
In no submergence irrigation was given according to the field capacity.

3. DESIGN:
(i) Split-plot. (ii) (a) 9 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4 irrigation schedule: 
I₁ = Standing water, I₂ = Irrigations when ever necessary to keep field wet, I₃ = Irrigation after keeping field dry for 3 days and I₄ = Irrigation after keeping field dry for 6 days.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 varieties: V₁ = Basmati and V₂ = N.P. - 130.
(2) 3 seed rates: S₁ = 44.8, S₂ = 89.7 and S₃ = 134.5 Kg/ha.

5. RESULTS:
(i) 2322 Kg/ha. (ii) (a) 691.0 Kg/ha. (b) 440.0 Kg/ha. (iii) None of the effects is significant. (iv) Avg. yield of grain in Kg/ha.

Crop: - Paddy (Kharif).
Site: - Govt. Agri. Res. Farm, Borkhera.

Object: - To find out the best irrigation schedule and seed rate for broadcasting Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. for 63(28); Fallow for 64(14) and 65(11). (c) N.A. for 63(28); Nil for 64(14), 65(11). 
(iv) (a) 4 ploughings for 63(28); Disc ploughing, planking disc harrowing, palewa and puddling for 64(14), 65(11). (b) Broadcasting. (c) As per treatments. 
(d) and (e) N.A. 
(v) Nil for 63(28): 44.8 Kg/ha. of N and 44.8 Kg/ha. of P₂O₅ for 64(14); 22.4 Kg/ha. of N and 44.8 Kg/ha. of P₂O₅ for 65(11). (vi) and (vii) As per treatments. 
Type: - 'ICV'.

2. TREATMENTS:
Main-plot treatments:
4 irrigation schedule: 
I₁ = Standing water, I₂ = Irrigations when ever necessary to keep field wet, I₃ = Irrigation after keeping field dry for 3 days and I₄ = Irrigation after keeping field dry for 6 days.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 varieties: V₁ = Basmati and V₂ = N.P. - 130.
(2) 3 seed rates: S₁ = 44.8, S₂ = 89.7 and S₃ = 134.5 Kg/ha.
4. GENERAL:
(i) Good for 63(28); Normal for 64(14) and 65(11). (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1963 to 1965. (b) No. (c) Nil. (v) N.A. (vi) Heavy rain fall during flowering and maturity for 63(28). (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5.

5. RESULTS:

63(28)
(i) 2725 Kg/ha. (ii) (a) 874.0 Kg/ha. (b) 340.0 Kg/ha. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for V marginal means = 161.9 Kg/ha.

64(14)
(i) 2009 Kg/ha. (ii) (a) 796.0 Kg/ha. (b) 581.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for V marginal means = 161.9 Kg/ha.

65(11)
(i) 2050 Kg/ha. (ii) (a) 700.9 Kg/ha. (b) 479.0 Kg/ha. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for V marginal means = 228.4 Kg/ha.
Crop :- Paddy *(Kharif).*  
Site :- Irrigation. Res. Centre, Kota.  
Object :- To work out different water regimes, nitrogen and weeding treatments suitable for drilled Paddy.

1. BASAL CONDITIONS :  
(i) (a) Nil.  (b) Linseed.  (c) Nil.  (ii) Heavy clay soil.  (iii) 1.8.1964.  (iv) (a) 3 ploughings.  (b) Drilling in rows.  (c) N.A.  (d) 30 cm. x 10 to 15 cm.  (e) N.A.  (v) 44.8 Kg/ha. of $P_2O_5$.  (vi) N.P.--130.  (vii) and (viii) As per treatments.  (ix) 72 cm.  (x) 15.10.1964.

2. TREATMENTS :  
All combinations of (1), (2) and (3)  
(1) 3 irrigation schedules : $I_1$=Rainfall only, $I_1$=60% available moisture and $I_2$=Field capacity.  
(2) 3 weeding schedules : $W_0$=No weeding. $W_1$=Cultural weeding by hand implement and $W_2$=Chemical weeding (3–4. D.P.A.)  
(3) 3 levels of $N$ : $N_0=0$, $N_1=44.8$ and $N_2=89.7$ Kg/ha.

3. DESIGN :  
(i) $3^n$ confd.  (ii) (a) 9 plots/block, 3 blocks/replieation.  (b) N.A.  (iii) 2.  (iv) (a) 10.7 m. x 7.6 m.  (b) 9.8 m. x 6.7 m.  (v) 46 cm. x 46 cm.  (vi) Yes.

4. GENERAL :  
(i) Satisfactory.  (ii) Nil.  (iii) Growth observations and yield of grain.  (iv) (a) 1°64--990.  (b) No.  (c) Nil  
(v) to (vii) Nil.

5. RESULTS :  
(i) 1514 Kg/ha.  (ii) 2310 Kg/ha.  (iii) All effects except main effect of $W$ are highly significant.  (iv) Av. yield of grain in Kg/ha.

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<td>1558</td>
<td>341</td>
<td>1613</td>
<td>2589</td>
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</table>

C.D. for N or I marginal means=159.5 Kg/ha.  
C.D. for body of any table =276.5 Kg/ha.

Crop :- Wheat *(Rabi).*  
Site :- Govt. Agri. Farm, Bassi.  
Object :- To study the effect of different levels of N and P on the yield of Wheat.

1. BASAL CONDITIONS :  
(i) (a) Fallow-Wheat.  (b) Fallow.  (c) Nil.  (ii) Sandy loam. (iii) 19.11.1964.  (iv) (a) 4 ploughings with tractor drawn mould board and disc plough. (b) Line sowing. (c) 90 Kg/ha. (d) 23 cm. x 8 cm. (e) N.A.  
(v) 33.6 Kg/ha. of $K_2O$.  (vi) R.S. 31--1.  (vii) Irrigated.  (viii) 1 weeding with Khurfi.  (ix) Nil.  (x) 8.4.1965.
1. **TREATMENTS**:  
All combinations of (1) and (2)  
(1) 4 levels of N as A/S: N₀ = 0, N₁ = 33.6, N₂ = 67.3 and N₃ = 100.9 Kg/ha.  
(2) 4 levels of P₂O₅ as Super: P₀ = 0, P₁ = 33.1, P₂ = 67.3 and P₃ = 100.9 Kg/ha.  
N broadcast 1/4 at sowing and 1/4 at first irrigation and P applied by drilling.

3. **DESIGN**:  
(i) 4² confd. (ii) (a) 4 plots/block, 4 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 7.3 m. x 5.5 m. (b) 6.4 m. x 5.0 m. (v) 46 cm. x 23 cm. (vi) Yes.

4. **GENERAL**:  
(i) N.A. (ii) Nil. (iii) Yield of grain fodder. (iv) (a) 1964 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. **RESULTS**:  
(i) 3078 Kg/ha. (ii) 101.0 Kg/ha. (iii) Main effect of N and (N x P) interaction are highly significant. Main effect of P is significant. (iv) Av. yield of grain in Kg/ha.

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<td>3343</td>
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C.D. for N or P marginal means = 107.0 Kg/ha.  
C.D. for body of N x P table = 214.1 Kg/ha.

---

**Crop**: Wheat *(Rabi)*  
**Site**: Govt. Agri. Farm, Bassi.  
**Ref**: Rj. 60(50).  
**Type**: ‘M’.

Object: To study the effect of different levels of N, P and different sources of N on Wheat.

1. **BASAL CONDITIONS**:  
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 30.10,1960. (iv) (a) 9 ploughings. (b) Drilling. (c) 92 Kg/ha. (d) Between rows 23 cm. (e) N.A. (v) 5604 Kg/ha. of F.Y.M. (vi) R.S. 31-1. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 26.4; 1961.

2. **TREATMENTS**:  
All combinations of (1), (2) and (3) with 3 extra treatments per block  
(1) 3 sources of N: S₁ = A/S, S₂ = A/S/N and S₃ = Urea.  
(2) 3 levels of N: N₀ = 0, N₁ = 22.4 and 44.8 Kg/ha.  
(3) 3 levels of P₂O₅ as Super: P₀ = 0, P₁ = 22.4 and P₃ = 44.8 Kg/ha.  
Extra treatments: E₁ = M + 44.8 Kg/ha. of N as A/S of K₂O; E₂ = M + 44.8 Kg/ha. of N as A/S/N and E₃ = M + 44.8 Kg/ha. of N as Urea.  
M = 44.8 Kg/ha. of P₂O₅ as Super + 22.4 Kg/ha. of K₂O as Mar. Pot.

3. **DESIGN**:  
(i) 3² confd. (ii) (a) 12 plots/block, 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. **GENERAL**:  
(i) Good: (ii) No. (iii) Yield of grain: (iv) (a) 1960 only. (b) and (c) —. (v) to (vii) N.A.
5. RESULTS:
(i) 2074 Kg/ha. (ii) 429·1 Kg/ha. (iii) Main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

\[ E_1 = 2466, E_2 = 2452 \text{ and } E_3 = 2337 \text{ Kg/ha.} \]

![](image)

C.D. for N marginal means = 440·6 Kg/ha.

**Crop :** Wheat (Rabi).  
**Ref :** Rj. 64(78).  
**Site :** Govt. Agri. Farm, Bassi.  
**Type :** ‘M’.

Object : To study the effect of micronutrients applied alone and in combinations on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) 24·7 C.L/ha. of F.Y.M. (ii) Sandy loam. (iii) 1·12.64. (iv) (a) 4 ploughings with tractor disc plough, 1 planking, 2 ploughings with disc plough and planting, (b) Line sowing. (c) 89 Kg/ha. (d) 23 cm. between lines. (e) N.A. (v) 44·8 Kg/ha. of N as A/S by broadcast, 44·8 Kg/ha. of P_2O_5 as Super by dressing and 22·4 Kg/ha. of K_2O by broadcast. (vi) R.S. 31-1. (vii) Irrigated. (viii) 2 hand weedicings. (ix) N.A. (x) 10 to 12.4.1965.

2. TREATMENTS:
All combinations of (1), (2), (3), (4) and (5)
(1) 3 levels of Fe. Sui.: F₀ = 0, F₁ = 9·0 and F₂ = 17·9 Kg/ha.
(2) 3 levels of Mn. Sui.: M₀ = 0, M₁ = 9·0 and M₂ = 17·9 Kg/ha.
(3) 3 levels of Cu. Sui.: C₀ = 0, C₁ = 9·0 and C₂ = 17·9 Kg/ha.
(4) 3 levels of Borax : B₀ = 0, B₁ = 9·0 and B₂ = 17·9 Kg/ha.
(5) 3 levels of Zn. Sui.: Z₀ = 0, Z₁ = 9·0 and Z₂ = 17·9 Kg/ha.
Treatments applied by broadcast.

3. DESIGN:
(i) 3² confd. fractional replication. (ii) (a) 9 plots/block, 9 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 9·2 m. x 5·5 m. (b) 7·4 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Incidence of white ants. (iii) Yield of grain and fodder. (iv) (a) 1964 only. (b) —. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2031 Kg/ha. (ii) 481·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
Crop: Wheat (Rabi).
Site: Govt. Agri. Farm, Bassi.
Object: To study the effect of Gypsum on the yield of Wheat in saline and alkaline land.

1. BASAL CONDITIONS:
(i) (a) No. (b) Zeera for 60(46); Fallow for 61(53). (c) Nil. (ii) Sandy loam with saline patches. (iii) 15.11.1960; 23.11.1961. (iv) (a) 9 to 11 ploughings. (b) Drilling. (c) 92 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) R.S.—81—1. (vii) Irrigated. (viii) 1 to 2 weedings. (ix) N.A. (x) 2.4.1961; 3.4.1962.

2. TREATMENTS:
12 manurial treatments: $M_0$ =Control, $M_1$ =50 Q/ha. of Gypsum in May—June, $M_2$ =100 Q/ha. of Gypsum in May—June, $M_3$ =251 Q/ha. of F.Y.M. in May—June, $M_4$ =251 Q/ha. of F.Y.M. in October. $M_5$ =50 Q/ha. of Agremone Maxicana in May—June, $M_6$ =100 Q/ha. of Agremone Maxicana in May—June, $M_7$ =50 Q/ha. of Gypsum +251 Q/ha. of F.Y.M., $M_8$ =33.6 Kg/ha. of N as A/S+33.6 Kg/ha. of P,O$_5$ as Super, $M_9$ =$M_7$ +50 Q/ha. of Gypsum +251 Q/ha. of F.Y.M., $M_{10}$ =$M_8$ +50 Q/ha. of Gypsum +251 Q/ha. of F.Y.M.

3. DESIGN:
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 3. (iv) (a) 9'2 m. x 5'5 m. (b) 7'4 m. x 3'7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. for 60(46); Attack of white ants for 61(53). (iii) Yield of grain and fodder. (iv) (a) 1960 to 61. (b) N.A. (c) Results of combined analysis given under 5. (v) and (vi) N.A. (vii) Error variances are homogeneous and Treatments x years interaction are absent.

5. RESULTS:
(i) 2706 Kg/ha. (ii) 410-4 Kg/ha. (based on 55 d.f. made up of Treatments x years interaction and pooled error). (iii) Treatment differences are highly significant. ($p$<0.01). (iv) $\bar{Y}$: yield of grain in Kg/ha.
Crop :- Wheat (Rabi).  
Site :- Govt. Agri. Farm, Bassi.  
Object :- To study the effect of Gypsum, F.Y.M., A.S and Super on growth of Wheat in saline and alkaline lands.

1. BASAL CONDITIONS :
   (i) (a) Nil, (b) Fallow. (c) Nil. (ii) Saline and alkaline lands. (iii) 5.11.60 ; 9.11.1961. (iv) (a) 7 to 10 ploughings. (b) Drilling. (c) 92 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) R.S. 31—1. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 28.3.1961 ; 2.4.1962.

2. TREATMENTS :
   10 manurial treatments:  
   $M_0$ = Control, $M_1 = 251$ Q/ha. of F.Y.M. in May, $M_2 = 251$ Q/ha. of F.Y.M. in October, $M_3 = 50$ Q/ha. of Gypsum +251 Q/ha. of F.Y.M., $M_4 = 100$ Q/ha. of Gypsum+251 Q/ha. of F.Y.M., $M_5 = 150$ Q/ha. of Gypsum+251 Q/ha. of F.Y.M., $M_6 = 224$ Kg/ha. of N as A/S +33.6 Kg/ha. of P$_2$O$_5$ as Super, $M_7 = M_6 + M_4$, $M_8 = M_6 + 100$ Q/ha. of Gypsum and $M_9 = 100$ Q/ha. of Gypsum.

3. DESIGN:  
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 2. (iv) 9'2 m. x 7'3 m. (b) 7'4 m. x 5'5 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:  
   (i) Good for 60(45); Germination was poor for other. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1960 to 1961. (b) N.A. (c) Results of combined analysis given under 5. (v) and (vi) N.A. (vii) Error variances are homogeneous Treatments x years interaction is absent.

5. RESULTS:  
   (i) 1898 Kg/ha. (ii) 760.0 Kg/ha. (based on 27 d.f. made up of pooled error and Treatments x years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Crop :- Wheat (Rabi).  
Site :- Govt. Agri. Farm, Bassi.  
Object :- To study the effect of different levels of N, P, K and different sources of N on the yield of Wheat.

1. BASAL CONDITIONS:  
   (i) (a) Nil. (b) Fellow ; N.A. (c) Nil. (ii) Sandy loam. (iii) 14.11.61 ; N.A. (iv) (a) 6 to 8 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) Between rows 23 cm. (e) N.A. (v) N.A. (vi) R.S. 31—1. (vii) Irrigated. (viii) 1—2 weedings. (ix) N.A. (x) 6.4.62 ; N.A.
2. TREATMENTS:

Main-plot treatments:

All combinations of (1) and (2) with one control
(1) 2 levels of N: \( N_1 = 33.6 \) and \( N_2 = 67.3 \) Kg/ha.
(2) 4 sources of N: \( S_1 = A/S, S_2 = A/S/N, S_3 = Urea \) and \( S_4 = C/A/N \).

Sub-plot treatments:

All combinations of (1) and (2)
(1) 2 levels of \( P_2 \) as Super: \( P_2 = 0 \) and \( P_1 = 33.6 \) Kg/ha.
(2) 2 levels of \( K_2 \) as Mur. Pot.: \( K_2 = 0 \) and \( K_1 = 33.6 \) Kg/ha.

3. DESIGN:

(i) Split-plot.  (ii) (a) 9 main-plots/replication, 4 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 7.4 m. \( \times \) 5.5 m.  (b) 6.5 m. \( \times \) 4.6 m.  (v) 45 cm. \( \times \) 45 cm.  (vi) Yes.

4. GENERAL:

(i) Normal.  (ii) Attack of white ants; N.A.  (iii) Yield of grain.  (iv) (a) N.A.  (b) No.  (c) Nil.  (v) and (vi) Nil.  (vii) Yield of “no nitrogen with PK” treatments for the year 1963 is not available. Hence the results of individual years are presented.

5. RESULTS:

61(170)

(i) 2316 Kg/ha.  (ii) (a) 3125 Kg/ha.  (b) 2460 Kg/ha.  (iii) Main effects of N and P are significant.  (iv) Av. yield of grain in Kg/ha.

Without Nitrogen

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<th>( K_0 )</th>
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With Nitrogen

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C.D. for N marginal means = 113.9 Kg/ha.
C.D. for P marginal means = 86.7 Kg/ha.

63(16)

(i) 2592 Kg/ha.  (ii) (a) 4100 Kg/ha.  (b) 2780 Kg/ha.  (iii) Main effects of N, P and interaction N x P are highly significant.  (iv) Av. yield of in grain in Kg/ha.
Crop: Wheat (Rabi).
Site: Govt. Agri. Farm, Bilara.
Ref: Rj. 60(52), 61(59), 61(60).
Type: -'M'.

Object: To study the effect of Agremone maxicana and F.Y.M. on the saline and alkaline lands.

1. BASAL CONDITIONS.
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Saline and alkaline lands. (iii) 10.10.60; 11.11.60; 3.12.61; 8.12.61. (iv) (a) 4 to 8 plantings. (b) Nil. for 60(52); Drilling for cutters. (c) 23 cm. between rows. (d) N.A. (e) N.A. (f) 718.

2. TREATMENTS:
   7 manurial treatments: M<sub>1</sub> = Control, M<sub>1</sub> = 25 Q/ha. of *Agremone maxicana*, M<sub>3</sub> = 75 Q/ha. of *Agremone maxicana*, M<sub>4</sub> = 67.2 Q/ha. of Sesbania (G.M.), M<sub>5</sub> = 125 Q/ha. of F.Y.M., M<sub>6</sub> = 251 Q/ha. of F.Y.M. and M<sub>7</sub> = 33.6 Kg/ha of N as A.S. + 73.6 Kg/ha of P<sub>2</sub>O<sub>5</sub> as Super.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 9·2 m. x 5·5 m. (b) 7·4 m. x 5·7 m. (v) N.A.

4. GENERAL:
   (i) N.A. for 60(52); Good for others. (ii) N.A. for 60(52); Nil for others. (iii) Yield of grain and fodder. (iv) 1960 to 1961. (b) N.A. (c) Results of combined analysis given under 5. (v) and (vi) N.A. (vii) Error variances are heterogeneous and Treatments x years interaction is present.

5. RESULTS:
   (i) 1744 Kg/ha. (ii) 503·0 Kg/ha. (based on 12 d.f. made up of Treatments x years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<th>Treatment</th>
<th>M&lt;sub&gt;6&lt;/sub&gt;</th>
<th>M&lt;sub&gt;1&lt;/sub&gt;</th>
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<td>1870</td>
<td>1481</td>
<td>1721</td>
<td>1822</td>
<td>1775</td>
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</table>

C.D. for N marginal means = 149·4 Kg/ha.
C.D. for P marginal means = 97·9 Kg/ha.
C.D. for P means at the same level of N = 138·6 Kg/ha.
C.D. for N means at the same level of P = 175·0 Kg/ha.
Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Bilara.
Object :- To study the effect of Gypsum for reclamation of saline and alkaline land on the growth of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Saline alkaline. (iii) 4.11.1960 and 6.12.1961. (iv) (a) 8 to 9 ploughings for 60(51), 4 ploughings for the other. (b) Drilling. (c) 90 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) N.P.—718. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 3.4.1961 and 15.4.1962.

2. TREATMENTS:

10 manurial treatments : M_0 = Control, M_1 = 251 Q/ha. of F.Y.M. in June, M_2 = 251 Q/ha. of F.Y.M. in October, M_3 = 50 Q/ha. of Gypsum+251 Q/ha. of F.Y.M., M_4 = 100 Q/ha. of Gypsum+251 Q/ha. of F.Y.M., M_5 = 150 Q/ha. of Gypsum+251 Q/ha. of F.Y.M., M_6 = 224 Kg/ha. of N as A/S + 336 Kg/ha. of P_2O_5 as Super, M_7 = 224 Kg/ha. of N as A/S + 336 Kg/ha. of P_2O_5 as Super + 100 Q/ha. of Gypsum and M_8 = 100 Q/ha. of Gypsum.

3. DESIGN:

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 9·2 m. x 7·3 m. (b) 7·4 m. x 5·5 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:

(i) N.A. for 60(51), Good for 61(57). (ii) N.A. for 60(51), Nil for other. (iii) Yield of grain and fodder. (iv) (a) 1960 to 1961. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) The error variances are heterogeneous and the Treatments x years interaction is absent, therefore the results of individual years are presented under 5.

5. RESULTS:

60(51)

(i) 1491 Kg/ha. (ii) 341·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
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<td>1941</td>
<td>1529</td>
<td>1371</td>
<td>1553</td>
<td>1103</td>
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</tbody>
</table>

C.D. = 223·4 Kg/ha.

61(57)

(i) 1850 Kg/ha. (ii) 130·3 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<tr>
<th>Treatment</th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>M_4</th>
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<th>M_6</th>
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<td>1697</td>
<td>1760</td>
<td>1859</td>
<td>2158</td>
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<td>1946</td>
<td>2095</td>
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C.D. = 1889 Kg/ha.

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Bilara.
Object :- To study the effect of Gypsum through saline water on the yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow for 61(61), Wheat for 61(62). (c) Nil. (ii) Saline and alkaline land. (iii) 7.12.1961, N.A. (iv) (a) 4 to 5 ploughings. (b) Drilling. (c) 92 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) N.P. 718. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 13.4.1962, 15.4.1962.
2. TREATMENTS:
7 manurial treatments: M₀ = Control, M₁ = 50 Q/ha. of Gypsum, M₂ = 50 Q/ha. of F.Y.M., M₃ = M₁ + M₂, M₄ = 67·2 Kg/ha. of Sesbania seed for G.M., M₅ = Water through at 50 Q/ha. of Gypsum an M₆ = Water through at 50 Q/ha. of F.Y.M.

3. DESIGN:
(i) R.B.D. (ii) a·t·. (b) N.A. (iii) 3. (iv) (a) 9·2 m. x 5·5 m. (b) 7·4 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1961 only. (b) N.A. (c) Results of combined analysis given under 5. Results. (v) and (vi) N.A. (vii) Two experiments conducted during the year. Error variances are homogeneous, Treatments x years interaction is present.

5. RESULTS:
(i) 1688 Kg/ha. (ii) 214·8 Kg/ha. 6 d.f. made up of interaction of treatments with years]. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

**Crop:** Wheat (**Rabi**).

**Site:** Govt. Agri. Farm, Bilara.

**Ref:** Rj. 61(58).

**Type:** 'M'.

Object: To study the effect of Gypsum, F.Y.M. and artificial fertilizers on saline and alkaline lands for Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Saline and alkaline land. (iii) 7·12·61. (iv) (a) 5 ploughings. (b) Drilling (c) 92 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) N.P. 718. (vii) Irrigated. (viii) 1 weedmg. (ix) N.A. (x) 13·4·62.

2. TREATMENTS:
10 manurial treatments: M₀ = Control, M₁ = 251 C/ha. of F.Y.M. in June, M₂ = 50 Q/ha. of Gypsum : 251 Q/ha. of F.Y.M., M₃ = 44·8 Kg/ha. of N as A/S + 33·6 Kg/ha. of P₂O₅ as Super, M₄ = 44·8 Kg/ha. of N as A/S + 33·6 Kg/ha. of P₂O₅ as Super + 251 Q/ha. of F.Y.M., M₅ = 44·8 Kg/ha. of N as A/S + 33·6 Kg/ha. of P₂O₅ as Super + 251 Q/ha. of F.Y.M. + 50 Q/ha. of Gypsum, M₆ = 502 Q/ha. of F.Y.M., M₇ = 502 Q/ha. of F.Y.M. + 50 Q/ha. of Gypsum, M₈ = 502 Q/ha. of F.Y.M. + 44·8 Kg/ha. of P₂O₅ as Super + M₉ = 502 Q/ha. of F.Y.M. + 44·8 Kg/ha. of N as A/S + 33·6 Kg/ha. of P₂O₅ as Super - 50 Q/ha. of Gypsum.

3. DESIGN:
(i) R.B.D. (ii) a·t·. (b) N.A. (iii) 3. (iv) (a) 9·2 m. x 5·5 m. (b) 7·4 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1961 only. (b) and (c) Nil. (v) (vi) Nil.

5. RESULTS:
(i) 1688 Kg/ha. (ii) 214·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

**Crop:** Wheat (**Rabi**).

**Site:** Govt. Agri. Farm, Bilara.

**Ref:** Rj. 61(58).

**Type:** 'M'.

Object: To study the effect of Gypsum, F.Y.M. and artificial fertilizers on saline and alkaline lands for Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Saline and alkaline land. (iii) 7·12·61. (iv) (a) 5 ploughings. (b) Drilling (c) 92 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) N.P. 718. (vii) Irrigated. (viii) 1 weedmg. (ix) N.A. (x) 13·4·62.

2. TREATMENTS:
10 manurial treatments: M₀ = Control, M₁ = 251 C/ha. of F.Y.M. in June, M₂ = 50 Q/ha. of Gypsum : 251 Q/ha. of F.Y.M., M₃ = 44·8 Kg/ha. of N as A/S + 33·6 Kg/ha. of P₂O₅ as Super, M₄ = 44·8 Kg/ha. of N as A/S + 33·6 Kg/ha. of P₂O₅ as Super + 251 Q/ha. of F.Y.M., M₅ = 44·8 Kg/ha. of N as A/S + 33·6 Kg/ha. of P₂O₅ as Super + 251 Q/ha. of F.Y.M. + 50 Q/ha. of Gypsum, M₆ = 502 Q/ha. of F.Y.M., M₇ = 502 Q/ha. of F.Y.M. + 50 Q/ha. of Gypsum, M₈ = 502 Q/ha. of F.Y.M. + 44·8 Kg/ha. of P₂O₅ as Super + M₉ = 502 Q/ha. of F.Y.M. + 44·8 Kg/ha. of N as A/S + 33·6 Kg/ha. of P₂O₅ as Super - 50 Q/ha. of Gypsum.

3. DESIGN:
(i) R.B.D. (ii) a·t·. (b) N.A. (iii) 3. (iv) (a) 9·2 m. x 5·5 m. (b) 7·4 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1961 only. (b) and (c) Nil. (v) (vi) Nil.

5. RESULTS:
(i) 1688 Kg/ha. (ii) 214·8 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

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<th>M₃</th>
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C.D. = 224·8 Kg/ha.
Crop : Wheat (Rabi).

Site : Govt. Seed Multiplication Farm, Bhilwara.

Object : To study the effect of different methods of application of N on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Sanai-Wheat. (b) Sanai. (c) 44-8 Kg/ha. of P₂O₅. (ii) Slightly alkaline-loam. (iii) 18.11.65.
   (iv) (a) 4 ploughings. (b) N.A. (c) 100 Kg/ha. (d) Between lines 30 cm. (e) N.A. (f) 40 Kg/ha. of P₂O₅
   (vi) N.P. 718 (medium). (vii) Irrigated. (viii) 1 hand weeding. (ix) N.A. (x) 23, 24.3.

2. TREATMENTS:

   Main-plot treatments:
   12 methods of application:
   M₁ = basal as broadcast + ½ top dressing at first irrigation; M₂ = broadcast before sowing + ½ drilled at first irrigation; M₃ = drilled with seed + ½ drilled at first irrigation; M₄ = drilled before seed + ½ top dressing at first irrigation.
   M₅ = drilled before seed + ½ drilled at first irrigation; M₆ = drilled with seed + ½ drilled at first irrigation;
   M₇ = broadcast + ⅔ top dressing at first irrigation; M₈ = broadcast before sowing + ⅔ drilled at first irrigation;
   M₉ = drilled with seed + ⅔ drilled at first irrigation; M₁₀ = drilled before seed + ⅔ top dressing at first irrigation;
   M₁₁ = drilled before seed + ⅔ drilled at first irrigation.

   Sub-plot treatments:
   3 levels of N: N₁ = 45, N₂ = 90 and N₃ = 135 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 12 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 5 m x 3 m.
   (b) 4 m x 2 m. (v) 50 em. x 50 em. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and other biometric data. (iv) (a) 1965—contd.. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1568 Kg/ha. (ii) (a) 892.6 Kg/ha. (b) 315.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

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Crop:- Wheat (Rabi).
Ref:- Rj. 60(75), 61(92).
Site:- Govt. Agri. Res. Farm, Borkhera.
Type:- 'M'.

Object: - To study the effect of G.M. on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) G.M.—Wheat for 60(75), N.A. for 61(92), (b) G.M. (c) N.A. (ii) Medium clay soil. (iii) 7.11.60 for 60(75): N.A. for 61(92). (iv) (a) 2 to 3 ploughings and 2 bakharings. (b) N.A. (c) 92 Kg/ha, for 60(75); 69 Kg/ha, for 61(92). (d) Row to Row 30 cm. (e) N.A. (v) N.A. (vi) N.P.718. (vii) Irrigated (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of Molybdenium: M₀=0 and M₁=1 Kg/ha.
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 4 G.M. crops: G₀=Control, G₁=Sandi, G₂=Gowar and G₃=Cowpea.
   (2) 3 levels of P₀₂ as Super: P₀=0, P₁=33.6 and P₂=67.2 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots replication, 12 sub-plots/main-plots. (b) N.A. (iii) 3 for 60(75), 4 for 61(92). (iv) (a) 8.0 m. x 5.5 m. (b) 7.8 m. x 4.6 m. (v) 30 cm. x 46 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960 to 1961. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Error variances for sub-plots are heterogeneous therefore results of individual years are presented under 5 Results.

5. RESULTS:

60(75)

   (i) 1745 Kg/ha. (ii) (a) 106.9 Kg/ha. (b) 553.3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<th>G₂</th>
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61(92)

   (i) 1434 Kg/ha. (ii) (a) 83.1 Kg/ha. (b) 184.1 Kg/ha. (iii) Main effects of G and P are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>G₀</th>
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Crop: Wheat (Rabi).

Site: Govt. Agri. Res. Farm, Borkhera.

Type: M.

Object: To find out the efficiency of foliar application of different sources and levels of N at different stages of growth of wheat.

1. BASAL CONDITION:
   - (i) Nil for 61(97) and 64(42) Sugarcane-Fallow-Wheat for 62(57).
   - (b) Fallow for 61(97) and 64(42), Sugarcane for for 62(57).
   - (c) Nil.
   - (ii) Medium clay soil.
   - (iv) (a) 2 ploughings and 3 bakherings for 61(97), Cross discs and 1 bakhering for 61(57), One ploughing, cross tillering and planting for 64(42).
   - (b) Drilling.
   - (c) 69 Kgf/ha. for 61(97), 92 Kgf/ha. for others.
   - (d) 30 em. between rows.
   - (e) N.
   - (v) 11·2 Kg/ha. of N for 61(97), 62(57), 44·8 Kg/ha. of P, was applied by drilling for 64(42).
   - (vi) NP-718.
   - (vii) Irrigated.
   - (viii) 2 weedings for 61(97), 62(57), 1 hoeing for 64(42).
   - (ix) N.A.
   - (x) N.A. for 61(97), 2.4.1563, 23.3.1965.

2. TREATMENTS:
   All combinations of (1), (2) and (3).
   - (1) 4 sources of N: S₁ = Urea, S₂ = A/S, S₃ = A/S/N and S₄ = C/A/N.
   - (2) 4 levels of N: N₁ = 11·2, N₂ = 22·4, N₃ = 33·6 and N₄ = 44·8 Kg/ha.
   - (3) 3 stages of foliar application of N: T₁ = At early tillering, T₂ = At late tillering and T₃ = At flowering stage.

8 extra treatments applied in 61(97) which are given below.
E₀ = control, E₁ = 22·4 Kg/ha. of N as Urea; E₂ = 22·4 Kg/ha. of N as A/S, E₃ = 22·4 Kg/ha. of N as A/S/N, E₄ = 22·4 Kg/ha. of N as C/A/N, E₅ = No fertilizer, E₆ = Only water sprayed, E₇ = Fertilizer and water spray.

3. DESIGN:
   (i) Fact. in R.B.D. for 61(97), 4² x 3 Fact. for others. (ii) (a) 56 for 61(97); 12 plots/block and 4 blocks/repli for others. (b) N.A. (iii) 4 for 61(97), 3 for others. (iv) (a) 4·6 m. x 3·0 m. for 61(97), 6·1 m. x 4·3 m. for others. (b) 4·0 m. x 2·7 m. for 61(97), 5·5 m. x 3·7 m. for others. (v) 30 em. x 15 cm. for 61(97), 30 cm. x 30 cm. for others. (vi) Yes.

4. GENERAL:
   (i) N.A. for 61(97); good for others. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1961 to 1964 (Expt for 1963 N.A.) (b) No. (v) N.A. (vi) Nil. (vii) Combined results of expt. No. 62(57), 64(42) and individual year results of expt No. 61(97) are presented under results. Error variances for two years are homogeneous and Treatments x years interaction is presented.

5. RESULTS:
   (i) 1724 Kg/ha. (ii) 925·9 Kg/ha. (29 d.f. made up of interaction of various components of treatments with years.) (iii) Main effects of T and N are highly significant and that of S is significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for T marginal means = 273.3 Kg/ha.
C.D. for S or N marginal means = 315.5 Kg/ha.

(i) 2268 Kg ha.  (ii) 294.4 Kg/ha.  (iii) Interaction N × T alone is highly significant.  (iv) Av. yield of grain in Kg ha.

\[ F_s = 1081, E_1 = 1449, E_2 = 1495, E_s = 1345, E_2 = 1299, E_1 = 1311 \text{ and } E_2 = 1219 \text{ Kg/ha.} \]

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>N1</th>
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C.D. for the body of N × T table = 117.8 Kg/ha.

---

**Crop:** Wheat (*Rabi*).  
**Site:** Govt. Agri, Res. Farm, Borkhera.  
**Ref:** Rj. 62(88), 63(59).  
**Type:** 'M'.

Object: To find out the suitability of wheat transplanting under different fertility levels and application of N through organic and organic manures.

1. **BASAL CONDITIONS:**
   (i) (a) Nil.  (b) Fallow for 62(88); Cotton for 63(59).  (c) Nil for 62(88); 44.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub> for 63(59)
   (ii) Medium clay soil.  (iii) 21.1.1963; 22.1.1964,  (iv) (a) 2 bakherings, 2 weedicings with disc harrow and 1 planting with patota for 62(88); 1 ploughing, 1 discing and 1 planking for 63(59).  (b) Transplanting.  (c) 20 Kg/ha.  (d) 30 cm. between lines.  (e) 3.  (v) Nil.  (vi) NP—718.  (vii) Irrigated.  (viii) 1 hoeing  (ix) Nil for 62(88); 140.4 cm. for 63(59).  (x) 8.5.1963; 23.4.1964.

2. **TREATMENTS:**
   **Main-plot treatments:**
   3 levels of fertilizers: F<sub>1</sub> = 22.4 Kg ha. of N +11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> +11.2 Kg/ha. of K<sub>2</sub>O, F<sub>2</sub> = 44.8 Kg/ha. of N +22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> +22.4 Kg/ha. of K<sub>2</sub>O and F<sub>3</sub> = 67.2 Kg/ha. of N +44.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub> +44.8 Kg/ha. of K<sub>2</sub>O.
   N as A/S, P<sub>2</sub>O<sub>5</sub> as Super K<sub>2</sub>O applied as Pot. Sul.
   **Sub-plot treatments:**
   7 sources of N: M<sub>1</sub> = 100% in organic, M<sub>2</sub> = 50% F.Y.M.+50% inorganic, M<sub>3</sub> = 50% oil cake+50% in organic, M<sub>4</sub> = 25% F.Y.M.+25% oil cake+50% inorganic, M<sub>5</sub> = 25% F.Y.M.+75% inorganic, M<sub>6</sub> = 25% oil cake+75% inorganic, and M<sub>7</sub> = 12.5% F.Y.M.+12.5% oil cake+75% inorganic.

3. **DESIGN:**
   (i) Split-plot.  (ii) (a) 3 main-plots/replication, 7 sub-plots/main-plot.  (b) N.A.  (iii) 2.  (iv) (a) 3 × 7 m.  (b) 3 × 18 m.  (c) 30 cm × 30 cm.  (vi) Yes.

4. **GENERAL:**
   (i) Normal.  (ii) Nil.  (iii) Yield of grain and fodder.  (iv) (a) 1962—1963.  (b) No.  (c) Nil.  (v) N.A.  (vi) Nil.  (vii) Since the sub-plot error variances are heterogeneous, the results of individual years are presented under 5 Results.
5. RESULTS:

62(68)

(i) 1452 Kg/ha. (ii) (a) 135/4 Kg/ha. (b) 189·1 Kg/ha. (iii) Main effects of F and M are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
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<td>948</td>
<td>1332</td>
<td>1988</td>
<td>1102</td>
<td>1571</td>
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</tbody>
</table>

C.D for F marginal means = 218·6 Kg/ha.
C.D for M marginal means = 229·2 Kg/ha.

63(59)

(i) 1151 Kg/ha. (ii) (a) 35·8 Kg/ha. (b) 67·1 Kg/ha. (iii) Main effects of F and M are highly significant and interaction F×M is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
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<td>806</td>
<td>1029</td>
<td>1558</td>
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</table>

C.D for F marginal means = 58·1 Kg/ha.
C.D for M marginal means = 81·5 Kg/ha.
C.D for M means at the same level of F= 133·6 Kg/ha,
C.D for F means at the same level of M= 140·0 Kg/ha.

Crop : Wheat (Rabi).

Ref : Rj. 61(105), 63(56)

Site : Govt. Agri. Res. Farm, Borkhera. Type : 'M'.

Object : To study the effect of different levels of N, P and K on the yield of Wheat.

1. BASAL CONDITIONS :

   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Clay Loam. (iii) 18.11.61 ; 2, 3.12.63. (iv) (a) Ploughing and discing. (b) Drilling. (c) 90 Kg/ha. (d) 30 cm × 30 cm. (e) Nil. (f) Nil. (vi) R.S. 31-1. (vii) Irrigated (viii) 2 weedings. (ix) N.A. : 140 cm. (x) 10 to 13.4.62 ; 7, 8.4.64.

2. TREATMENTS :

Main-plot treatments :
All combinations of (1) and (2) with a control.
(1) 4 sources of N : $S₁=A/S, S₂=A/S/N, S₃=Urea and S₄=C/A/N$
(2) 2 levels of N : $N₁=33·6$ and $N₂=67·2$ Kg/ha.

Sub-plot treatments :
All combinations of (1) and (2)
(1) 2 levels of $P₂O₅$ as Super : $P₀=0$ and $P₁=33·6$ Kg/ha.
(2) 2 levels of $K₂O$ as Mur. Pot. : $K₀=0$ and $K₁=33·6$ Kg/ha.
3. DESIGN:
(i) Split-plot. (ii) (a) 9 main-plots/rep., 4 sub-plots/main-plot. (b) N.A., 77.5 m. x 23.8 m. (iii) 3.
(iv) (a) 7.4 m. x 5.5 m. (b) 6.5 m. x 4.6 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A.- (iii) Yield of grain. (iv) (a) 1961 to 1963 [Not conducted in 1962]. (b) No. (c) Nil.
(v) to (vi) Nil. (vii) As the means for (P x K) table under No nitrogen for 6/1(105) is not available, individual results for the two years are presented.

5. RESULTS:

6/1(105)
(i) 2166 Kg/ha. (ii) (a) 285.8 Kg/ha. (b) 270.0 Kg/ha. (iii) Main effects of P and K are significant and that of N is highly significant. (iv) Av. yield of grain in Kg/ha.

Control=1847 Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>P1</th>
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</table>

C.D. for N marginal means=123.6 Kg/ha.
C.D. for P or K marginal means=110.6 Kg/ha.

63(56)
(i) 1564 Kg/ha. (ii) (a) 517.9 Kg/ha. (b) 248.0 Kg/ha. (iii) Main effect of P is highly significant and control vs others in significant. (iv) Av. yield of grain in Kg/ha.

Without nitrogen

<table>
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With nitrogen

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<th>S4</th>
<th>P1</th>
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</table>

C.D. for P marginal means=101.6 Kg/ha.
C.D. for Control vs others=336.8 Kg/ha.
Crop : Wheat (Rabi). 
Site : Janta College Farm, Dabok. 
Ref : Rj. 64(76), 65(37). 
Type : 'M'. 

Object : To study the effect of split-application of different levels of N on Wheat. 

1. BASAL CONDITIONS: 
(i) (a) to (c) N.A. (ii) Loam. (iii) 1.12.1964 ; 2.11.1965. (iv) (a) N.A. (b) Line sowing. (c) 92 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) 44.8 Kg/ha. of P_2O_5 as Super drilled and 44.8 Kg/ha. of K_2O as Mur. Pot. by broadcasting. (vi) NP—718. (vii) Irrigated. (viii) Nil. (ix) N.A. (x) 4, 5.4.1965 ; 2, 3.4.1966. 

2. TREATMENTS: 
All combinations (1) and (2) 
(1) 2 methods of application : M_1 = In two doses and M_2 = In 3 doses. 
(2) 4 levels of N as A/S : N_0 =0, N_1 =44.8, N_2 =89.7 and M_3 =134.5 Kg/ha. 
N applied by broadcast as sowing. 

3. DESIGN: 
(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes. 

4. GENERAL: 
(i) Good. (ii) Spraying of 2, 4—D at 1:1 Kg/ha. of acid equivalent as a precautionary measure for 64(76) ; Nil for 65(37). (iii) Yield of grain and fodder (iv) (a) 1964 to 1965. (b) No. (c) Results of combined analysis given under 5. (v) N.A. (vi) Nil. (vii) Error variances are homogeneous and Treatments x years interaction is absent. 

5. RESULTS: 
(i) 1030 Kg/ha. (ii) 247.4 Kg/ha. (based on 48 d.f. made up of interaction of treatments with years and pooled error). (iii) Control vs. others is highly significant. (iv) Av. yield of grain in Kg/ha. 

<table>
<thead>
<tr>
<th>Control=639 Kg/ha.</th>
<th>N_1</th>
<th>N_2</th>
<th>N_3</th>
<th>Mean</th>
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<tr>
<td>C.D. for control vs. others=203.3 Kg/ha.</td>
<td></td>
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</table>

Crop : Wheat (Rabi). 
Site : Govt. Agri. Farm, Durgapura. 
Ref : Rj. 60(56), 61(78). 
Type : 'M'. 

Object : To study the effect of foliar spray of different levels of N through different sources. 

1. BASAL CONDITIONS: 
(i) (a) N.A. for 60(56); Fallow-Wheat for 61(78). (b) Bajra for 60(56); Fallow for other. (c) N.A. (ii) Sandy loam. (iii) 12.10.1960 ; 5.11.1961. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) 23 cm. between rows. (e) N.A. (v) 24.4 Kg/ha. of N+9223 Kg/ha. of F.Y.M and 413 Kg/ha. of S.A.S. for 60(56); N.A. for 61(78). (vi) R.S. 31-1. (vii) Irrigated. (viii) 2 weeks. (ix) N.A. for 60(56). (x) Nil for 61(78). (x) 27.4.1961 ; 4.4.1962.
2. TREATMENTS:

All combinations of (1), (2) and (3) with 3 extra treatments.

(1) 3 levels of N: \(N_1=11\cdot2\), \(N_2=16\cdot8\) and \(N_3=22\cdot4\) Kg/ha.
(2) 3 sources of N: \(S_1=Urea\), \(S_2=AMS\) and \(S_3=AIN\)
(3) 2 times of application of N: \(T_1=\) Before tillering and \(T_2=\) Just before flowering.

Extra treatments are: \(E_1=\) One water spray before tillering, \(E_2=\) One water spray just before flowering and \(E_3=\) Top dressing.

3. DESIGN:

(i) Fact. R.B.D. (ii) (a) 21. (b) N.A. (iii) 2 for 60(56); 3 for 61(78). (iv) (a) 9·8 m. \times 6·4 m. for 60(56); 5·7 m. \times 3·7 m. for 61(78). (b) 9'1 m. \times 5'9 m. for 60(56); 5'1 m. \times 3'1 m. for 61(78). (v) 30 cm. \times 23 cm. for 60(56); 30 cm. \times 30 cm. for 61(78). (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 to 61. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous and Treatments \times\ years interaction in absent.

5. RESULTS:

60(56)

(i) 1259 Kg/ha. (ii) 233'7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

\[E_1=1174\,1\,E_2=897\,\text{and}\,E_3=1221\,\text{Kg/ha.}\]

\[
\begin{array}{ccc|cc|c}
S_1 & S_2 & S_3 & T_1 & T_2 & \text{Mean} \\
N_1 & 1381 & 1283 & 1468 & 1330 & 1425 & 1378 \\
N_2 & 1305 & 1369 & 1092 & 1262 & 1249 & 1255 \\
N_3 & 1425 & 1228 & 1025 & 1373 & 1079 & 1226 \\
\text{Mean} & 1370 & 1293 & 1195 & 1322 & 1251 & 1286 \\
T_1 & 1309 & 1316 & 1340 & 1399 & 1485 & 2238 \\
T_2 & 1431 & 1271 & 1050 & 2730 & 2770 & 2691 \\
\end{array}
\]

61(78)

(i) 2534 Kg/ha. (ii) 537'7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

\[E_1=1399,\,E_2=1485\,\text{and}\,E_3=2238\,\text{Kg/ha.}\]

\[
\begin{array}{ccc|cc|c}
P_1 & P_2 & P_3 & T_1 & T_2 & \text{Mean} \\
N_1 & 2938 & 2691 & 2562 & 2627 & 2730 & 2730 \\
N_2 & 2757 & 2861 & 2691 & 2863 & 2770 & 2770 \\
N_3 & 2788 & 2572 & 2712 & 2871 & 2511 & 2691 \\
\text{Mean} & 2828 & 2708 & 2655 & 2787 & 2674 & 2730 \\
T_1 & 2928 & 2712 & 2720 & 2730 & 2730 & 2730 \\
T_2 & 2727 & 2705 & 2590 & 2730 & 2730 & 2730 \\
\end{array}
\]

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Dhurgapura.
Object :- To study the effect of different micronutrients on the yield of Wheat.

Ref :- Rj. 64(74).
Type :- 'M'.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Moong. (c) Nil.  (ii) (a) Sandy loam. (iii) 25.11.64. (iv) (a) N.A. (b) Line sowing. (c) 92 Kg/ha. (d) Between lines 25 cm. (e) N.A. (v) 44.8 Kilo of N as A.S and 44.8 Kg/ha. of P.O as Super. (vi) Bet. (vii) N.P. (viii) kharif. (ix) 1 cm. (x) 4 to 7.4.65.

2. TREATMENTS:
   All combinations of (1), (2), (3), (4) and (5).

   (1) 3 levels of Fe as Fe.Sul.: Fe₀=0, Fe₁=9 and Fe₂=18 Kg/ha.
   (2) 3 levels of Mn as Mn Sulf.: Mn₀=0, Mn₁=9 and Mn₂=18 Kg/ha.
   (3) 3 levels of Cu as Cu. Sulf.: Cu₀=0, Cu₁=9 and Cu₂=18 Kg/ha.
   (4) 3 levels of B as Borax. B₀=0, B₁=9 and B₂=18 Kg/ha.
   (5) 3 levels of Zn as Zn. Sulf.: Zn₀=0, Zn₁=9 and Zn₂=18 Kg/ha.

Trace elements applied by broadcast.

3. DESIGN:
   (i) 3rd confd. (fractional replication). (ii) (a) 9 plots/block ; 9 blocks/replcation. (b) N.A. (iii) 9·2 m. x 5·5 m. (b) 7·4 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964 only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1359 Kg/ha. (ii) 207·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

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Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Durgapura.
Object :- To study the effect of N, P and K on quality and yield of grain.
1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Fallow.  (c) Sandy loam.  (iii) 18.11.61.  (iv) (a) 4 ploughings.  (b) Drilling.
   (c) 90 Kg/ha.  (d) Row to row 23 cm.  (e) N.A.  (v) N.A.  (vi) R.S. 31-1.  (vii) Irrigated.  (viii) 3 weeding.
   (ix) N.A.  (x) 3, 4, 4.62.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of P₂O₅ as Super:  P₅=0, P₃=22.4 and P₄=44.8 Kg/ha.
   (2) 2 levels of K₂O as Muri of Pot:  K₅=0 and K₄=22.4 Kg/ha.
   Sub-plot treatments:
   5 manural treatments:  N₀=0, N₁=33.6 Kg/ha of N as A/S in single application, N₂=33.6 Kg/ha of N as A/S in split application, N₃=67.2 Kg/ha of N in single application and N₄=67.2 Kg/ha of N in split application.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 6 main-plots/replication; 5 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 6'7 m. x 4'0 m.  (b) 5'8 m. x 3'1 m.  (v) 46 cm. x 48 cm.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) Nil.  (iii) Yield of grain and fodder.  (iv) to (vii) N.A.

5. RESULTS:
   (i) 1708 Kg/ha.  (ii) (a) 339.0 Kg/ha.  (b) 256.1 Kg/ha.  (iii) Main effect of N alone is highly significant.
   (iv) Av. yield of grain in Kg/ha.

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C.D. for N marginal means=147.5 Kg/ha.

Crop := Wheat (Rabi).
Site := Govt. Agri. Farm, Durgapura.
Object := To study the effect of different levels of N, P and different times of application of fertilizers on Wheat.

1. BASAL CONDITIONS:
   (i) (a) G.M.-Wheat.  (b) G.M.  (c) N.A.  (ii) Sandy loam.  (iii) 12.11.64.  (iv) (a) 3 ploughings.  (b) Line sowing.  (c) 99 Kg/ha.  (d) 23 cm. x 8 cm.  (e) N.A.  (v) G.M.  (vi) R.S. 31-1.  (vii) Irrigated.  (viii) 1 hand hoeing.  (ix) 1'2 cm.  (x) 13.4.65.
2. TREATMENTS:

Main-plot treatments:

- 4 times and methods of application of fertilizers: M<sub>1</sub> = Whole at the time of sowing by broadcasting, M<sub>2</sub> = Whole at the time of sowing by drilling, M<sub>3</sub> = 1/2 N + full P<sub>205</sub> at the time of sowing + N as top dressing and M<sub>4</sub> = 1/2 N + full P<sub>205</sub> at the time of sowing by drilling + N as top dressing.

Sub-plot treatments:

- All combinations of (1) and (2)
  - (1) 3 levels of N: N<sub>0</sub> = 0, N<sub>1</sub> = 33.6, N<sub>2</sub> = 67.2 Kg/ha
  - (2) 3 levels of P<sub>205</sub>: P<sub>0</sub> = 0, P<sub>1</sub> = 33.6, P<sub>2</sub> = 67.2 Kg/ha

3. DESIGN:

- (i) Split-plot. (ii) (a) 4 main-plots/replication, 9 sub-plots/main-plots. (b) N.A. (iii) 3. (iv) (a) 3.7 m. x 2.7 m. (b) 3.1 m. x 2.3 m. (v) 30 cm. x 23 cm. (vi) Yes.

4. GENERAL:

- (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1964 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

- (i) 2158 Kg/ha. (ii) (a) 821.2 Kg/ha. (b) 805.3 Kg/ha. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for N or P marginal means = 379.4 Kg/ha.

Crop: - Wheat (Rabi).

Site: - Govt. Agri. Farm, Hemawas.

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

1. BASAL CONDITIONS:

- (i) (a) Nil. (b) Sman. (c) Nil. (ii) N.A. (iii) 28.11.64. (iv) (a) 3 hoeing cultivations. (b) Line sowing. (c) 92 Kg/ha. (d) Between lines 23 cm. (e) N.A. (v) Nil. (vi) R.S. 31-1. (vii) Irrigated. (viii) 2 hand weedicings and 2 hand hoeings. (ix) N.A. (x) 2.4.65.

2. TREATMENTS:

- All combinations of (1) and (2) with two extra treatments
  - (1) 2 levels of N: N<sub>3</sub> = 33.6 and N<sub>4</sub> = 67.2 Kg/ha.
  - (2) 3 sources of N: S<sub>1</sub> = A/S, S<sub>2</sub> = A/S/N and S<sub>3</sub> = C/A/N.

These plots also receive 33.6 Kg/ha. P<sub>205</sub> as Super.

Extra treatments:

- C<sub>0</sub> = Control and C<sub>1</sub> = 33.6 Kg/ha. of P<sub>205</sub> as Super.

Ref: - Rj. 64(82). Type: - 'M'.

Object: - To study the effect of different levels and sources of N on soil fertility and yield of Wheat.
3. DESIGN:
(i) Fact. in R.B.D.  (ii) (a) 8.  (b) N.A.  (iii) 5.  (iv) (a) 9'2 m. x 5'5 m.  (b) 7'4 m. x 3'7 m.  (v) 91 cm. x 91 cm.  (vi) Yes.

4. GENERAL:
(i) Fair.  (ii) Nil.  (iii) Yield of grain and fodder.  (iv) (a) 1963 only.  (b) No.  (c) Nil.  (v) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1052 Kg/ha.  (ii) 182'2 Kg/ha.  (iii) 'Extra vs. others' alone is highly significant.  (iv) Av. yield of grain in Kg/ha.

\[ C_0 = 702 \text{ and } C_1 = 488 \text{ Kg/ha.} \]

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Mean 1148 1244 1220 1204

C.D. for 'extra vs. others' = 136'2 Kg/ha.

**Crop**: Wheat (Rabi).

**Site**: Govt. S.K.N. Agri. College Farm, Jobner.

Ref. :- Rj. 60(84).

Type. :- 'M'.

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

1. BASAL CONDITIONS:
(i) (a) Guar (G.M.), Wheat.  (b) Guar.  (c) Nil.  (d) Sandy loam.  (ii) 16.10.1960.  (iv) (a) 2 ploughings.  (b) N.A.  (c) 92 Kg/ha.  (d) Rows 23 cm. apart  (e) N.A.  (v) N.A.  (vi) C-591.  (vii) Irrigated.  (viii) 1 weeding.  (ix) Nil.  (x) 3.3.61.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N: N_0 = 0, N_1 = 44'8 and N_2 = 89'7 Kg/ha.
(2) 4 levels of P_2O_5: P_0 = 0, P_1 = 44'8, P_2 = 89'7 and P_3 = 134'5 Kg/ha.

3. DESIGN:
(i) Fact. in R.B.D.  (ii) (a) 12.  (b) N.A.  (iii) 4.  (iv) (a) 11'0 m. x 3'7 m.  (b) 10'4 m. x 3'1 m.  (v) 30 cm. x 30 cm.  (vi) Yes.

4. GENERAL:
(i) and (ii) Nil.  (iii) Yield of grain and straw.  (iv) (a) 1960 only.  (b) and (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
(i) 3126 Kg/ha.  (ii) 376'7 Kg/ha.  (iii) None of the effects is significant.  (iv) Av. yield of grain in Kg/ha.
Crop: Wheat (Rabi).
Site: Govt. S.K.N. Agri. College Farm, Jobner.

Object: To study the effect of spartin-B on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) Nil. (b) Sandy loam. (iii) to (v) N.A. (vi) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

   9 manuriial treatments: \( T_6 = \text{Control}, T_1 = 75, T_2 = 100, T_3 = 125, T_4 = 150, T_5 = 175, T_6 = 200, T_7 = 225 \) and \( T_8 = 250 \) Kg/ha. of spartin-B.

3. DESIGN:

   (i) R.B.D. (ii) Nil. (iii) 4. (iv) (a) N.A. (b) 5'0 m. x 3'0 m. (v) N.A. (vi) Yes.

4. GENERAL:

   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1965 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

   (i) 2651 Kg/ha. (ii) 600'7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

   Treatment: \( T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8 \)

   Av. yield: 2433 2667 2050 2550 2800 3350 2992 2575 2442

---

Crop: Wheat (Rabi).
Site: Govt. S.K.N. Agri. College Farm, Jobner.

Object: To study the effect of pre-sowing seed treatments and split application of N on Wheat.

1. BASAL CONDITIONS:

   (i) Nil. (b) and (c) N.A. (ii) Sandy loam. (iii) 23.10.65. (iv) and (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) Two light hoeings. (ix) and (x) N.A.

2. TREATMENTS:

   All combinations of (1) and (2) with one control
   (1) Two pre sowing seed treatments:
   \( S_1 = \text{Soaking the heads} \) in 5% solution of \( \text{KH}_2\text{PO}_4 \) and \( S_2 = \text{Soaking the heads} \) in 2-5% solution of NaCl.

   (2) 8 levels of N:
   \( N_1 = 40, N_2 = 50, N_3 = 60, N_4 = 70, N_5 = 80, N_6 = 90, N_7 = 100 \) and \( N_8 = 110 \) Kg/ha.
3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 17. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6'0 m. x 5'0 m. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1965 only. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 3377 Kg/ha. (ii) 463.0 Kg/ha. (iii) Effect of "control vs. other treatments" is highly significant. (iv) Av. yield of grain in Kg/ha.

Control=2646 Kg/ha.

<table>
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<tr>
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<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
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C.D. for 'control vs. others'=480.6 Kg/ha.

Crop :- Wheat (Rabi).


Object :- To study the effect of G.M. on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) Clay loam. (iii) 17.10.64. (iv) (a) 2 ploughings and bakhering. (b) Behind the plough. (c) and (d) N.A. (e) —. (v) Nil. (vi) Malvi. (vii) Unirrigated. (viii) 3 weedings. (ix) N.A. (x) 11.2.65.

2. TREATMENTS:
All combinations of (1) and (2) with control
(1) 5 G.M. crops: G1=Sannhemp, G2=Guar, G3=Sannhemp+Guar, G4=Dhaincha and G5=Cowpea.
(2) 2 levels of P025: P0=0 and P1=25 Kg/ha. P025 applied at the time of sowing.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 11. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 20'0 m. x 16'0 m. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1964 and 1965 (modified in 1965). (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 554 Kg/ha. (ii) 183-2 Kg/ha. (iii) Interaction of P X G is significant. (iv) Av. yield of grain in Kg/ha.

Control=358 Kg/ha.

<table>
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<tr>
<th></th>
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<td>515</td>
<td>535</td>
<td>527</td>
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</tbody>
</table>

C.D. for P X G table=220.7 Kg/ha.
Crop: Wheat (Rabi).


Ref: Rj. 65(53).

Type: 'M'.

Object: To study the effect of G.M. and P_{2}O_{5} on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) Clay loam. (iii) 21.10.65. (iv) (a) 2 ploughings and bukhering. (b) Behind the plough. (c) 69.2 Kg/ha. (d) 23 cm. between rows. (e) =. (v) Nil. (vi) Malvi. (vii) Un-irrigated. (viii) 2 weedings. (ix) N.A. (x) 8.3.66.

2. TREATMENTS:

   Main-plot treatments:
   6 G.M. treatments: M_{0} = No G.M., M_{1} = Sannhemp, M_{2} = Gwar, M_{3} = Dhaincha, M_{4} = Sannhemp + gwar and M_{5} = Cowpea.

   Sub-plot treatments:
   2 levels of P_{2}O_{5}: P_{0} = 0 and P_{1} = 25 Kg/ha. of P_{2}O_{5}.

   P_{2}O_{5} applied at the time of sowing of G.M. crop.

3. DESIGN:
   (i) Split-plot. (ii) (a) 6 main-plots/replication; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 10.0 m. x 10.0 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1964 and 65 (modified in 1965). (b) No, (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 301 Kg/ha. (ii) (a) 73.4 Kg/ha. (b) 107.5 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>M_{0}</th>
<th>M_{1}</th>
<th>M_{2}</th>
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C.D. for M marginal means = 78.2 Kg/ha.

---

Crop: Wheat (Rabi).

Site: Govt. Agri. Farm, Mandore.

Ref: Rj. 62(81), 63(62), 64(61).

Type: 'M'.

Object: To study the effect of different levels of N and P in combination on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) Sandy loam. (iii) 3.10.1952; 33.10.1953; 10.11.1954. (iv) (a) N.A. for 62(81); 1 discing, 2 ploughings for 63(62), 3 summer ploughings and 2 ploughings with tractor for 64(61). (b) Sown in lines for 62(81); Behind the plough for others. (c) 85 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) Nil. (vi) RS-31-1. (vii) Irrigated. (viii) 2 weedings for 62(81), 63(62); N.A. for 64(61). (ix) N.A.; 18.3.1964; 29.3.1965.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N as A/S: N_{0} = 0, N_{1} = 33.6, N_{2} = 57.2 and N_{3} = 100.9 Kg/ha.
   (2) 4 levels of P_{2}O_{5} as Super: P_{0} = 0, P_{1} = 33.6, P_{2} = 57.2 and P_{3} = 100.9 Kg/ha.

N broadcast at the time of sowing and \frac{1}{2} N at the time of first irrigation and P_{2}O_{5} drilled.
3. DESIGN:
   (i) 4th confd. (ii) 4 plots/block; 4 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9·1 m. x 3·7 m. (b) 8·5 m. x 3·1 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. for 62(81); Nil for 63(62); Incidence of termites for 64(61). (iii) Yield of grain and fodder. (iv) (a) 1962 to 64. (b) No. (c) Nil. (v) Orasirohi. (vi) Nil. (vii) As the error variances are heterogeneous and Treatments x years interaction is absent therefore, results of individual years are presented under 5.

5. RESULTS:
   62(81)
   (i) 2109 Kg/ha. (ii) 278·8 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>P₀</th>
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<th>P₂</th>
<th>P₃</th>
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   C.D. for N marginal means=296·8 Kg/ha.

63(62)
   (i) 1661 Kg/ha. (ii) 320·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<th>P₀</th>
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<td>1684</td>
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64(61)
   (i) 2218 Kg/ha. (ii) 532·6 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>P₀</th>
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   C.D. for N marginal means=567·5 Kg/ha.
Crop :- Wheat (Rabi).

Site :- Govt. Agri. Farm, Mandore.

Object :- To study the effect of different levels of N, P and different sources of N on the yield and quality of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) N.A. (ii) (a) Sandy. (iii) 30.11.61. (iv) (a) 4 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) Rows 23 cm. apart. (e) N.A. (v) 5604 Kg/ha. of F.Y.M. (vi) C—591. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 10.4.62.

2. TREATMENTS:
   All combinations of (1), (2) and (3) with 3 extra treatments 3 plots in each block.
   (1) 3 sources of N : S_1=A/S, S_2=A/S/N and S_3=Urea.
   (2) 3 levels of N : N_0=0, N_1=22.4 and N_2=44.8 Kg/ha.
   (3) 3 levels of P_2O_5 as Super : P_1=0, P_2=22.4 and P_3=44.8 Kg/ha.

3. DESIGN:
   (i) 3^4 confd. + 3 extra treatments in each block. (ii) (a) 12 plots/block, 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.6 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1961 only. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:
   (i) 2831 Kg/ha. (ii) 339.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

\[
T_1=2844, \quad T_2=2747 \quad \text{and} \quad T_3=2671 \quad \text{Kg/ha.}
\]

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Crop :- Wheat (Rabi).

Site :- Govt. Agri. Farm, Mandore.

Object :- To study the effect of application of N, P and K applied alone and in mixture on soil preparation and quality of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy. (iii) 29.11.61. (iv) (a) 2 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) Rows 23 cm. apart. (e) N.A. (v) N.A. (vi) K.S. 31-1. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 6/7.4.62.
2. TREATMENTS:

Treatments in one direction
A₁ = Separate application of treatments and
A₂ = Mixed application of treatment.

Treatments in orthogonal direction
All combinations of (1), (2) and (3) with one control
(1) 2 levels of N as A/S: \( N₁ = 33.6 \) and \( N₂ = 67.2 \) Kg/ha.
(2) 2 levels of \( P₂O₅ \) as Super: \( P₁ = 33.6 \) and \( P₂ = 67.2 \) Kg/ha.
(3) 2 levels of \( K₂O \) as Muri. Pot.: \( K₁ = 33.6 \) and \( K₂ = 67.2 \) Kg/ha.

3. DESIGN:
(i) Split-plot design. (ii) (a) 2 strips in one direction and 9 strips in perpendicular direction. (b) N.A. (iii) 3. (iv) (a) 9·2 m. x 3·5 m. (b) 7·4 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1961 only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 2491 Kg/ha. (ii) (a) 463·4 Kg/ha. (b) 331·4 Kg/ha. (c) 320·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Crop :- Wheat (Rabz).

Ref :- Rj. 62(51), 63(54), 64(63).

Site :- Govt. Seed Multiplication Farm, Ora,
Sirohi.

Object :- To study the effect of different levels of N and P on the growth and yield of Wheat.

1. BASAL CONDITIONS:
(i) N.A. for 62(51), Nil for 63(54), Fallow: Winter for 64(63). (b) N.A. for 62(51), 63(54); Fallow for 64(63).
(c) N.A. for 62(51), 63(54); Nil for 64(53). (ii) R.S. 31-1. (iii) 3.11.1952; 12.11.1953; 27.11.1954. (iv) (a) 2 discings with tractor disc, 2 cross cultivations with desi plough and pata for levelling. (b) Line sowing. (c) 85 Kg/ha. (d) 23 cm. between rows. (e) N.A. (f) N.A. for 62(51), 63(54); Nil for 64(63). (vi) R.S. 31-I. (vii) Irrigated. (viii) 1 to 2 weedings. (ix) N.A. (x) N.A.; 16.4.1964; 18.4.1965.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 levels of N as A/S: \( N₁ = 3, N₂ = 33.6, N₃ = 57.2 \) and \( N₄ = 100.9 \) Kg/ha.
(2) 4 levels of \( P₂O₅ \) as Super: \( P₁ = 3, P₂ = 33.6, P₃ = 57.2 \) and \( P₄ = 100.9 \) Kg/ha.
\( N \) broadcast at the time of sowing and \( P \) at first irrigation. \( P₂O₅ \) was drilled.
3. DESIGN:
(i) 4^2 conf. (ii) 4 plots/block, 4 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9·1 m. x 3·7 m. (b) 8·5 m. x 3·1 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-64. (b) No. (c) Results of combined analysis given under 5. (v) Mandore. (vi) Nil. (vii) Error variances are homogeneous and Treatments x years interaction is present.

5. RESULTS:
(i) 1820 Kg/ha. (ii) 505'0 Kg/ha. [based on 30 d.f. made up of Treatments x years interaction]. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
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<th>P_1</th>
<th>P_2</th>
<th>Mean</th>
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<td>1892</td>
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</tbody>
</table>

C.D. for N marginal means = 297·7 Kg/ha.

**Crop :- Wheat (Rabi).**
**Ref :- Rj. 62(45), 64(49).**

**Site :- Govt. Agri. Res. Farm, Sriganganagar.**
**Type :- 'M'.**

Object :- To study the effect of different levels of N and P and their methods of application on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil, (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 3.11.1962, 6.11.1964. (iv) (a) 3 to 4 ploughings. (b) N.A. (c) 66 Kg/ha., 74 Kg/ha. (d) 23 cm. between rows. (e) N.A. (f) N.A. (g) C 591. (h) Irrigated. (ix) 2 weedings. (x) N.A. (x) 16.4.1963, 19.4.1965.

2. TREATMENTS:
Main-plot treatments:
For 62(45)
4 methods of application : M_1 = Whole at sowing as broadcasting, M_2 = Whole at sowing drilling, M_3 = N + full P_2O_5 by broadcasting at sowing + N as top dressing and, M_4 = N + full P_2O_5 by drilling at sowing + N as top dressing.

Sub-plot treatments:
For 62(45)
All combinations of (1) and (2)
(1) 3 levels of N : N_0 = 0, N_1 = 33·6 and N_2 = 67·2 Kg/ha.
(2) 3 levels of P_2O_5 : P_0 = 0, P_1 = 33·6 and P_2 = 67·2 Kg/ha.

For 64(49)
All combinations of (1) and (2)
(1) 3 levels of N : N_0 = 0, N_1 = 37·1 and N_2 = 74·1 Kg/ha.
(2) 3 levels of P_2O_5 : P_0 = 0, P_1 = 37·1 and P_2 = 74·1 Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication. 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 5·5 m. x 4·6 m. (b) 5·5 m. x 3·7 m. (c) P_2O_5 3·7 m. for 62(45), 5·0 m. x 3·2 m. for 64(49). (v) 46 cm. x 45 cm. for 62(45), 23 cm. x 23 cm. for 64(49). (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Yield of grain and straw. (iv) (a) 1962 to 1964. (1963 N.A.). (b) No. (c) Nil. (v) and (vi) N.A. (vii) As the doses for N and P_2O_5 are different for two years the results have not been pooled.
5. RESULTS:

### 62(45)

- (i) 3149 Kg/ha.  
- (ii) (a) 837.2 Kg/ha.  
- (b) 562.1 Kg/ha.  
- (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for N marginal means = 265.0 Kg/ha.

### 64(49)

- (i) 2364 Kg/ha.  
- (ii) (a) 479.0 Kg/ha.  
- (b) 291.0 Kg/ha.  
- (iii) Main effects of N, P and interaction N×P are highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for N or P marginal means = 137.2 Kg/ha.

C.D. for means in the body of N×P table = 237.6 Kg/ha.

---

**Crop:** Wheat (Rabi).  
**Site:** Govt. Agri. Res. Farm, Sriganganagar.  
**Type:** ‘M’.  

Ref.: Rj. 60(53), 60(54).  

Object:—To study the effect of different levels of N, P and different sources of N on the yield of Wheat.

1. **BASAL CONDITIONS**:

- (i) (a) N.A.  
- (b) Mustard and Cotton.  
- (c) Nil.  
- (ii) Sandy loam.  
- (iii) 15.11.1960.  
- (iv) (a) 4 ploughings.  
- (b) N.A.  
- (c) 45 Kg/ha.  
- (d) 23 cm. x 8 cm. to 15 cm.  
- (e) N.A.  
- (f) 5604 Kg/ha. F.Y.M.  
- (vi) C 591. (vii) Irrigated.  
- (viii) 1 weeding and hoeing.  
- (ix) N.A.  
- (x) 26, 27.4.61 for 60(53); 25, 26.4.61 for 60(54).
2. **TREATMENTS:**

All combinations of (1), (2) and (3) with 3 extra treatments.

1. 3 sources of N: S₁ = A/S, S₂ = A/S/N and S₃ = Urea.
2. 3 levels of N: N₀ = 0, N₁ = 22.4 and N₂ = 44.8 Kg/ha.
3. 3 levels of P₂O₅ as Super: P₀ = 0, P₁ = 22.4 and P₂ = 44.8 Kg/ha.

3 extra treatments: T₁ = 44.8 Kg/ha. N as A/S+44.8 Kg. P₂O₅ as Super+22.4 Kg. of K₂O as Mur. Pot., T₂ = 44.8 Kg/ha. N as A/S+N+44.8 Kg. P₂O₅ as Super+22.4 Kg/ha. K₂O as Mur. Pot., T₃ = 44.8 Kg/ha. N as urea+44.8 Kg/ha. P₂O₅ as Super+22.4 Kg/ha. K₂O as Mur. Pot.

Under S₃ above A/C has been used instead of A/S/N in expt. no. 60(54).

3. **DESIGN:**

(i) 3³ confd.
(ii) 12 plots/block, 2 blocks/replication.
(iii) 9:2 m. x 5:5 m.
(iv) 60 cm. x 23 cm.
(v) Yes.

4. **GENERAL:**

(i) Normal.
(ii) Nil.
(iii) Yield of grain.
(iv) (a) and (b). Nil.
(v) and (vi). Nil.
(vi) As the sources of N are different for two years, results have not been pooled.

5. **RESULTS:**

60(53)

(i) 2097 Kg/ha.
(ii) 258.2 Kg/ha.
(iii) Main effect of N alone is significant.
(iv) Av. yield of grain in Kg/ha.

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C.D. for N marginal means = 297.9 Kg/ha.

60(54)

(i) 2239 Kg/ha.
(ii) 179.6 Kg/ha.
(iii) Main effects of S, N and interaction S x N are highly significant. Main effect of P and interaction S x P are significant.
(iv) Av. yield of grain in Kg/ha.

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Crop: Wheat (Rabi).

Site: Govt. Agri. Res. Farm, Sriganganagar.

Object: To study the effect of micronutrients alone and in combination on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Guwar (G.M.) (c) Nil. (ii) Sandy loam. (iii) 29.11.64. (iv) (a) 5 ploughings. (b) Line sowing. (c) 90 Kg/ha. (d) Between rows 23 cm. (e) N.A. (v) 44.8 Kg/ha. of N as A/S by broadcasting. (vi) 44.8 Kg/ha. of P105 by drilling. (vii) 22.4 Kg/ha. of K105 by broadcasting at the time of sowing. (viii) C591. (ix) Irrigated. (x) 44.8 Kg/ha. of N as A/S by broadcasting.

2. TREATMENTS:
   All combinations of (1), (2), (3), (4) and (5)
   (1) 3 levels of Fe as Fe. Sul.: F1 = 5.6, F2 = 11.2 and F3 = 16.8 Kg/ha.
   (2) 3 levels of Mn as Mn. Sul.: M1 = 5.6, M2 = 11.2 and M3 = 16.8 Kg/ha.
   (3) 3 levels of Cu as Cu. Sul.: C1 = 5.6, C2 = 11.2 and C3 = 16.8 Kg/ha.
   (4) 3 levels of BS as Borax: B1 = 5.6, B2 = 11.2 and B3 = 16.8 Kg/ha.
   (5) 3 levels of Zn as Zn. Sul.: Z1 = 5.6, Z2 = 11.2 and Z3 = 16.8 Kg/ha.
   Micronutrients were applied at sowing by broadcast.

3. DESIGN:
   (i) 3^2 conf. Fractional replication. (ii) (a) 9 plots/block, 9 blocks/replication. (b) N.A. (iii) 1.3. (iv) (a) 11.1 m x 4.6 m. (b) 7.4 m x 3.7 m. (v) 1.8 m x 0.5 m. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1964 only. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. RESULTS:
   (i) 1710 Kg/ha. (ii) 293.0 Kg/ha. (iii) Interaction B x C is highly significant and interaction B x Z is significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for means in the body of B x C or B x Z table = 284.6 Kg/ha.
Crop : Wheat (Rabi).
Site : Govt. Agri. Res. Farm, Sriganganagar.

Object:—To find out the effect of N and P under water scarcity condition the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 7.11.64. (iv) (a) 3 ploughings. (b) Drilling. (c) 74 Kg/ha. (d) Between rows 23 cm. (e) N.A. (v) Nil. (vi) C 591. (vii) Irrigated. (viii) 2 hand hoeings. (ix) N.A. (x) 3.4.65.

2. TREATMENTS:
Main-plot treatments:
3 methods of application; M₁=Full fertilizer dose as soil application at sowing, M₂=½ as soil application at sowing and M₃=Full as foliar spray.

Sub-plot treatments:
All combinations of (i) and (ii)
(i) 2 levels of N: N₀=0, N₁=24.7 Kg/ha. (ii) 2 levels of Pₒ₂: Pₒ=0, P₁=24.7 Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 5·5 m x 3·7 m. (b) 5·0 m x 3·2 m. (v) 23 cm. x 23 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1964 only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1594 Kg/ha. (ii) (a) 374·0 Kg/ha. (b) 297·0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

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Crop : Wheat (Rabi).
Site : Govt. Agri. Res. Farm, Sriganganagar.

Object:—To study the effect of different sources and levels of N along with different levels of P and K on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 26.10.1961, 1.12.1963. (iv) (a) 4 to 7 ploughings. (b) Drilling for 61(68), behind the plough for 63(18). (c) 90 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) C 591. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 9, 10.4.1962, 30.4.1964.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2) with a control.
(1) 4 sources of N: S₁ = A/S, S₂ = A/S/N, S₃ = Urea and S₄ = C/A/N.
(2) 2 levels of N: N₁ = 33·6 and N₂ = 67·2 Kg/ha.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 levels of P₂O₅ as Super: P₈ = 0 and P₈ = 33·6 Kg/ha.
(2) 2 levels of K₂O as Mur. Pot.: K₈ = 0 and K₈ = 33·6 Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) 9 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) a) 7·4 m. x 5·5 m. (b) 5·6 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) N.A. for 61(68), Normal for others. (ii) Nil. (iii) Yield of grain. (iv) a) 1961-1963 (1962 N.A.). (b) No. (c) Results of combined analysis are given under 5. (v) N.A. (vi) Nil. (vii) Both main and sub-plot error variances are homogeneous and Treatments x years interaction is absent.

5. RESULTS:
(i) 2176 Kg/ha, (ii) (a) 478·1 Kg/ha. [based on 56 d.f. made up of interaction of various components of main-plot Treatments x years and pooled errors]. (b) 317·2 Kg/ha. [based on 175 d.f. made up of interaction of various components of sub-plot Treatments x years and pooled error]. (iii) Main effect of N and interaction P x N are significant while 'control vs. others' is highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for N marginal means = 119·8 Kg/ha.
C.D. for 'control vs. others' = 179·6 Kg/ha.
C.D. for P means at the same level of N=109·9 Kg/ha.
C.D. for N means at the same level of P=143·0 Kg/ha.

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Sumerpur.
Object :- To study the effect of organic and inorganic manures on the yield of wheat and soil fertility.

Ref :- Rj. 64(77), 65(38).
Type :- 'M'.
1. **BASAL CONDITIONS**:
   (i) (a) N.A. for 64(77); Nil for 65(38). (b) N.A. for 64(77); Cowpea for 65(38). (c) N.A. for 64(77); 22.4 Kg/ha. of N for 65(38). (ii) Sandy loam. (iii) 22.11.1964; 15.11.1965. (iv) (a) 6 ploughings followed by 2 plankings. (b) Line swaying for 64(77); Drilling with desi plough for 65(38). (c) 9·2 Kg/ha. (d) 23 em. between rows. (e) N.A. (v) 22·4 Kg/ha of P_2O_5 as Super by drilling on 21.11.64 for 64(77); 44·8 Kg/ha. of P_2O_5 for 65(38). (vi) R.S. 31-1. (vii) Irrigated. (viii) 1 to 2 hand weedings. (ix) 2 em. for 64(77); N.A. for 65(38). (x) 7.4.1965; 24.3.1966.

2. **TREATMENTS**:
   8 manurial treatments: M_0 =Control, M_1 =22·4 Kg/ha. of N as A/S, M_2 =44·8 Kg/ha. of N as A/S, M_3 =448 Kg/ha. of F.Y.M., M_4 =8967 Kg/ha. of F.Y.M., M_5 =M_1 + M_3, M_6 =M_3 + M_3 and M_1 =M_1 + M_3.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 9·2 m. x 5·5 m. (b) 7·4 m. x 3·7 m. (v) 91 em. x 91 em. (vi) Yes.

4. **GENERAL**:
   (i) Normal. (ii) Nil. (iii) Height of plants and yield of grain. (iv) (a) 1964 to 1965. (b) No. (c) Results of combined analysis are given under 5. (v) Nil. (vi) Dry wind and high temperature affected the earheads in the first week of March in 1964. (vii) Error variances are homogeneous and Treatments x years interaction is present.

5. **RESULTS**:
   (i) 1313 Kg/ha. (ii) 425·1 Kg/ha. (based on 7 d.f. made up of Treatments x years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
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<td>Av. yield</td>
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<td>1704</td>
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<td>1824</td>
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<tr>
<td>C.D.</td>
<td>449·6 Kg/ha.</td>
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**Crop :-** Wheat (Rabi).  
**Site :-** Govt. Agri. Res. Farm, Sultanpur.  
**Ref :-** Rj. 62(79).  
**Type :-** ‘M’.

Object :-To study the effect of foliar application of different levels, sources and time of application of N on Wheat.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Black cotton soil. (iii) 21.10.62. (iv) 2 bakherings, 5 ploughings and 5 plankings. (b) Line swaying. (c) 92·2 Kg/ha. (d) Rows 30 cm. apart. (e) N.A. (v) 33·6 Kg/ha. of P_2O_5 as Super 16·8 Kg/ha. of K,O as Pot. Sul. by broadcasting at the time of sowing. (vi) Kathia. (vii) Unirrigated. (viii) 1 hand hoeing. (ix) N.A. (x) Last week of March, 1963.

2. **TREATMENTS**:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N : N_0 =0, N_1 =11·2 and N_2 =16·8 Kg/ha.
   (2) 2 sources of N : S_1 =Urea and S_2 =C/A/N.
   (3) 2 stages of fertilizer application : T_1 =At tillering and T_2 =At flowering.

3. **DESIGN**:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) 29·3 m. x 9·8 m. (iii) 4. (iv) (a) 4·6 m. x 3·1 m. (b) 4·0 m. x 2·4 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. **GENERAL**:
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952-53 ly. (b) and (c) N.A. (v) N.A. (vi) and (vii) Nil.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) As per treatments. (ii) Sandy loam. (iii) 12.11.61. (iv) (a) 2 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) Row to row 23 cm. (e) N.A. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 5.4.62.

2. TREATMENTS:
All combinations of (1) and (2) with a control.
(1) 3 sources of N : S₁ = T.C., S₂ = F.Y.M. and S₃ = A/S.
(2) 2 levels of N : N₁ = 50 kg and N₂ = 100 kg/ha.
Fertilizers were applied to previous Maize crop.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 9.2 m. × 5.5 m. (b) 7.4 m. × 3.7 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1961 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1664 Kg/ha. (ii) 149.3 Kg/ha. (iii) Main effect of S alone is significant. (iv) Av. yield of grain in Kg/ha.

```
Control = 1556 Kg/ha.

<table>
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<th>S₂</th>
<th>S₃</th>
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<td>Mean</td>
<td>1607</td>
<td>1628</td>
<td>1813</td>
<td>1683</td>
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C.D. for S marginal means = 156.8 Kg/ha.
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**Crop :- Wheat (Rabi).**

**Site :- Govt. Agri. Farm, Tabiji.**

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

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) Nil. (ii) Sandy loam. (iii) 15.11.61. (iv) (a) 4 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) Row to row 23 cm. (e) Nil. (v) 5604 Kg/ha. of F.Y.M. (vi) N.P. 718. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 6.4.62.

2. TREATMENTS:
All combinations of (1), (2) and (3) with 3 extra treatments
(1) 3 sources of N : S₁ = A/S, S₂ = C/A/N and S₃ = Urea.
(2) 3 levels of P₂Ο₅ as Super : P₅ₒ = 0, P₁ = 22.4 and P₂ = 44.8 Kg/ha.
(3) 3 levels of N : N₀ = 0, N₁ = 22.4 and N₂ = 44.8 Kg/ha.
Extra treatments : T₁ = 44.8 Kg/ha. of N as A/S + 44.8 Kg/ha. of P₂Ο₅ as Super + 22.4 Kg/ha. of K₂O as Mur. Pot. T₂ = 44.8 Kg/ha. of N as A/S + 44.8 Kg/ha. of P₂Ο₅ as Super + 22.4 Kg/ha. of K₂O as Mur. Pot. T₃ = 44.8 Kg/ha. of N as Urea + 44.8 Kg/ha. of P₂Ο₅ as Super + 22.4 Kg/ha. of K₂O as Mur. Pot.
P₂Ο₅ is applied by drilling and N and K₂O broadcast before sowing.

3. DESIGN:
(i) 3 confd. + 3 extra treatments (per block). (ii) (a) 12 plots/block, 3 blocks/repetition. (b) N.A. (iii) 1. (iv) (a) 9.2 m. × 5.5 m. (b) 7.4 m. × 3.7 m. (v) 91 cm. × 91 cm. (vi) Yes.
1. BASAL CONDITIONS:
(i) (a) N.A. for 64(77); Nil for 65(38). (b) N.A. for 64(77); Cowpea for 65(38). (c) N.A. for 64(77); 22·4 Kg/ha. of N for 65(38). (ii) Sandy loam. (iii) 22-11.1964; 15-11.1965. (iv) (a) 6 ploughings followed by 2 plankings. (b) Line sowing for 64(77); Drilling with desi plough for 65(3&). (c) 92·2 Kg/ha. (d) 23 em. between rows. (e) N.A. (v) 22·4 Kg/ha. of P 2 O 5 as Super by drilling on 21.11.64 for 64(77); 44·8 Kg/ha. of P 2 O 5 for 65(3&). (vi) R.S. 31-1. (vii) Irrigated. (viii) 1 to 2 hand weedings. (ix) 2 em. for 64(77); N.A. for 65(3&). (x) 7.4.1965; 24.3.1966.

2. TREATMENTS:
8 manuriul treatments: M 0 =Control, M 1 =22·4 Kg/ha. of N as A/S, M 2 =44·8 Kg/ha. of N as A/S, M 3 =44·8 Kg/ha. of F.Y.M., M 4 =8967 Kg/ha. of F.Y.M., M 5 =M 1 +M 3 , M 6 =M 2 +M 3 and M 7 =M 1 +M 6 , N applied at the time of sowing as broadcast P 2 O 5 and F.Y.M. applied before sowing by mixing with the soil and broadcast.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 9·2 m.x5·5 m. (b) 7·4 m.x3·7 m. (v) 91 cm.x91 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Height of plants and yield of grain. (iv) (a) 1964 to 1965. (b) No. (c) Results of combined analysis are given under 5. (v) Nil. (vi) Dry wind and high temperature affected the earheads in the first week of March in 1964. (vii) Error variances are homogeneous and Treatments x years interaction is present.

5. RESULTS:
(i) 1313 Kg/ha. (ii) 425·1 Kg/ha. (based on 7 d.f. made up of Treatments x years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

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<th>Treatment</th>
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<th>M 1</th>
<th>M 2</th>
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<td>Av. yield</td>
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<td>894</td>
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<td>1649</td>
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<td>C.D.</td>
<td>449·6 Kg/ha.</td>
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Ref: Rj. 62(79).
Type: 'M'.

Object: —To study the effect of foliar application of different levels, sources and time of application of N on Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Black cotton soil. (iii) 21.10.62. (iv) 2 bakherings, 5 ploughings and 5 plankings. (b) Line sowing. (c) 92·2 Kg/ha. (d) Rows 30 cm. apart. (e) N.A. (v) 33·6 Kg/ha. of P 2 O 5 as Super 16·8 Kg/ha. of K 2 O as Pat. sul. by broadcasting at the time of sowing. (vi) Kathia. (vii) Unirrigated. (viii) 1 hand hoeing. (ix) N.A. (x) Last week of March, 1963.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N: N 0 =0, N 1 =11·2 and N 2 =16·8 Kg/ha.
(2) 2 sources of N: S 1 =Urea and S 2 =C/A/N.
(3) 2 stages of fertilizer application: T 1 =At tillering and T 2 =At flowering.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) 29·3 m.x9·8 m. (iii) 4. (iv) (a) 4·6 m.x3·1 m. (b) 4·0 m.x2·4 m. (v) 30 cm.x30 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1952-53ly. (b) and (c) Nil. (v) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 499 Kg/ha. (ii) 131.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

\[
\text{Control} = 492 \text{ Kg/ha.}
\]

\[
\begin{array}{|c|c|c|c|}
\hline
& N_1 & N_2 & \text{Mean} \\
\hline
S_1 & 518 & 518 & 518 \\
S_2 & 482 & 491 & 486 \\
\hline
\text{Mean} & 500 & 504 & 502 \\
\hline
T_1 & 501 & 537 & \\
T_2 & 499 & 472 & \\
\hline
\end{array}
\]

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Res. Farm, Sultanpur.
Object :- To study the effect of foliar application of different levels, sources and time of application of N on Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Black cotton soil. (iii) 28.10.64. (iv) (a) 2 bakherings. (b) Drilling. (c) 98 Kg/ha. (d) Between lines 30 cm. (e) N.A. (v) 16.8 Kg/ha. of P_2O_5 and 16.8 Kg/ha. of K_2O by drilling on 28.10.64. (vi) N.A. (vii) Unirrigated. (viii) Nil, (ix) N.A. (x) 20.3.65.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 2 sources of N : S_1 = Urea, S_2 = C/A/N.
(2) 3 levels of N : N_0 = 0, N_1 = 11.2, and N_2 = 22.4 Kg/ha.
(3) 2 stages of fertilizer application : T_1 = At tillering, and T_2 = Before flowering.

3. DESIGN:
(i) 3 x 2^2 confd. (ii) 6 plots/block, 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 4.6 m. x 3.1 m. (b) 4.0 m. x 2.4 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(iv) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1962-contd. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. RESULTS:
(i) 663 Kg/ha. (ii) 106.0 Kg/ha. (iii) All the main effects and interaction N x S x T are significant. (iv) Av. yield of grain in Kg/ha.

\[
\begin{array}{|c|c|c|c|}
\hline
& N_0 & N_1 & N_2 & \text{Mean} \\
\hline
S_1 & 718 & 1045 & 881 & 788 & 655 \\
S_2 & 587 & 819 & 703 & 655 & 555 \\
\hline
\text{Mean} & 405 & 652 & 932 & \\
\hline
T_1 & 746 & 1058 & 902 & \\
T_2 & 559 & 806 & 682 & \\
\hline
\end{array}
\]
Object: To study the effect of different G.M. crops at different levels of P with and without molybdeum on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) G.M.—Wheat. (b) G.M. (c) N.A. (ii) Black cotton soil. (iii) 13.7.63. (iv) (a) 1 ploughing and 1 planking. (b) Drilling. (c) 98 Kg/ha. (d) Rows 30 cm. apart. (e) N.A. (v) 22.4 Kg/ha of N by broadcasting. (vi) N.P.-718. (vii) Irrigated. (viii) 1 weeding and hoeing. (ix) N.A. (x) 14.4.64.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of Molybdenum: M₀ =0 and M₁ = 3 gm/ha.
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 4 G.M. treatments: G₀=Control, G₁=Sanai, G₂=Guax and G₄=Cowpea.
   (2) 3 levels of P₂₀: P₀ =0, P₁ = 33.6 and P₂ = 67.2 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 12 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 80 m. x 5.5 m. (b) 7.4 m. x 4.6 m. (v) 30 cm. x 46 cm. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963 only. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1618 Kg/ha. (ii) (a) 89.5 Kg/ha. (b) 123.1 Kg/ha. (iii) Main effects of G and P are highly significant. (iv) Av. yield of grain in Kg/ha.

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<th>G₁</th>
<th>G₂</th>
<th>G₄</th>
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C.D. for G marginal means=133.0 Kg/ha.
C.D. for P marginal means=115.4 Kg/ha.

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Object: To study the residual effect of T.C., F.Y.M. and A/S applied to previous Maize crop on subsequent Wheat crop.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) As per treatments. (ii) Sandy loam. (iii) 12.11.61. (iv) (a) 2 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) Row to row 23 cm. (e) N.A. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 5.4.62.

2. TREATMENTS:
   All combinations of (1) and (2) with a control.
   (1) 3 sources of N: $S_1=T.C., S_2=F.Y.M.$ and $S_3=Urea.$
   (2) 2 levels of N: $N_1=50.4$ and $N_2=100.9$ Kg/ha.
   Fertilizers were applied to previous Maize crop.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1961 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1664 Kg/ha. (ii) 149.3 Kg/ha. (iii) Main effect of S alone is significant. (iv) Av. yield of grain in Kg/ha.

\[
\begin{array}{|c|c|c|c|}
\hline
 & S_1 & S_2 & S_3 \\
\hline
N_1 & 1695 & 1707 & 1745 \\
N_2 & 1519 & 1548 & 1880 \\
Mean & 1607 & 1628 & 1813 \\
\hline
\end{array}
\]

C.D. for S marginal means=156.8 Kg/ha.

---

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Tabiji.

Ref :- Rj. 61(54).
Type :- 'M'.

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (ii) Sandy loam. (iii) 15.11.61. (iv) (a) 4 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) Row to row 23 cm. (e) Nil. (v) 5604 Kg/ha. of F.Y.M. (vi) N.P. 718. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 6.4.62.

2. TREATMENTS:
   All combinations of (1), (2) and (3) with 3 extra treatments
   (1) 3 sources of N : $S_1=A/S, S_2=C/A/N$ and $S_3=Urea.$
   (2) 3 levels of $P_1O_3$ as Super : $P_3=0, P_1=22.4$ and $P_2=44.8$ Kg/ha.
   (3) 3 levels of N : $N_0=0, N_1=22.4$ and $N_2=44.8$ Kg/ha.
   Extra treatments: $T_1=44.8$ Kg/ha. of N as $A+S$ of $P_2O_3$ as Super + $22.4$ Kg/ha. of $K_4O$ as Mur. Pot. + $T_2=44.8$ Kg/ha. of $P_2O_3$ as Super + $22.4$ Kg/ha. of $K_4O$ as Mur. Pot. and $T_3=44.8$ Kg/ha. of N as Urea + $44.8$ Kg/ha. of $P_2O_3$ as Super + $22.4$ Kg/ha. of $K_4O$ as Mur. Pot.
   $P_1O_3$ is applied by drilling and N and $K_4O$ broadcast before sowing.

3. DESIGN:
   (i) 3' confd. + 3 extra treatments (per block). (ii) (a) 12 plots/block, 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1958 to 1961 [Not conducted in 1960]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 3247 Kg/ha. (ii) 291·9 Kg/ha. (iii) Main effect of T alone is significant. (iv) Av. yield of grain in Kg/ha.

\[ T_1 = 3507, T_2 = 3120 \text{ and } T_3 = 3730 \text{ Kg/ha}. \]

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C.D. for T marginal means = 583·1 Kg/ha.

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Tabiji.
Object :- To study the effect of gypsum treated water along with N, P and K on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Guar (G.M). (c) N.A. (ii) Sandy loam. (iii) 9.11.64. (iv) (a) 4 ploughings. (b) Behind the plough. (c) 98 Kg/ha. (d) 23 cm. between rows. (e) Nil. (v) 5604 Kg/ha. of F.Y.M. (vi) R.S. 31-1. (vii) Irrigated. (viii) 1 weeding. (ix) Nil. (x) 1, 2, 4, 65.

2. TREATMENTS:
Main-plot treatments:
2 type of water: \( T_1 = \) Water treated with Gypsum and \( T_2 = \) Untreated with Gypsum.

Sub-plot treatments:
4 manurial treatments: \( N_0 = \) Control, \( N_1 = 22·4 \text{ Kg/ha. of N} + 22·4 \text{ Kg/ha. of } P_2O_5 + 22·4 \text{ Kg/ha. of } K_2O, \)
\( N_2 = 44·8 \text{ Kg/ha. of N} + 44·8 \text{ Kg/ha. of } P_2O_5 + 22·4 \text{ Kg/ha. of } K_2O, \) and \( N_3 = 44·8 \text{ Kg/ha. of N} + 22·4 \text{ Kg/ha. of } P_2O_5 + 22·4 \text{ Kg/ha. of } K_2O. \)

N as A/S by broadcast, \( P_2O_5 \) as Super by drilling and \( K_2O \) as Mur. Pot. by broadcast.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replcation, 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 9·2 m. X 5·5 m. (b) 7·4 m. X 3·7 m. (v) 91 cm. X 91 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—contd. [1965 not conducted]. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2004 Kg/ha. (ii) (a) 424·0 Kg/ha. (b) 309·9 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.
Crop: Wheat (Reh).
Site: Govt. Agri. Farm, Tabiji.
Ref: Rj. 61(67).
Type: ‘M’.

Object: To study the effect of N, P and K fertilizers in two split doses of N on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Maize-Wheat. (b) Maize. (c) Nil. (ii) Sandy loam. (iii) 15.11.61. (iv) (a) 4 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 5.4.62.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of P$_4$O$_4$ as Super: P$_1$=0, P$_2$=22.4 and P$_3$=44.8 Kg/ha.
   (2) 2 levels of K$_2$O as Mur. Pot.: K$_1$=0 and K$_2$=22.4 Kg/ha.

   Sub-plot treatments:
   5 manurial treatments: M$_0$=Control, M$_1$=33.6 Kg/ha. of N as A/S in single dose, M$_2$=33.6 Kg/ha. of N as A/S in split doses, M$_3$=67.2 Kg/ha. of N as A/S in single dose and M$_4$=67.2 Kg/ha. of N as A/S in split doses.

3. DESIGN:
   (i) Split-plot. (ii) 6 main-plots/replication, 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.3 m. x 5.5 m. (b) 6.4 m. x 4.6 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1961 only. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
   (i) 2661 Kg/ha. (ii) (a) 320.4 Kg/ha. (b) 396.9 Kg/ha. (iii) Main effect of M is highly significant. (iv) Av. yield of grain in Kg/ha.

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<th>M$_2$</th>
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C.D. for M marginal means=225.1 Kg/ha.

C.D. for N marginal means=234.7 Kg/ha.
Crop: Wheat (Rabi).

Site: Govt. Agri. Farm, Tabiji.

Type: 'M'.

Object: To study the effect of different levels of N, P, K and different sources of N on Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. for 63(20); Nil for 64(72). (b) N.A. for 63(20); Maize for 64(72). (c) N.A. for 63(20); 44.8 Kg/ha of N + 22.4 Kg/ha of P₂O₅.
   (ii) Sandy loam.
   (iii) 11.11.1963; 23.11.1964.
   (iv) (a) 5 ploughings.
   (v) Behind the plough.
   (vi) 98 Kg/ha.
   (vii) 23 cm. x 15 cm.
   (viii) N.A.
   (ix) Nil.
   (x) R.S. 31-1.
   (xi) Irrigated.
   (xii) 1 weeding.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2) with a control
   (1) 4 sources of N: S₁ = A/S, S₂ = A/S/N, S₃ = Urea and S₄ = C/A/N.
   (2) 2 levels of N: N₁ = 33.6 and N₂ = 67.2 Kg/ha.

   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 33.6 Kg/ha.
   (2) 2 levels of K₂O as Mur. Pot.: K₀ = 0 and K₁ = 33.6 Kg/ha.

N and K₂O broadcast, P₂O₅ drilled before sowing.

3. DESIGN:
   (i) Split-plot.
   (ii) (a) 9 main-plots/replication; 4 sub-plots/main-plot. (b) N.A.
   (iii) 4 for 63(20); 3 for 64(72).
   (iv) (a) 7.4 m. x 5.5 m. for 63(20); 9.2 m. x 5.5 m. for 64(72).
   (v) 6.5 m. x 4.6 m. for 63(20); 7.4 m. x 3.7 m. for 64(72).
   (vi) 46 cm. x 46 cm.; 91 cm. x 91 cm.
   (vii) Yes.

4. GENERAL:
   (i) Normal.
   (ii) Nil.
   (iii) Yield of grain and fodder.
   (iv) (a) 1963 to 1964.
   (v) Nil.
   (vi) Nil.
   (vii) Since the sub-plot error variances are heterogenous, results of individual years are presented under 5.

5. RESULTS:
63(20)
   (i) 1054 Kg/ha.
   (ii) (a) 333.0 Kg/ha.
   (b) 212.0 Kg/ha.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in Kg/ha.

Without nitrogen

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With nitrogen

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64(72)

(i) 2865 Kg/ha. (ii) (a) 823·5 Kg/ha. (b) 462·2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

### Without Nitrogen

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| P<sub>0</sub> | 2796         | 3169         | 2913         | 2780         | 3008         | 2850         | 2919         | 2743 |
| P<sub>1</sub> | 2663         | 3138         | 2830         | 2552         | 2819         | 2744         | 2871         | 2786 |

---

**Crop:** Wheat (*Rabi*).

**Site:** Raj. College Agri. Farm, Udaipur.

**Object:** To study the effect of N, P, and K at various levels on the yield and quality of Maize and its residual effect on Wheat crop.

1. **BASAL CONDITIONS**:

   (i) (a) Nil. (b) Maize. (c) As per treatments. (ii) Clay loam. (iii) 23.11.61. (iv) (a) 4 ploughings. (b) Drilling. (c) 40 Kg/ha. (d) Rows 23 cm. apart. (e) N.A. (v) Nil. (vi) R.S. 81—1. (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. **TREATMENTS**:

   All combinations of (1) and (2) with a control.

   (1) 5 levels of N as A/S: N<sub>0</sub>=0, N<sub>1</sub>=22.4, N<sub>2</sub>=44.8, N<sub>3</sub>=67.2 and N<sub>4</sub>=90 Kg/ha.

   (2) 3 level of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>0</sub>=0, P<sub>1</sub>=26.9 and P<sub>2</sub>=53.8 Kg/ha.

   All plots excepting control plot received 44.8 Kg/ha of K<sub>2</sub>O as Mur. Pot. These treatment were applied to maize crop in Kharif residual effect is studied on wheat crop.

3. **DESIGN**:

   (i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 6. (iv) (a) 9·2 m. x 3·7 m. (b) 7·4 m. x 2·7 m. (v) 91 cm. x 46 cm. (vi) Yes.

4. **GENERAL**:

   Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1961 only. (b) Yes. (c) Nil. (v) to (vii) N.A.

5. **RESULTS**:

   (i) 2710 Kg/ha. (ii) 473·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
Crop: - Wheat (Rabi).

Site: - Raj. College Agri. Farm, Udaipur.

Ref: - Rj. 61(63).

Type: - 'M'.

Object: - To study the effect of N, P and K at various levels on the yield and quality of Maize and its residual effect on Wheat crop.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) As per treatments. (ii) Clay loam. (iii) 23.11.61. (iv) (a) 4 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) R.S. 31—1. (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS:
   8 manurial treatments: \(N_0=\text{Control, } N_1=44.8 \text{ Kg/ha. of } P_2O_5 \text{ as Super } +44.8 \text{ Kg/ha. of } K_2O \text{ as Mur. of Pot., } N_2=22.4 \text{ Kg/ha. of } N \text{ as } A/S+N_1, N_3=44.8 \text{ Kg/ha. of } N \text{ as } A/S+N_2, N_4=67.2 \text{ Kg/ha. of } N \text{ as A/S+N}_1, N_5=89.7 \text{ Kg/ha. of } N \text{ as A/S+N}_1, N_6=112.1 \text{ Kg/ha. of } N \text{ as A/S+N}_1, N_7=184.5 \text{ Kg/ha. of } N \text{ as A/S+N}_1.

These treatments were given to the maize crop in kharif.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1961 only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
   (i) 2231 Kg/ha. (ii) 281.1 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

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Crop: - Wheat (Rabi).

Site: - Rural Institute Farm, Vidhya Bhawan, Udaipur.

Ref: - Rj. 65(50).

Type: - 'M'.

Object: - To work out the suitable fertilizer schedule for irrigated Wheat.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Loam. (iii) 29.10.65. (iv) (a) N.A. (b) Behind the plough. (c) 100 Kg/ha. (d) 30 cm. between the rows. (e) —. (v) As per treatments. (vi) N.P.—718 (medium). (vii) Irrigated. (viii) 1 hoeing and 1 weeding. (ix) N.A. (x) 19, 20.4.66.

2. TREATMENTS:
All combinations of (1), (2) and (3).
(1) 4 levels of N: N₀ = 0, N₁ = 45, N₂ = 90 and N₃ = 135 Kg/ha.
(2) 3 levels of P₀ₘₐₜ: P₀ = 0, P₁ = 45 and P₂ = 90 Kg/ha.
(3) 3 levels of K₀ₘₐₜ: K₀ = 0, K₁ = 22.5 and K₂ = 45 Kg/ha.
P₀ₘₐₜ drilling before sowing. Half N at sowing and half at first irrigation, K₀ₘₐₜ at first irrigation.

3. DESIGN:
(i) 4 x 3 x 3 confd. (ii) (a) 12 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 5'0 m. x 4'0 m. (b) 4'0 m. x 3'0 m. (v) 50 cm. x 50 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1965—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 4587 Kg/ha. (ii) 4576 Kg/ha. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for P marginal means = 270.6 Kg/ha.
C.D. for N marginal means = 312.1 Kg/ha.

Crop :- Wheat (Rabi).
Site :- Rural Institute Farm, Vidhya Bhawan, Udaipur.
Object :- To see the effect of N and method of application of manure on the yield of irrigated Wheat.

Ref :- Rj. 65(26).
Type :- 'M'.

Site :- Rural Institute Farm, Vidhya Bhawan, Udaipur.
Object :- To see the effect of N and method of application of manure on the yield of irrigated Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) N.A. (iii) 30.10.65. (iv) (a) N.A. (b) Behind the plough. (c) 100 Kg/ha. (d) 30 cm. between the rows. (e) Nil. (v) As per treatments. (vi) N.P. 718 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 21 to 23.4.66.
2. TREATMENTS:

Main-plot treatments:

12 methods of application of \( P_2O_5 \) at 40 Kg/ha.
- \( M_1 \) = \( \frac{1}{2} \) as broadcast + \( \frac{1}{2} \) top dressing at 1st irrigation.
- \( M_2 \) = \( \frac{1}{2} \) broadcast before sowing + \( \frac{1}{2} \) drilled at 1st irrigation.
- \( M_3 \) = \( \frac{1}{2} \) drilled with seed + \( \frac{1}{2} \) top dressing at 1st irrigation.
- \( M_4 \) = \( \frac{1}{2} \) drilled before seed + \( \frac{1}{2} \) top dressing at 1st irrigation.
- \( M_5 \) = \( \frac{1}{2} \) drilled before seed + \( \frac{1}{2} \) drilled at 1st irrigation.
- \( M_6 \) = \( \frac{1}{2} \) as broadcast + \( \frac{1}{2} \) as top dressing at 1st irrigation.
- \( M_7 \) = \( \frac{1}{2} \) broadcast before sowing + \( \frac{1}{2} \) drilled at 1st irrigation.
- \( M_8 \) = \( \frac{1}{2} \) drilled with seed + \( \frac{1}{2} \) drilled at 1st irrigation.
- \( M_9 \) = \( \frac{1}{2} \) drilled before seed + \( \frac{1}{2} \) drilled at 1st irrigation.
- \( M_{10} \) = \( \frac{1}{2} \) drilled before seed + \( \frac{1}{2} \) as top dressing at 1st irrigation.
- \( M_{11} \) = \( \frac{1}{2} \) drilled before seed + \( \frac{1}{2} \) drilled at 1st irrigation.
- \( M_{12} \) = \( \frac{1}{2} \) as broadcast before sowing + \( \frac{1}{2} \) drilled at 1st irrigation.

Sub-plot treatments:

3 levels of N: \( N_1 = 45, N_2 = 90 \) and \( N_3 = 135 \) Kg/ha.

3. DESIGN:

(i) Split-plot. (ii) 12 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 5'0 m. x 3'0 m. (b) 4'0 m. x 2'0 m. (v) 50 cm. x 50 cm. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1965—contd. (b) No. (c) Nil. (v) Arjiya. (vi) and (vii) Nil.

5. RESULTS:

(i) 4860 Kg/ha. (ii) (a) 1247'1 Kg/ha. (b) 750'6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

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<th>( M_2 )</th>
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Crop: Wheat (Rabi).  
Ref: Rj. 60, 61, 62, 63, 64(M.A.E).  
Site: M.A.E. Centre, Sriganganagar. Type: 'M'.  
Object: To study the effect of different levels of N, P, K and F.Y.M. on the yield of Wheat.
1. **BASAL CONDITIONS**:

(i) (a) Cotton-Senji-Maize-Wheat. (b) Maize. (c) As per treatments for 63; N.A. for others. (ii) Sandy loam. (iii) 15th November. (iv) (a) 3 ploughings and harrowings. (b) Line sowing. (c) 80·1 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) Nil. (vi) C—591 (late). (vii) Irrigated. (viii) 3 weedings. (ix) 3 cm. for 61, 63; N.A. for others. (x) 3rd week of April.

2. **TREATMENTS**:

All combinations of (1), (2), (3) and (4)

(1) 3 levels of $N$ as A/S: $N_0 =0$, $N_1 =22·4$ and $N_2 =44·8$ Kg/ha.

(2) 3 levels of $P_2O_5$ as Super: $P_0 =0$, $P_1 =22·4$ and $P_2 =44·8$ Kg/ha.

(3) 3 levels of $K_2O$ as Mur. Pot.: $K_0 =0$, $K_1 =22·4$ and $K_2 =44·8$ Kg/ha.

(4) 2 levels of F.Y.M.: $F_0 =0$ and $F_1 =5600$ Kg/ha.


3. **DESIGN**:

(i) $3^2 \times 2$ Factual. confd. (ii) (a) 9 plots/block, 6 blocks/replication (3 blocks receiving $F_1$ and other 3 blocks received $F_2$). (b) N.A. (iii) 1. (iv) (a) 10·1 m. x 5·0 m. (b) 8·8 m. x 4·6 m. (vi) Yes.

4. **GENERAL**:

(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956-1964. (b) No. (c) Results of combined analysis are given under 5. (v) At other M.A.E. Centre. (vi) Nil. (vii) Expt. No. 56, 57, 58 and 59(M.A.E.) have also been taken for pooling. Error variances are homogeneous and Treatments x years interaction is present.

5. **RESULTS**:

(i) 1634 Kgm/ha. (ii) 352·4 Kgm/ha. (b) N.A. (c) Results of combined analysis are given under 5. (v) At other M.A.E. Centre. (vi) Nil. (vii) Expt. No. 56, 57, 58 and 59(M.A.E.) have also been taken for pooling. Error variances are homogeneous and Treatments x years interaction is present.

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<th>$N_2$</th>
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C.D. for $F$ marginal means=84·1 Kg/ha.

C.D. for $N$ or $P$ marginal means=102·9 Kg/ha.

**Crop**: Wheat.  
**Site**: M.A.E. Centre, Sriganganagar.  
**Ref**: Rj. 60 and 61(M.A.E).  
**Type**: 'M'.

Object: —Type IV: —To study the effect of phosphatic manuring of legumes on the succeeding Wheat crop.

1. **BASAL CONDITIONS**:

(i) (a) Legume-Wheat. (b) Legumes. (c) As per treatments. (ii) Desert soil. (iii) N.A.; 12.11.61. (iv) (a) Ploughing and bakhering. (b) Line sowing. (c) 81 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) Nil. (vi) C—591 (late). (vii) Irrigated. (viii) 3 weedings. (ix) N.A., 3 cm. (x) N.A., 29.4.62.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2) with a control.
(1) 2 leguminous crops: L₁ = Moong and L₂ = Urd.
(2) 3 levels of P₂O₅ as Super given to legumes: P₀ = 0, P₁ = 44.8 and P₂ = 89.7 Kg/ha.

Sub-plot treatments:
3 levels of N as A/S given to Wheat crop: N₀ = 0, N₁ = 16.8 and N₂ = 33.6 Kg/ha.

3. DESIGN:
(i) Split-plot.
(ii) (a) 7 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 3.
(iv) (a) 10.1 cm. × 5.0 m. (b) 8.8 m. × 4.6 m. (v) 61 cm. × 25 cm. (vi) Yes.

4. GENERAL:
(i) Growth and stand poor for 61. (ii) Mild attack of white ants. (iii) Yield of grain and straw.
(iv) (a) 1957-1961. (b) No. (c) Results of combined analysis are presented under 5 results. (v) N.A. (vi) Nil.
(vii) Results of 1957, 58 and 59 have also been considered in presenting the pooled results.

5. RESULTS:
(i) 1301 Kg/ha. (ii) (a) 393.8 Kg/ha. [based on 60 d.f. made up of pooled error]. (b) 239.1 Kg/ha. (based on 140 d.f. made up of pooled error). (iii) Main effects of (LP) and N are highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for (LP) marginal means = 164.0 Kg/ha.
C.D. for N marginal means = 65.0 Kg/ha.

---

Crop :- Wheat.
Site :- M.A.E. Centre, Sriganganagar.
Ref :- Rj. 60(M.A.E).
Type :- 'M'.

Object :- Type VI :- To study the effect of different sources and levels of P along with their methods of application.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Desert soil. (iii) N.A. (iv) (a) 2 disc harrowings and 1-2 beamings. (b) N.A. (c) 78 Kg/ha. (d) 23 cm. (e) —. (v) N.A. (vi) C 591. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3) with a control
(1) 2 sources of P₂O₅ : S₁ = Triple Super and S₂= Ammo. Phos.
(2) 2 levels of P₂O₅ : P₁ = 22.4 and P₂ = 44.8 Kg/ha.
(3) 3 methods of application : M₁ = Broadcasting, M₂ = 6 cm. below seed and M₃ = Basal placement.

3. DESIGN:
(i) R.B.D. (ii) (a) 13. (b) N.A. (iii) 3. (iv) (a) and (b) N.A. (v) N.A.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Yield of grain. (iv) (a) 1956-60. (b) No. (c) Results of combined analysis are presented under 5 Results. (v) N.A. (vi) Nil. (vii) Results 1956 to 1959 have been considered while presenting the pooled results.
5. RESULTS:

Response of Wheat (Kgf/ha.) to different methods of application of P_2O_5

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Response of Wheat (Kgf/ha.) to different sources of P_2O_5

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Crop :- Wheat.

Site :- M.A.E. Cetre, Sriganganagar.

Type :- 'M'.

Object :- Type X : To study the effect of green manure on the yield of Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Sandy loam. (iii) N.A. : 13.11.63 ; 13.11.1954. (iv) and (v) N.A. (vi) C-591. (vii) Irrigated. (viii) to (c) N.A. (x) N.A. : 28.4.64, 30.4.65 ; N.A.

2. TREATMENTS:

All combinations of (1), (2) and (3) with an extra treatment (in each block),

(1) 3 G.M. treatments : G_5 = No G.M., G_4 = G.M. raised in situ with 33.6 Kgf/ha. of P_2O_5 and G_3 = G.M. raised in situ without P_2O_5.

(2) 3 levels of N : N_3 = 5, N_2 = 16.8 and N_1 = 33.6 Kg/ha.

(3) 3 levels of P_2O_5 : P_3 = 0, P_2 = 33.6 Kg/ha. and P_1 = 67.2 Kg/ha.

Extra treatment : T = N, P and K fertilizers equivalent to those present in G.M.

3. DESIGN:

(i) 3^rd confd. (ii) (a) 10 plots/block, 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 14.5 m. x 5.9 m. (v) N.A. (vi) Yes.

4. GENERAL:

(i) to (ii) N.A. (iii) Yield of grain. (iv) (a) 1962 - 1965. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS:

1962

(i) 2130 Kgf/ha. (ii) 85.6 Kgf/ha. (iii) Main effects of G, N and P and interactions G X N and G X N X P and T vs. others are highly significant. (iv) Av. yield of grain in Kg/ha.

\[ T=2279 \text{ Kgf/ha.} \]

<table>
<thead>
<tr>
<th></th>
<th>G_5</th>
<th>G_4</th>
<th>G_3</th>
<th>N_3</th>
<th>N_1</th>
<th>N_0</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_3</td>
<td>1907</td>
<td>2289</td>
<td>2366</td>
<td>2069</td>
<td>2278</td>
<td>2215</td>
<td>2187</td>
</tr>
<tr>
<td>P_1</td>
<td>1655</td>
<td>2086</td>
<td>2134</td>
<td>1959</td>
<td>1942</td>
<td>1973</td>
<td>1958</td>
</tr>
<tr>
<td>P_0</td>
<td>1888</td>
<td>2330</td>
<td>2373</td>
<td>2127</td>
<td>2137</td>
<td>2328</td>
<td>2197</td>
</tr>
<tr>
<td>Mean</td>
<td>1817</td>
<td>2235</td>
<td>2291</td>
<td>2052</td>
<td>2119</td>
<td>2172</td>
<td>2114</td>
</tr>
</tbody>
</table>

| N_3    | 2097| 2177| 2242| 2052| 2119| 2172| 2114 |
C.D. for G, N or P marginal means = 40.2 Kg/ha.
C.D. for body of G x N table = 69.6 Kg/ha.
C.D. for 'T vs. others' = 56.2 Kg/ha.

1963

(i) 1792 Kg/ha. (ii) 71.6 Kg/ha. (iii) Main effects of G, N and P, interactions G x N and G x P and T vs. others are highly significant. (iv) Av. yield of grain in Kg/ha.

\[
T = 2078 \text{ Kg/ha.}
\]

\[
\begin{array}{|c|c|c|c|c|c|c|}
\hline
 & G_0 & G_1 & G_2 & N_0 & N_1 & N_2 & \text{Mean} \\
\hline
P_0 & 1171 & 1736 & 1944 & 1410 & 1661 & 1781 & 1617 \\
P_1 & 1249 & 1984 & 2043 & 1518 & 1793 & 1964 & 1758 \\
P_2 & 1412 & 2148 & 2156 & 1663 & 1938 & 2115 & 1905 \\
\hline
\text{Mean} & 1277 & 1956 & 2048 & 1530 & 1797 & 1953 & 1760 \\
\hline
\end{array}
\]

C.D. for G, N or P marginal means = 33.6 Kg/ha.
C.D. for body of G x N or G x P table = 58.3 Kg/ha.
C.D. for 'T vs. others' = 47.0 Kg/ha.

1964

(i) 2658 Kg/ha. (ii) 139.7 Kg/ha. (iii) Main effects of G and N, interactions G x N, G x P and G x N x P and 'T vs. others' highly significant. Main effect of P and interaction N x P are significant. (iv) Av. yield of grain in Kg/ha.

\[
T = 3398 \text{ Kg/ha.}
\]

\[
\begin{array}{|c|c|c|c|c|c|c|}
\hline
 & G_0 & G_1 & G_2 & N_0 & N_1 & N_2 & \text{Mean} \\
\hline
P_0 & 1629 & 2979 & 3375 & 2451 & 2568 & 2964 & 2661 \\
P_1 & 1894 & 2667 & 2974 & 2462 & 2551 & 2522 & 2512 \\
P_2 & 1898 & 2802 & 2966 & 2484 & 2555 & 2626 & 2535 \\
\hline
\text{Mean} & 1807 & 2816 & 3103 & 2466 & 2558 & 2704 & 2576 \\
\hline
\end{array}
\]

C.D. for G, or N or P marginal means = 65.6 Kg/ha.
C.D. for body of G x N or G x P table = 113.6 Kg/ha.
C.D. for 'T vs. others' = 91.9 Kg/ha.

1965

(i) 2898 Kg/ha. (ii) 927.0 Kg/ha. (iii) Main effects of N and P are highly significant. (iv) Av. yield of grain in Kg/ha.

\[
T = 3628 \text{ Kg/ha.}
\]

\[
\begin{array}{|c|c|c|c|c|c|}
\hline
\text{Treatment} & N_0 & N_1 & N_2 & \text{Av. yield} \\
\hline
\text{Natives} & 2393 & 2814 & 3243 & \\
\text{Av. yield} & 2451 & 2756 & 3243 & \\
\text{C.D. for N or P means} = 437.0 \text{ Kg/ha.} & & & & \\
\text{Treatment} & G_0 & G_1 & G_2 & \text{Av. yield} \\
\hline
\text{Av. yield} & 2519 & 2863 & 3069 & \\
\end{array}
\]
Crop :- Wheat. 
Ref :- Rj. 65(MAE).

Site :- M.A.E. Centre Sriganganagar.
Type :- 'M'.

Object :- Type XI :- To determine the effect of micronutrients on Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Desert soil. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
15 micronutrient treatments:

$T_0$=Control (No fertiliser) applied to soil only, $T_1=35$ Kg/ha. of N+35 Kg/ha. of P₂O₅+35 Kg/ha. of K₂O, $T_2=T_1$+manganese as manganese sulphate at 60 Kg/ha., $T_3=T_1+Zn$ as Zinc sulphate at 30 Kg/ha., $T_4=T_1+Cu$ as copper sulphate at 30 Kg/ha., $T_5=T_1+Boron$ as Borax at 17.5 Kg/ha., $T_6=T_1+Molybdenum$ as Sodium Molybdate at 1.25 Kg/ha., $T_7=T_1+Mn+Zn+Cu+Bo+Mo$, $T_8=T_1+Manganese$ as Manganese Sulphate at 17.5 Kg/ha., $T_9=T_1+Zn$ as Zinc Sulphate at 12.5 Kg/ha., $T_{10}=T_1+Cu$ as Copper Sulphate at 12.5 Kg/ha., $T_{11}=T_1+Boron$ as Borax at 6.2 Kg/ha., $T_{12}=T_1+Molybdenum$ as Sodium Molybdate at 0.62 Kg/ha., $T_{13}=T_1+Mn+Zn+Cu+Bo+Mo$ and $T_{14}=T_1+Spartan$ at 395 Kg/ha.

Treatments $T_5$ to $T_7$ by soil application and $T_8$ to $T_{14}$ by foliar spray.

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

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1965-1966. (b) No. (c) Nil. (v) Sriganganagar. (vi) and (vi) Nil.

5. RESULTS:
(i) 1983 Kg/ha. (ii) 158.4 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1763</td>
<td>1968</td>
<td>1942</td>
<td>1762</td>
<td>2095</td>
<td>1576</td>
<td>1951</td>
<td>2331</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_8$</th>
<th>$T_9$</th>
<th>$T_{10}$</th>
<th>$T_{11}$</th>
<th>$T_{12}$</th>
<th>$T_{13}$</th>
<th>$T_{14}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1918</td>
<td>1917</td>
<td>2199</td>
<td>1703</td>
<td>2030</td>
<td>2358</td>
<td>2231</td>
</tr>
</tbody>
</table>

C.D.=224 Kg/ha.
5. RESULTS:
(i) 1008 Kg/ha. (ii) 271.9 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>855</td>
<td>1340</td>
<td>765</td>
<td>1230</td>
<td>965</td>
<td>881</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
<th>T₁₀</th>
<th>T₁₁</th>
<th>T₁₂</th>
<th>T₁₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1044</td>
<td>1092</td>
<td>985</td>
<td>1158</td>
<td>794</td>
<td>840</td>
<td>760</td>
</tr>
</tbody>
</table>

C.D. = 386 Kg/ha.

Crop : - Wheat.  
Site : - M.A.E. Centre, Sriganganagar.  
Ref : - Rj. 63, 64(MAE).  
Type :- 'M'.

Object : - Type XII—To study the efficiency of foliar spray of fertilizers compared to soil application on Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Sandy loam. (iii) 18.11.1963. (iv) (a) to (e) N.A. (v) Nil. (vi) C-591(164 days).  
(vii) Irrigated. (viii) and (ix) N.A. (x) 30.4.1964; N.A.

2. TREATMENTS:
Main-plot treatments:
4 fertilizer treatments: F₁ = 44.8 Kg/ha. of N as A/S, F₂ = 22.4 Kg/ha. of P₂O₅ as Super, F₃ = 44.8 Kg/ha. of N + 22.4 Kg/ha. of P₂O₅ and F₄ = 44.8 Kg/ha. of N + 22.4 Kg/ha. of P₂O₅ + 22.4 Kg/ha. of K₂O.

Sub-plot treatments:
All combinations of (1) and (2) + 2 extra treatments
(1) 3 methods of application : M₁= Soil application, M₂= Foliar application and M₃= Soil application and foliar application.
(2) 2 levels of application : L₁=½ dose and L₂= Full dose.
2 extra treatments C₁= Water spray and C₂= Absolute control.

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

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-1966 (1965 N.A.). (b) No. (c) Nil. (v) (a) Swarnipur. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
1963
(i) 1231 Kg/ha. (ii) (a) 139.9 Kg/ha. (b) 91.7 Kg/ha. (iii) Main effects of F, (LM) and (F×LM) interaction are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>L₁M₁</th>
<th>L₂M₁</th>
<th>L₁M₂</th>
<th>L₂M₂</th>
<th>L₁M₃</th>
<th>L₂M₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F₁</td>
<td>1258</td>
<td>1628</td>
<td>1077</td>
<td>1393</td>
<td>1129</td>
<td>1792</td>
</tr>
<tr>
<td>F₂</td>
<td>1211</td>
<td>1199</td>
<td>957</td>
<td>1106</td>
<td>982</td>
<td>1208</td>
</tr>
<tr>
<td>F₃</td>
<td>1187</td>
<td>1756</td>
<td>1077</td>
<td>1360</td>
<td>1334</td>
<td>1899</td>
</tr>
<tr>
<td>F₄</td>
<td>1208</td>
<td>1831</td>
<td>1028</td>
<td>1283</td>
<td>1325</td>
<td>1931</td>
</tr>
</tbody>
</table>

Mean 1216 1604 1034 1286 1122 1708 1340
C.D. for F marginal means = 79.0 Kg/ha.
C.D. for (LM) marginal means = 63.0 Kg/ha.
C.D. for (LM) means at the same level of F = 129.0 Kg/ha.
C.D. for F means at the same level of (LM) = 141.0 Kg/ha.

1964

(i) 972 Kg/ha. (ii) (a) 194.0 Kg/ha. (b) 164.0 Kg/ha. (iii) Main effects of F and (LM) are highly significant. (iv) Av. yield of grain in Kg/ha.

\[ C_1 = 552 \text{ Kg/ha. and } C_2 = 474 \text{ Kg/ha.} \]

<table>
<thead>
<tr>
<th></th>
<th>( L_1M_1 )</th>
<th>( L_2M_1 )</th>
<th>( L_3M_1 )</th>
<th>( L_1M_2 )</th>
<th>( L_2M_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F_1 )</td>
<td>1028</td>
<td>1356</td>
<td>1090</td>
<td>1158</td>
<td>1383</td>
<td>1145</td>
</tr>
<tr>
<td>( F_2 )</td>
<td>716</td>
<td>945</td>
<td>722</td>
<td>682</td>
<td>1047</td>
<td>772</td>
</tr>
<tr>
<td>( F_3 )</td>
<td>1013</td>
<td>1482</td>
<td>1044</td>
<td>1087</td>
<td>1661</td>
<td>1167</td>
</tr>
<tr>
<td>( F_4 )</td>
<td>1266</td>
<td>1871</td>
<td>1247</td>
<td>1204</td>
<td>2035</td>
<td>1417</td>
</tr>
<tr>
<td>Mean</td>
<td>1006</td>
<td>1413</td>
<td>742</td>
<td>1026</td>
<td>1033</td>
<td>1522</td>
</tr>
</tbody>
</table>

C.D. for F marginal means = 110.0 Kg/ha.
C.D. for (LM) marginal means = 114.0 Kg/ha.

Crop :- Wheat.

Site :- M.A.E Centre, Sumerpur.

Ref :- 64 and 65(MAE).

Type :- ‘M’.

Object :- Type XII - To study the efficiency of foliar spray of fertilizers compared to soil application on Wheat.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) Grey brown. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS and DESIGN:
   Same as in Type XII expt. conducted at Sriganganagar on page 65.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—1965. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) Sriganganagar. (vi) Nil. (vii) Both error variances are homogeneous and main-plot and sub-plot Treatments x years interaction are absent.

5. RESULTS:
   (i) 649 Kg/ha. (ii) (a) 142.1 Kg/ha. (based on 21 d.f. made up of Treatments x years interaction and pooled error) (b) 104.0 Kg/ha. (based on 168 d.f. made of pooled error). (iii) Main effects of F and (LM) are significant. (iv) Av. yield of grain in Kg/ha.

\[ C_1 = 508 \text{ and } C_2 = 441 \text{ Kg/ha.} \]

<table>
<thead>
<tr>
<th></th>
<th>( L_1M_1 )</th>
<th>( L_2M_1 )</th>
<th>( L_3M_1 )</th>
<th>( L_1M_2 )</th>
<th>( L_2M_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F_1 )</td>
<td>730</td>
<td>821</td>
<td>546</td>
<td>660</td>
<td>692</td>
<td>759</td>
</tr>
<tr>
<td>( F_2 )</td>
<td>471</td>
<td>527</td>
<td>452</td>
<td>494</td>
<td>536</td>
<td>520</td>
</tr>
<tr>
<td>( F_3 )</td>
<td>733</td>
<td>963</td>
<td>672</td>
<td>654</td>
<td>623</td>
<td>728</td>
</tr>
<tr>
<td>( F_4 )</td>
<td>759</td>
<td>939</td>
<td>520</td>
<td>654</td>
<td>739</td>
<td>733</td>
</tr>
<tr>
<td>Mean</td>
<td>673</td>
<td>813</td>
<td>548</td>
<td>615</td>
<td>648</td>
<td>684</td>
</tr>
</tbody>
</table>

C.D. for F marginal means = 57.0 Kg/ha.
C.D. for (LM) marginal means = 51.0 Kg/ha.
Crop: Wheat.
Site: (District): Banswara, Sriganganagar, Pali and Kota.

Object: To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients (Type: A1).

1. BASAL CONDITIONS:
(i) to (c) N.A. (ii) Red and yellow; Desert soil; Grey brown; Red and black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
8 manural treatments
O=Control (no manure).
N1=33.6 Kg/ha. of N.
N2=67.2 Kg/ha. of N.
P1=33.6 Kg/ha. of P2O5.
N1P1=33.6 Kg/ha. of N+33.6 Kg/ha. of P2O5.
N2P1=67.2 Kg/ha. of N+33.6 Kg/ha. of P2O5.
P2=57.2 Kg/ha. of K2O.
N1P2=57.2 Kg/ha. of N+67.2 Kg/ha. of K2O.
N2P2=57.2 Kg/ha. of N+67.2 Kg/ha. of K2O.
N applied as A/S; P2O5 as Super and K2O as Muri. Pot.

3. DESIGN:
A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. Each zone is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A1, 11 of type A2, 11 of type A3 and 3 are of type C. The eleven experiments under type A1, A2, and A3 are distributed as 3 on a kharif cereal, 3 on a rabi cereal, 3 on a cash crop and 2 on oilseed. All the three type-C experiments are conducted on a legume crop.

4. GENERAL:
(i) to (iii) N.A. (iv) (a) 1962-1966. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control yield</td>
<td>512 Kg/ha.; No. of trials=6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1P1</td>
<td>312</td>
<td>770</td>
<td>225</td>
<td>604</td>
<td>848</td>
<td>1075</td>
<td>1223</td>
<td>122.4</td>
</tr>
<tr>
<td>N2P1</td>
<td>770</td>
<td>225</td>
<td>604</td>
<td>848</td>
<td>1075</td>
<td>1223</td>
<td>1223</td>
<td>122.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control yield</td>
<td>741 Kg/ha.; No. of trials=3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1P1</td>
<td>304</td>
<td>485</td>
<td>-8</td>
<td>532</td>
<td>636</td>
<td>787</td>
<td>745</td>
<td>83.7</td>
</tr>
<tr>
<td>N2P1</td>
<td>485</td>
<td>-8</td>
<td>532</td>
<td>636</td>
<td>787</td>
<td>745</td>
<td>745</td>
<td>83.7</td>
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<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control yield</td>
<td>1133 Kg/ha.; No. of trials=3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1P1</td>
<td>593</td>
<td>487</td>
<td>52</td>
<td>698</td>
<td>597</td>
<td>619</td>
<td>830</td>
<td>193.8</td>
</tr>
<tr>
<td>N2P1</td>
<td>487</td>
<td>52</td>
<td>698</td>
<td>597</td>
<td>619</td>
<td>830</td>
<td>830</td>
<td>193.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control yield</td>
<td>705 Kg/ha.; No. of trials=10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1P1</td>
<td>375</td>
<td>537</td>
<td>115</td>
<td>590</td>
<td>722</td>
<td>917</td>
<td>943</td>
<td>49.1</td>
</tr>
<tr>
<td>N2P1</td>
<td>537</td>
<td>115</td>
<td>590</td>
<td>722</td>
<td>917</td>
<td>943</td>
<td>943</td>
<td>49.1</td>
</tr>
<tr>
<td>Sriganganagar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>62 (S.F.T.)</strong></td>
<td>Treatment</td>
<td>N&lt;sub&gt;1&lt;/sub&gt;</td>
<td>N&lt;sub&gt;1&lt;/sub&gt;</td>
<td>P&lt;sub&gt;1&lt;/sub&gt;</td>
<td>N&lt;sub&gt;2&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;</td>
<td>N&lt;sub&gt;2&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;</td>
<td>N&lt;sub&gt;2&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;</td>
<td>N&lt;sub&gt;2&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</td>
</tr>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>275</td>
<td>339</td>
<td>118</td>
<td>212</td>
<td>508</td>
<td>593</td>
<td>684</td>
<td>67.7</td>
</tr>
<tr>
<td>Control yield=983 Kg/ha.; No. of trials=9.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **63 (S.F.T.)** | Treatment | N<sub>1</sub> | N<sub>2</sub> | P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub>K<sub>1</sub> | S.E. |
| Av. response of grain in Kg/ha. | 171 | 289 | -5 | 177 | 353 | 465 | 523 | 48.7 |
| Control yield=1333 Kg/ha.; No. of trials=5. |   |   |   |   |   |   |   |   |

| **64 (S.F.T.)** | Treatment | N<sub>1</sub> | N<sub>2</sub> | P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub>K<sub>1</sub> | S.E. |
| Av. response of grain in Kg/ha. | 244 | 416 | 61 | 337 | 542 | 579 | 725 | 67.5 |
| Control yield=1214 Kg/ha.; No. of trials=10. |   |   |   |   |   |   |   |   |

| **65 (S.F.T.)** | Treatment | N<sub>1</sub> | N<sub>2</sub> | P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub> | N<sub>2</sub>P<sub>1</sub>K<sub>1</sub> | S.E. |
| Av. response of grain in Kg/ha. | 243 | 317 | 53 | 324 | 638 | 798 | 826 | 71.3 |
| Control yield=991 Kg/ha.; No. of trials=12. |   |   |   |   |   |   |   |   |

| Pali |   |   |   |   |   |   |   |   |
| **62 (S.F.T.)** | Treatment | N<sub>1</sub> | N<sub>1</sub> | P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub>K<sub>1</sub> | S.E. |
| Av. response of grain in Kg/ha. | 226 | 365 | 111 | 397 | 484 | 593 | 809 | 62.1 |
| Control yield=889 Kg/ha.; No. of trials=10. |   |   |   |   |   |   |   |   |

| **63 (S.F.T.)** | Treatment | N<sub>1</sub> | N<sub>1</sub> | P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub>K<sub>1</sub> | S.E. |
| Av. response of grain in Kg/ha. | 134 | 210 | 123 | 199 | 275 | 383 | 434 | 33.3 |
| Control yield= 1114 Kg/ha ; No. of trials=21. |   |   |   |   |   |   |   |   |

| **64 (S.F.T.)** | Treatment | N<sub>1</sub> | N<sub>1</sub> | P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub> | N<sub>1</sub>P<sub>1</sub>K<sub>1</sub> | S.E. |
| Av. response of grain in Kg/ha. | 186 | 269 | 97 | 245 | 369 | 399 | 462 | 47.6 |
| Control yield=800 Kg/ha.; No. of trials=17. |   |   |   |   |   |   |   |   |

<p>| <strong>65 (S.F.T.)</strong> | Treatment | N&lt;sub&gt;1&lt;/sub&gt; | N&lt;sub&gt;1&lt;/sub&gt; | P&lt;sub&gt;1&lt;/sub&gt; | N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt; | N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt; | N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt; | N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt; | S.E. |
| Av. response of grain in Kg/ha. | 212 | 301 | 73 | 247 | 323 | 457 | 395 | 54.1 |
| Control yield=1106 Kg/ha.; No. of trials=14. |   |   |   |   |   |   |   |   |</p>
<table>
<thead>
<tr>
<th>Crop:</th>
<th>Wheat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ref:</td>
<td>Rj. 62(SFT).</td>
</tr>
<tr>
<td>Site:</td>
<td>(District): Banswara.</td>
</tr>
<tr>
<td>Type:</td>
<td>'M'.</td>
</tr>
</tbody>
</table>

Object:—To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with others nutrients (Type : A1). |

1. BASAL CONDITIONS :

(i) (a) to (c) N.A. (ii) Red and yellow. (iii) to (vi) N.A. (vii) U.irrigated. (viii) to (x) N.A.

2. TREATMENTS :

8 manrial treatments

<table>
<thead>
<tr>
<th>O=Control (no manure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁₅₃·6 Kg/ha. of N</td>
</tr>
<tr>
<td>N₂=67·2 Kg/ha. of N</td>
</tr>
<tr>
<td>P₁=33·6 Kg/ha. of P₂O₅</td>
</tr>
<tr>
<td>N₁P₁=33·6 Kg/ha. of N+33·6 Kg/ha. of P₂O₅</td>
</tr>
<tr>
<td>N₂P₁=67·2 Kg/ha. of N+33·6 Kg/ha. of P₂O₅</td>
</tr>
<tr>
<td>N₁P₂=67·2 Kg/ha. of N+67·2 Kg/ha. of P₂O₅</td>
</tr>
<tr>
<td>N₂P₂=67·2 Kg/ha. of N+67·2 Kg/ha. of P₂O₅</td>
</tr>
<tr>
<td>N₁P₃=33·6 Kg/ha. of N+33·6 Kg/ha. of K₂O</td>
</tr>
<tr>
<td>N₂P₃=67·2 Kg/ha. of N+67·2 Kg/ha. of P₂O₅+33·6 Kg/ha. of K₂O</td>
</tr>
</tbody>
</table>

N applied as A/S, P₂O₅ as Super and K₂O as Mur. of Pot.

3. DESIGN:

Same as in type A₁ (Irrigated) on page 67.

4. GENERAL:

(i) to (iii) N.A. (iv) (a) 1962—only (b) and (c) N.A. (v) to (vii) N.A.
5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$P_1$</th>
<th>$N_1P_1$</th>
<th>$N_2P_1$</th>
<th>$N_1P_2$</th>
<th>$N_2P_2$</th>
<th>$N_1P_2K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>88</td>
<td>332</td>
<td>9</td>
<td>425</td>
<td>464</td>
<td>563</td>
<td>569</td>
<td>56.5</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 589 Kg/ha.; No. of trials = 3.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) Red and yellow; Grey brown; Desert soil; Red and black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:

8 manurial treatments:

- $O$ = Control (no manure).
- $N_1 = 33.6$ Kg/ha. of $N$
- $P_1 = 33.6$ Kg/ha. of $P_2O_5$
- $P_2 = 67.2$ Kg/ha. of $P_2O_5$
- $N_1P_1 = 33.6$ Kg/ha. of $N$ + $33.6$ Kg/ha. of $P_2O_5$
- $N_1P_2 = 33.6$ Kg/ha. of $N$ + $67.2$ Kg/ha. of $P_2O_5$
- $N_2P_2 = 67.2$ Kg/ha. of $N$ + $67.2$ Kg/ha. of $P_2O_5$
- $N_2P_2K_2 = 67.2$ Kg/ha. of $N$ + $67.2$ Kg/ha. of $P_2O_5 + 67.2$ Kg/ha. of $K_2O$.

N applied as A/S, $P_2O_5$ as Super and $K_2O$ as Mur. of Pot.

3. DESIGN:

Same as in type A (Irrigated) on page 67.

4. GENERAL:

(i) to (iii) N.A. (iv) (a) 1962 to 1966. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$N_1P_1$</th>
<th>$N_2P_1$</th>
<th>$N_1P_2$</th>
<th>$N_2P_2$</th>
<th>$N_1P_2K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>270</td>
<td>271</td>
<td>434</td>
<td>815</td>
<td>902</td>
<td>1219</td>
<td>1230</td>
<td>167.4</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 696 Kg/ha.; No. of trials = 6.

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$N_1P_1$</th>
<th>$N_2P_1$</th>
<th>$N_1P_2$</th>
<th>$N_2P_2$</th>
<th>$N_1P_2K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>247</td>
<td>220</td>
<td>197</td>
<td>516</td>
<td>452</td>
<td>678</td>
<td>760</td>
<td>173.5</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 655 Kg/ha.; No. of trials = 6.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$N_1P_1$</th>
<th>$N_2P_1$</th>
<th>$N_1P_2$</th>
<th>$N_2P_2$</th>
<th>$N_1P_2K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>566</td>
<td>355</td>
<td>316</td>
<td>408</td>
<td>349</td>
<td>705</td>
<td>1027</td>
<td>190.2</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 1107 Kg/ha.; No. of trials = 3.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. response of grain in Kg/ha.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 (S.F.T.)</td>
<td>$N_1$ $P_1 \quad P_2 \quad N_1P_1 \quad N_2P_1 \quad N_2P_2 \quad N_1P_2$</td>
<td>$N_1P_2K_1$</td>
</tr>
<tr>
<td>Control yield = 670 Kg/ha.</td>
<td>52.1</td>
<td></td>
</tr>
<tr>
<td>No. of trials = 9.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62 (S.F.T.)</td>
<td>$N_1$ $P_1 \quad P_2 \quad N_1P_1 \quad N_2P_1 \quad N_2P_2 \quad N_1P_2K_2$</td>
<td>S.E.</td>
</tr>
<tr>
<td>Control yield = 748 Kg/ha.</td>
<td>69.1</td>
<td></td>
</tr>
<tr>
<td>No. of trials = 9.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>63 (S.F.T.)</td>
<td>$N_1$ $P_1 \quad P_2 \quad N_1P_1 \quad N_2P_1 \quad N_2P_2 \quad N_1P_2K_2$</td>
<td>S.E.</td>
</tr>
<tr>
<td>Control yield = 878 Kg/ha.</td>
<td>28.7</td>
<td></td>
</tr>
<tr>
<td>No. of trials = 22.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64 (S.F.T.)</td>
<td>$N_1$ $P_1 \quad P_2 \quad N_1P_1 \quad N_2P_1 \quad N_2P_2 \quad N_1P_2K_2$</td>
<td>S.E.</td>
</tr>
<tr>
<td>Control yield = 892 Kg/ha.</td>
<td>27.4</td>
<td></td>
</tr>
<tr>
<td>No. of trials = 18.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65 (S.F.T.)</td>
<td>$N_1$ $P_1 \quad P_2 \quad N_1P_1 \quad N_2P_1 \quad N_2P_2 \quad N_1P_2K_2$</td>
<td>S.E.</td>
</tr>
<tr>
<td>Control yield = 1078 Kg/ha.</td>
<td>07.6</td>
<td></td>
</tr>
<tr>
<td>No. of trials = 13.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sriganganagar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>62 (S.F.T.)</td>
<td>$N_1$ $P_1 \quad P_2 \quad N_1P_1 \quad N_2P_1 \quad N_2P_2 \quad N_1P_2K_2$</td>
<td>S.E.</td>
</tr>
<tr>
<td>Control yield = 1021 Kg/ha.</td>
<td>71.5</td>
<td></td>
</tr>
<tr>
<td>No. of trials = 8.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>63 (S.F.T.)</td>
<td>$N_1$ $P_1 \quad P_2 \quad N_1P_1 \quad N_2P_1 \quad N_2P_2 \quad N_1P_2K_2$</td>
<td>S.E.</td>
</tr>
<tr>
<td>Control yield = 1145 Kg/ha.</td>
<td>49.3</td>
<td></td>
</tr>
<tr>
<td>No. of trials = 7.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>64 (S.F.T.)</td>
<td>$N_1$ $P_1 \quad P_2 \quad N_1P_1 \quad N_2P_1 \quad N_2P_2 \quad N_1P_2K_2$</td>
<td>S.E.</td>
</tr>
<tr>
<td>Control yield = 1221 Kg/ha.</td>
<td>72.0</td>
<td></td>
</tr>
<tr>
<td>No. of trials = 8.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65 (S.F.T.)</td>
<td>$N_1$ $P_1 \quad P_2 \quad N_1P_1 \quad N_2P_1 \quad N_2P_2 \quad N_1P_2K_2$</td>
<td>S.E.</td>
</tr>
<tr>
<td>Control yield = 1091 Kg/ha.</td>
<td>17.5</td>
<td></td>
</tr>
<tr>
<td>No. of trials = 9.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Crop: Wheat

### Site: (District) Banswara

Object: To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients (Type: A2).

#### Basal Conditions:
- (i) N.A.
- (ii) Red and yellow.
- (iii) to (vi) N.A.
- (vii) Unirrigated.
- (viii) to (x) N.A.

#### Design:
Same as in type A1 (Irrigated) on page 67.

### General:
- (i) to (iii) N.A.
- (iv) (a) 1962 only.
- (b) and (c) N.A.
- (v) to (vii) N.A.
5. RESULTS:

62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>P_1</th>
<th>P_2</th>
<th>N_1P_1</th>
<th>N_1P_2</th>
<th>N_2P_2</th>
<th>N_2P_1K_2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>209</td>
<td>327</td>
<td>403</td>
<td>347</td>
<td>268</td>
<td>571</td>
<td>510</td>
<td>171.7</td>
</tr>
</tbody>
</table>

Control yield=614 Kg/ha.; No. of trials=4.

Crop :- Wheat (Rabi).

Site :- (District) : Banswara, Sriganganagar, Pali and Kota.

Type :- ‘M.’

Object :- To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients (Type: A_3).

1. BASAL CONDITIONS:
   (i)- (a) to (c) N.A. (ii) Red and yellow; Desert soil; Grey brown and Red and black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   8 manurial treatments
   O = Control (no manure).
   N_1 =33:6 Kg/ha. of N.
   K_1 =33:6 Kg/ha. of K_2O.
   K_2 =67:2 Kg/ha. of K_2O.
   N_1K_1 =33:6 Kg/ha. of N+33:6 Kg/ha. of K_2O.
   N_1K_2 =33:6 Kg/ha. of N+67:2 Kg/ha. of K_2O.
   N_2K_1 =67:2 Kg/ha. of N+67:2 Kg/ha. of K_2O.
   N_1P_1K_1 =33:6 Kg/ha. of N+33:6 Kg/ha. of P_2O_5 +33:6 Kg/ha. of K_2O.
   N_1 applied as A/S, P_2O_5 as Super and K_2O as Mur. of Pot.

3. DESIGN:
   Same as in type A_1 (Irrigated) on page 67.

4. GENERAL:
   (i) to (iii) N.A. (iv) (a) 1962—1966. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

Banswara

62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>K_1</th>
<th>K_2</th>
<th>N_1K_1</th>
<th>N_1K_2</th>
<th>N_2K_2</th>
<th>N_1P_1K_1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>394</td>
<td>284</td>
<td>203</td>
<td>670</td>
<td>637</td>
<td>720</td>
<td>728</td>
<td>136.8</td>
</tr>
</tbody>
</table>

Control yield=848 Kg/ha.; No. of trials=7.

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>K_1</th>
<th>K_2</th>
<th>N_1K_1</th>
<th>N_1K_2</th>
<th>N_2K_2</th>
<th>N_1P_1K_1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>210</td>
<td>92</td>
<td>200</td>
<td>242</td>
<td>457</td>
<td>528</td>
<td>494</td>
<td>144.2</td>
</tr>
</tbody>
</table>

Control yield=604 Kg/ha.; No. of trials=6.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>K_1</th>
<th>K_2</th>
<th>N_1K_1</th>
<th>N_1K_2</th>
<th>N_2K_2</th>
<th>N_1P_1K_1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>32</td>
<td>204</td>
<td>230</td>
<td>625</td>
<td>533</td>
<td>467</td>
<td>507</td>
<td>328.1</td>
</tr>
</tbody>
</table>

Control yield=1074 Kg/ha.; No. of trials=3.
### Sriganganagar (62 S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. response of grain in Kg/ha.</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₂K₂</th>
<th>N₃P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁K₁</td>
<td>308</td>
<td>41</td>
<td>116</td>
<td>381</td>
<td>413</td>
<td>709</td>
<td>612</td>
</tr>
</tbody>
</table>

Control yield = 961 Kg/ha.; No. of trials = 9.

### Pali (62 S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. response of grain in Kg/ha.</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₂K₂</th>
<th>N₃P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁K₁</td>
<td>231</td>
<td>1</td>
<td>69</td>
<td>264</td>
<td>290</td>
<td>535</td>
<td>430</td>
</tr>
</tbody>
</table>

Control yield = 1016 Kg/ha.; No. of trials = 9.

### 63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. response of grain in Kg/ha.</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₂K₂</th>
<th>N₃P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁K₁</td>
<td>296</td>
<td>80</td>
<td>45</td>
<td>300</td>
<td>319</td>
<td>541</td>
<td>408</td>
</tr>
</tbody>
</table>

Control yield = 887 Kg/ha.; No. of trials = 12.
<table>
<thead>
<tr>
<th>Crop: - Wheat (Rabi).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site: (District): Banswara and Kota.</td>
</tr>
<tr>
<td>Type: - 'M'.</td>
</tr>
</tbody>
</table>

Object: - To study response curves of important cereal cash and oilseed crops to Potash applied singly and combination with other nutrients (Type : A3). 

1. BASAL CONDITIONS:
   (i) N.A. (ii) Red and yellow; Red and black. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   8 manurial treatments

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&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;K&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>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>183</td>
<td>104</td>
<td>194</td>
<td>241</td>
<td>285</td>
<td>386</td>
<td>267</td>
</tr>
<tr>
<td>Control yield = 860 Kg/ha.; No. of trials = 15.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Kota

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&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;K&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>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>299</td>
<td>64</td>
<td>109</td>
<td>346</td>
<td>301</td>
<td>493</td>
<td>531</td>
</tr>
<tr>
<td>Control yield = 599 Kg/ha.; No. of trials = 10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

63(S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&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;K&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>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>204</td>
<td>104</td>
<td>202</td>
<td>346</td>
<td>352</td>
<td>622</td>
<td>613</td>
</tr>
<tr>
<td>Control yield = 611 Kg/ha.; No. of trials = 11.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&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;K&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>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>207</td>
<td>109</td>
<td>126</td>
<td>271</td>
<td>314</td>
<td>463</td>
<td>472</td>
</tr>
<tr>
<td>Control yield = 621 Kg/ha.; No. of trials = 12.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

65(S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&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;K&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>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>117</td>
<td>56</td>
<td>84</td>
<td>200</td>
<td>251</td>
<td>354</td>
<td>310</td>
</tr>
<tr>
<td>Control yield = 567 Kg/ha.; No. of trials = 10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. DESIGN:
   Same as in type A (Irrigated) on page 67.

4. GENERAL:
   (i) to (iii) N.A.  (iv) (a) 1962 only.  (b) and (c) N.A.  (v) to (vii) N.A.

5. RESULTS:

   Banswara

   62 (S.F.T.)

   Treatment
   \[ N_1 \quad K_1 \quad K_2 \quad N_1K_1 \quad N_1K_2 \quad N_1K_3 \quad N_1P_1K_1 \quad S.E. \]

   Av. response of
grain in Kg/ha.
   
   98  -14  -9  103  153  266  197  36 2

   Control yield=494 Kg/ha ; No. of trials=2.

   Kota

   62 (S.F.T.)

   Treatment
   \[ N_1 \quad K_1 \quad K_4 \quad N_1K_1 \quad N_1K_4 \quad N_1K_2 \quad N_1P_1K_1 \quad S.E. \]

   Av. response of
grain in Kg/ha.
   
   81  171  160  138  207  322  413  —

   Control yield=496 Kg/ha ; No. of trials=1.

   Crop :- Wheat (Rabi).
   Site :- As per results.

   Ref :- Rj. 60(SFT) 61(SFT).

   Type :- ‘M’.

   Type A :- To study the response of Wheat to levels of N, P and K individually and combination.

1. BASAL CONDITIONS:
   (i) N.A.  (ii) As per results.  (iii) to (vi) N.A.  (vii) Irrigated.  (viii) to (x) N.A.

2. TREATMENTS:

   O=Control (no manure)
   \[ n=22.4 \quad Kg/ha. \quad of \quad N \]
   \[ p=22.4 \quad Kg/ha. \quad of \quad P_2O_5 \]
   \[ k=22.4 \quad Kg/ha. \quad of \quad K_2O \]
   \[ np=22.4 \quad Kg/ha. \quad of \quad N+22.4 \quad Kg/ha. \quad of \quad P_2O_5 \]
   \[ nk=22.4 \quad Kg/ha. \quad of \quad N+22.4 \quad Kg/ha. \quad of \quad K_2O \]
   \[ pk=22.4 \quad Kg/ha. \quad of \quad P_2O_5+22.4 \quad Kg/ha. \quad of \quad K_2O \]
   \[ n,k=22.4 \quad Kg/ha. \quad of \quad N+22.4 \quad Kg/ha. \quad of \quad P_2O_5+22.4 \quad Kg/ha. \quad of \quad K_2O \]
   N applied as A’S ; P_2O_5 as S. All and K_2O as M tr. of Pot.

3. DESIGN:

   (i) and (ii) Each district has been divided into four agriculturally homogeneous zones and one field assistant
   posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and
   the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31
   trials in a year 8 on kharif cereal, 8 on a rabi cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a legume-
   nous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than
   the legumes. The three trials on legumes are of Type C. Residual effects of phosphate application are
   studied on Type C trials in two out of the four zones in each district every year. The experiments are laid
   out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experi-
   ment per village.  (iii) (a) 98.8 ha.  (b) 197.7 ha. (iv) Yes.

4. GENERAL:

   (i) to (vii) N.A.
Crop: Wheat (Rabi).

Site: As per results.

Ref: Rj. 60, 61(S.F.T).

Type: ‘M’.

Object: To study the response of Wheat to levels of N, P and K applied individually and in combination. (Type: A).

1. BASAL CONDITIONS:
(i) N.A. (ii) As per results. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS and DESIGN:
Same as in 60(S.F.T.) on page 76.

4. GENERAL:
(i) to (vii) N.A.

5. RESULTS:

Crop: Wheat (Rabi).

Site: As per results.

Ref: Rj. 60, 61 (S.F.T.).

Type: ‘M’.

Object: To investigate the relative efficiency of different nitrogenous fertilizers at different doses (Type: B).
1. BASAL CONDITIONS:
(i) N.A.  (ii) As per results.  (iii) to (vi) N.A.  (vii) Irrigated.  (viii) to (x) N.A.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>District</th>
<th>Soil class</th>
<th>No. of trials</th>
<th>O</th>
<th>n₁</th>
<th>n₂</th>
<th>n₃'</th>
<th>n₄'</th>
<th>n₅''</th>
<th>n₆''</th>
<th>G.M.</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banswara</td>
<td>Red and black</td>
<td>5</td>
<td>1140</td>
<td>1830</td>
<td>1800</td>
<td>1440</td>
<td>1560</td>
<td>1420</td>
<td>1570</td>
<td>1537</td>
<td>50'0</td>
</tr>
<tr>
<td>Kota</td>
<td>Black</td>
<td>4</td>
<td>750</td>
<td>930</td>
<td>1090</td>
<td>1060</td>
<td>1180</td>
<td>1000</td>
<td>1120</td>
<td>1019</td>
<td>77'1</td>
</tr>
<tr>
<td>Pali</td>
<td>Desert</td>
<td>11</td>
<td>1160</td>
<td>1370</td>
<td>1620</td>
<td>1340</td>
<td>1500</td>
<td>1340</td>
<td>1670</td>
<td>1429</td>
<td>54'4</td>
</tr>
<tr>
<td>Sriganga—nagar</td>
<td>Desert</td>
<td>12</td>
<td>1093</td>
<td>1490</td>
<td>1730</td>
<td>1300</td>
<td>1550</td>
<td>1470</td>
<td>1780</td>
<td>1487</td>
<td>43'1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>District</th>
<th>soil class</th>
<th>No. of trials</th>
<th>O</th>
<th>n₁</th>
<th>n₂</th>
<th>n₃'</th>
<th>n₄'</th>
<th>n₅''</th>
<th>n₆''</th>
<th>G.M.</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banswara</td>
<td>Red and black</td>
<td>3</td>
<td>770</td>
<td>1100</td>
<td>1240</td>
<td>1320</td>
<td>1560</td>
<td>—</td>
<td>1130</td>
<td>1560</td>
<td>1240</td>
</tr>
<tr>
<td>Pali</td>
<td>Desert</td>
<td>20</td>
<td>1240</td>
<td>1580</td>
<td>1720</td>
<td>1450</td>
<td>1620</td>
<td>—</td>
<td>1610</td>
<td>1820</td>
<td>1577</td>
</tr>
<tr>
<td>Sriganga—nagar</td>
<td>Desert</td>
<td>10</td>
<td>1230</td>
<td>1540</td>
<td>1720</td>
<td>1390</td>
<td>1520</td>
<td>—</td>
<td>1530</td>
<td>1800</td>
<td>1533</td>
</tr>
<tr>
<td>Kota</td>
<td>M. black</td>
<td>3</td>
<td>870</td>
<td>1100</td>
<td>1110</td>
<td>1050</td>
<td>1260</td>
<td>860</td>
<td>1150</td>
<td>—</td>
<td>1057</td>
</tr>
</tbody>
</table>

Crop : Wheat (Rabi).  
Site :- As per results.  
Ref :- Rj. 61(SFT).  
Type :- 'M'.

Object :- Type B.

1. BASAL CONDITIONS:
(i) N.A.  (ii) As per results.  (iii) to (vi) N.A.  (vii) Unirrigated.  (viii) to (x) N.A.

2. TREATMENTS:

O = Control (no manure)

<table>
<thead>
<tr>
<th>District</th>
<th>Soil class</th>
<th>No. of trials</th>
<th>O</th>
<th>n₁</th>
<th>n₂</th>
<th>n₃'</th>
<th>n₄'</th>
<th>n₅''</th>
<th>n₆''</th>
<th>G.M.</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banswara</td>
<td>Red and black</td>
<td>5</td>
<td>1140</td>
<td>1830</td>
<td>1800</td>
<td>1440</td>
<td>1560</td>
<td>1420</td>
<td>1570</td>
<td>1537</td>
<td>50'0</td>
</tr>
<tr>
<td>Kota</td>
<td>Black</td>
<td>4</td>
<td>750</td>
<td>930</td>
<td>1090</td>
<td>1060</td>
<td>1180</td>
<td>1000</td>
<td>1120</td>
<td>1019</td>
<td>77'1</td>
</tr>
<tr>
<td>Pali</td>
<td>Desert</td>
<td>11</td>
<td>1160</td>
<td>1370</td>
<td>1620</td>
<td>1340</td>
<td>1500</td>
<td>1340</td>
<td>1670</td>
<td>1429</td>
<td>54'4</td>
</tr>
<tr>
<td>Sriganga—nagar</td>
<td>Desert</td>
<td>12</td>
<td>1093</td>
<td>1490</td>
<td>1730</td>
<td>1300</td>
<td>1550</td>
<td>1470</td>
<td>1780</td>
<td>1487</td>
<td>43'1</td>
</tr>
</tbody>
</table>
3. DESIGN:
Same as in type A on page 76.

4. GENERAL:
(i) to (vii) N.A.

5. RESULTS:

1960

<table>
<thead>
<tr>
<th>District</th>
<th>Soil class</th>
<th>No. of trials</th>
<th>O</th>
<th>n1</th>
<th>n2</th>
<th>n3</th>
<th>n4</th>
<th>n5</th>
<th>n6</th>
<th>G.M.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banswara</td>
<td>Red black</td>
<td>4</td>
<td>610</td>
<td>950</td>
<td>900</td>
<td>790</td>
<td>1070</td>
<td>920</td>
<td>1070</td>
<td>901</td>
<td>142.1</td>
</tr>
<tr>
<td>Kota</td>
<td>Black</td>
<td>6</td>
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<td>450</td>
<td>600</td>
<td>500</td>
<td>540</td>
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<td>420</td>
<td>484</td>
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1961

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<th>No. of trials</th>
<th>O</th>
<th>n1</th>
<th>n2</th>
<th>n3</th>
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<th>n5</th>
<th>n6</th>
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<th>S.E.</th>
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<td>500</td>
<td>480</td>
<td>510</td>
<td>630</td>
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**Crop:** Wheat *(Rabi).*  
**Site:** Govt. Agri. Farm, Bundi.  
**Ref:** Rj. 61(101), 62(63).  
**Type:** 'MV.'

Object: To find out the loss in weight due to rust by application of fertilizers on different varieties of Wheat.

1. **BASAL CONDITION:**
   (i) (a) N.A. (b) Maize for 61(101); Fallow for the other. (c) N.A. for 61(101); Nil for the other. (ii) N.A. (iii) 17.11.1961; 22.11.1962. (iv) 2 ploughings and 2 bakherings for 61(101); 3 bakherings and pata for 62(61) (b) N.A. (c) 62 Kg/ha; 92 Kg/ha. (d) 30 cm between rows. (e) N.A. (v) N.A. (iv) As per treatments. (vii) Irrigated (viii) 2 to 3 weedings. (ix) N.A. (x) N.A. for 61 (101); 8.4.1963.

2. **TREATMENTS:**

**Main-plot treatments:**
- 2 varieties: \( V_1 = N.P.-718 \) and \( V_2 = \text{Local.} \)

**Sub-plot treatments**
- All combinations of (1), (2) and (3).
  1. 3 levels of N: \( N_0 = 0 \), \( N_1 = 67.2 \) and \( N_2 = 134.4 \) Kg/ha.
  2. 2 levels of \( P_2 \): \( P_0 = 0 \) and \( P_1 = 67.2 \) Kg/ha.
  3. 2 levels of \( K_2 \): \( K_0 = 0 \) and \( K_1 = 67.2 \) Kg/ha.

3. **DESIGN:**
   (i) Split-plot. (ii) (a) 2 main-plots/repetition; 12 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6.1 m. \( \times 3.1 \) m for 61(101); 4.6 m. \( \times 3.1 \) m for 62(63). (b) 5.5 m. \( \times 2.4 \) m. for 61(101); 4.0 m. \( \times 2.4 \) m. for 62(63), (b) 30 cm. \( \times 30 \) cm. (vi) Yes.

4. **GENERAL:**
   (i) N.A. (ii) Rust attack for 61(101) control measures N.A.; N.A. for 62(63). (iii) Yield of grain and fodder. (iv) (a) 1961 to 1962. (b) N.A. (c) Results of combined analysis given under 5. Results. (v) and (vi) N.A. (vii) Both main-plot and sub-plot error variances are homogeneous, main-plot Treatments \( \times \) years interaction is absent, while Sub-plot Treatments \( \times \) years interaction is present.

5. **RESULTS:**
   (i) 267 Kg/ha. (ii) (a) 1901.6 Kg/ha. (7 d.f. made up of main-plot Treatments \( \times \) years interaction and pooled error). (b) 1179 Kg/ha. (based on 13 d.f. made up of interaction of various components of treatment with years). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
Crop : Wheat (Rabi).

Site : Govt. Agri. Res Farm, Borkhera.

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

1. BASAL CONDITIONS:
   (i) (a) Gram-Wheat-Fallow-Wheat.
   (b) Fallow.
   (c) Nil.
   (ii) Medium clay soil.
   (iii) 1.11.62.
   (iv) (a) 2 ploughings and 2 bakherings.
   (b) Drilling.
   (c) 92 kg/ha.
   (d) Row to row 30 cm.
   (e) N.A.
   (f) As per treatments.
   (vii) Unirrigated.
   (viii) Nil.
   (ix) N.A.
   (x) 16.3.63.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 5 varieties: V₁ = Malvi, V₂ = E.K.-S9, V₃ = Hy-65, V₄ = N.P.-718 and V₅ = N.Ill
   (2) 2 methods of applications of 22.4. Kg/ha. of N: M₁ = Basal dressing and M₂ = Foliar spray

3. DESIGN:
   (i) Fact. in R.B.D.
   (ii) Nil.
   (iii) 2.
   (iv) (a) 6.0 m. x 6.1 m.
   (b) 7.4 m. x 5.5 m.
   (v) 30 cm x 30 cm.
   (vi) Yes.

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

5. RESULTS:
   (i) 733 Kg/ha.
   (ii) 207 Kg/ha.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>V₅</th>
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</thead>
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<td>723</td>
<td>711</td>
<td>600</td>
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<td>M₂</td>
<td>1094</td>
<td>791</td>
<td>637</td>
<td>538</td>
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<td>1014</td>
<td>757</td>
<td>674</td>
<td>569</td>
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</tr>
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</table>

Crop : Wheat (Rabi).

Site : Govt. Agri. Res. Farm, Sriganganagar.

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

Ref. :- Rj. 62(54).

Type :- ‘MV’.

Ref. :- Rj. 64(57).

Type :- ‘MV’.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 29.10.64. (iv) (a) 4 ploughings. (b) Behind the
   plough. (c) 74 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii)
   3 hoeings with hand hoe. (ix) 1 cm. (x) 23.4.65.

2. TREATMENTS:
   Main-plot treatments:
   3 varieties: $V_1 = C-591$, $V_2 = N.P. 825$ and $V_3 = C-281$.

   Sub-plot treatments:
   10 manurial treatments: $M_0 = \text{Control}$, $M_1 = \text{N.P. 285}$ and $M_5 = \text{N.P. 285}$.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication, 10 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 5.5 m. x
   3.7 m. (b) 5.0 m. x 3.1 m. (v) 23 cm. x 30 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964 only. (b) — (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2049 Kg/ha. (ii) (a) 874'6 Kg/ha. (b) 288'7 Kg/ha. (iii) Main effect of M alone is highly significant.
   (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$M_0$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
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<td>1816</td>
<td>2316</td>
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<td>2675</td>
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<tr>
<td>$V_2$</td>
<td>1446</td>
<td>1816</td>
<td>1946</td>
<td>1753</td>
<td>1816</td>
<td>2065</td>
<td>2316</td>
<td>1935</td>
<td>2011</td>
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<td>$V_3$</td>
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<td>2105</td>
<td>2240</td>
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<tr>
<td>Mean</td>
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<td>1846</td>
<td>2120</td>
<td>1891</td>
<td>2124</td>
<td>2062</td>
<td>2142</td>
<td>2087</td>
<td>2236</td>
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</table>

C.D. for M marginal means = 274'1 Kg/ha.

_Crop :- Wheat._

_Site :- Govt. Agri. Res. Farm, Sriganganagar._

Ref :- Rj. 65(34).

_Type :- 'MV'._

Object :- To see the effect of N on the yield of different varieties of Wh eat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 21.11.65. (iv) (a) Ploughing. (b) Behind the
   plough. (c) 86 Kg/ha. (d) 23 cm. between rows. (e) — (v) N.A. (vi) As per treatments. (vii) Irrigated.
   (viii) 3 hand hoeings. (ix) N.A. (x) 15.4.66.

2. TREATMENTS:
   Main-plot treatments:
   6 levels of N: $N_0 = 0$, $N_1 = 40$, $N_2 = 80$, $N_3 = 120$, $N_4 = 160$ and $N_5 = 200$ Kg/ha.

   Sub-plot treatments:
   2 varieties: $V_1 = \text{Sonara 64}$ and $V_2 = \text{Lerma Roja}$. 
3. **DESIGN:**
   (i) Split-plot.  (ii) (a) 6 main-plots/replication, 2 sub-plots/main-plot.  (b) N.A.  (iii) 6.  (iv) (a) 1.4 m. × 10.0 m.  (b) 0.5 m. × 8.0 m.  (v) 46 cm. × 100 cm.  (vi) Yes.

4. **GENERAL:**
   (i) Good.  (ii) Nil.  (iii) Yield of grain.  (iv) (a) 1965 contd.  (b) No.  (c) Nil.  (v) to (vii) N.A.

5. **RESULTS:**
   (i) 2201 Kg/ha.  (ii) (a) 485.3 Kg/ha.  (b) 182.1 Kg/ha.  (iii) Main effect of N and interaction N×V are significant.  (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>N₂</th>
<th>N₁</th>
<th>N₄</th>
<th>N₃</th>
<th>N₅</th>
<th>N₆</th>
<th>Mean</th>
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<td>2615</td>
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<td>2160</td>
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<td>2312</td>
<td>2201</td>
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</tbody>
</table>

C.D. for N marginal means = 408.1 Kg/ha.
C.D. for V means at the same level of N = 215.0 Kg/ha.
C.D. for N means at the same level of V = 436.7 Kg/ha.

---

**Crop:** Wheat (*Rabi*).

**Site:** Govt. Agri. Res. Farm, Sultanpur.

**Type:** 'MV'.

Object: To find out the suitable manurial schedule for different varieties of Wheat.

1. **BASAL CONDITIONS:**
   (i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) Black Cotton soil.  (iii) 18.10.1962, 26.10.1963, 20.10.1964.  (iv) (a) 2 ploughings and 3 bakherings.  (b) Line sowing for 62(77), behind the plough for 63(51), Drilling for 64(69).
   (c) 99 Kg/ha. for 62(77), 74 Kg/ha. for 63(51), 74 Kg/ha. for 64(69).  (d) 30 cm. between rows.  (e) N.A.  (v) Nil.  (vi) As per treatments.  (vii) Irrigated.  (viii) 1 hoeing and 1 weeding.  (ix) N.A. for 62(77), 63(51); Nil for 64(69).  (x) 17.4.63, 15.4.64, 10.4.1965.

2. **TREATMENTS:**
   **Main-plot treatments:**
   2 varieties: V₁ = C-591 and V₂ = N.P. 718.

   **Sub-plot treatments:**
   10 manurial treatments:
   - M₅ = Control, M₄ = 44.8 Kg/ha. of N, M₃ = 89.7 Kg/ha. of N, M₂ = 134.5 Kg/ha. of N, M₁ = 44.8 Kg/ha. of N + 22.4 Kg/ha. of P₂O₅, M₀ = M₁ + 44.8 Kg/ha. of P₂O₅, M₃ = M₄ + 44.8 Kg/ha. of P₂O₅, M₅ = M₆ + 89.7 Kg/ha. of P₂O₅, M₆ = M₇ + 67.2 Kg/ha. of P₂O₅, M₇ = M₈ + 134.5 Kg/ha. of P₂O₅.

   N as A/S broadcast at sowing and at first irrigation.  P₂O₅ as Super drilled at sowing.

3. **DESIGN:**
   (i) Split-plot.  (ii) (a) 2 main-plots/replication and 10 sub-plots/main-plot.  (b) 17.7 m. × 9.8 m.  (iii) 4.  (iv) (a) 4.6 m. × 3.1 m.  (b) 4.0 m. × 2.4 m.  (v) 30 cm. × 30 cm.  (vi) Yes.

4. **GENERAL:**
   (i) Good.  (ii) Nil.  (iii) Height, stand and yield of grain.  (iv) (a) 1962 to 64.  (b) No.  (c) Nil.  (v) and (vi) Nil.  (vii) Since the sub-plot error variances are heterogeneous results of individual years are presented under 5. Results.
5. RESULTS:

62(77)

(i) 2502 Kg/ha. (ii) (a) 1202.0 Kg/ha. (b) 726.1 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
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<td>V₂</td>
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</table>

C.D. for M marginal means=729.5 Kg/ha;

63(51)

(i) 2250 Kg/ha. (ii) (a) 462.0 Kg/ha. (b) 689.0 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
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</tbody>
</table>

C.D. for M marginal means=691.4 Kg/ha;

64(69)

(i) 2890 Kg/ha. (ii) (a) 581.0 Kg/ha. (b) 332.3 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
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<td>3552</td>
<td>3558</td>
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</table>

C.D. for M marginal means=333.6 Kg/ha.

Crop :- Wheat (Rabi).  
Site :- M.A.E. Centre, Sumerpur.  
Ref :- Rj. 64(M.A.E).  
Type :- 'MV'.

Object :- Type V(a) :- To study the effect of different methods of application of N on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) and (b) N.A. (c) Nil. (ii) Sandy loam. (iii) 17.11.1964. (iv) (a) to (e) N.A. (v) 33-6 Kg/ha. of P₂O₅ as Super. (vi) R.S.311 (13 days). (vii) Irrigated; (viii) and (k) N.A.:- (x) 23.3.1965.

2. TREATMENTS:
All combinations of (1) and (2) with a control
(1) 3 levels of N as A/S : N₁=33-6, N₂=50 4 and N₃=67-2 Kg/ha.
(2) 3 methods of application : M₁=Broadcast at sowing, M₂=Drilled 6 cm. below the seed and M₃= Band placement 5 to 7.5 cm. on either side of seed.
3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a), (b) and (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964-1966 (1965 N.A). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 976 Kg/ha. (ii) 305.8 Kg/ha. (iii) “Control vs. others” alone is highly significant. (iv) Av. yield of grain in Kg/ha.

   Control=438 Kg/ha.

   \[
   \begin{array}{|c|c|c|c|}
   \hline
   & N_1 & N_2 & N_3 \\
   \hline
   M & 877 & 1119 & 1289 \\
   Na & 905 & 933 & 992 \\
   M_1 & 1028 & 1020 & 1162 \\
   \hline
   \text{Mean} & 937 & 1024 & 1147 \\
   \hline
   \end{array}
   \]

   C.D. for control vs. others=330.7 Kg/ha.

---

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

**Site :- Reg. Res. Sta., Berwal, Banswara.**

Ref :- Rj. 65(27).

Type :- ‘C’.

Object :-To find out the optimum seed rate, row spacings and number of bakherings required for irrigated Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Groundnut. (c) N.A. (ii) Black Cotton. (iii) 9.12.65. (iv) (a) As per treatments. (b) Behind the plough. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) R.S 31-1 (medium). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 1 to 3.4.1966.

2. TREATMENTS:
   Main-plot treatments :
   3 levels of bakherings : B_1=2, B_2=4 and B_3=6.
   Sub-plot treatments :
   3 sprayings between rows : S_1=24, S_2=30 and S_3=36 cm.
   Sub-sub-plot treatments :
   3 seed rates : R_1=75, R_2=100 and R_3=125 Kg/ha.

3. DESIGN:
   (i) Split plot. (ii) (a) 3 main-plots/replication, 3 sub-plots/main-plot, 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 5.4 m. x 3.0 m. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Height, tillers, earlength and yield of grain. (iv) (a) 1965 contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1580 Kg/ha. (ii) (a) 391.4 Kg/ha. (b) 337.9 Kg/ha. (c) 317.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
Crop: - Wheat (Rabi).  
Site: - Govt. Agri. Farm, Bilwara.  
Object: - To find out the optimum seed rate for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Fallow-Wheat. (b) Fallow. (c) Nil. (ii) N.A. (iii) October, 1960. (iv) (a) 3 ploughings. (b) N.A. (c) As per treatments. (d) 23 cm. between rows. (e) N.A. (v) 22.4 Kg/ha. of P₂O₅. (vi) R.S. 31-1. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1961.

2. TREATMENTS:
   8 seed rates: S₁ = 58, S₂ = 69, S₃ = 81, S₄ = 92, S₅ = 104, S₆ = 115, S₇ = 127 and S₈ = 138 Kg/ha.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 9:1 m. x 5:5 m. (b) 8:5 m. x 4:6 m. (v) 30 cm. x 46 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 only. (b) - . (c) Nil. (v) to (vii) N.A.

5. RESULTS:
   (i) 1167 Kg/ha. (ii) (a) 220.9 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
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<td>C.D.</td>
<td>258.8 Kg/ha.</td>
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Crop: - Wheat (Rabi).  
Site: - Govt. Agri. Res. Farm, Borekhera.  
Object: - To study the effect of different seed rates and different dates of sowing on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Fallow, Wheat for 60(74), N.A. for 61(95). (b) Fallow. (c) N.A. (ii) Black soil. (iii) A : 1 protections. (iv) (a) 2-3 ploughings and 3 bakherings. (b) Drilling. (c) As per treatments. (d) 30 cm. between rows. (e) N.A. (v) N.A. for 60(74), 17:8 Kg/ha. of N as A/S + 22:2 Kg/ha of P₂O₅ as Super for 61(95). (vi) C-591 for 60(74) and N.P. 718 for 61(95). (vii) Irrigated. (viii) 1-2 weedings. (ix) and (x) N.A.
2. **TREATMENTS:**

**Main-plot treatments:**

**60(74):**


**61(95):**


**Sub-plot treatments:**

- 8 seed rates: $S_1 = 46$, $S_2 = 58$, $S_3 = 69$, $S_4 = 81$, $S_5 = 92$, $S_6 = 104$, $S_7 = 115$ and $S_8 = 127$ Kg/ha.

3. **DESIGN:**

(i) Split-plot. (ii) (a) 4 main-plots/replication, 8 sub-plots/main-plot for 60(74) and 6 main-plots/replication, 8 sub-plots/main-plot for 61(95). (b) N.A. (iii) 2. (iv) (a) 7.3 m. x 5.5 m. for 61(95), N.A. for 60(74). (b) 60.4 m. x 4.6 m. for 61(95), 7.3 m. x 5.5 m. for 60(74). (v) N.A. for 60(74), 46 cm. x 46 cm. for 61(95). (vi) Yes.

4. **GENERAL:**

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960 to 1963 (modified). (b) No. (c) Nil. (v) and (vi) N.A. (vii) Treatments are modified in 1961 and again in 1962. Results of 1962 and 63 are combined and presented.

5. **RESULTS:**

**60(74):**

(i) 787 Kg/ha. (ii) (a) 895.3 Kg/ha. (b) 266.5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<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>
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<td>870</td>
<td>682</td>
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**61(95):**

(i) 1788 Kg/ha. (ii) (a) 510.8 Kg/ha. (b) 358.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$S_1$</th>
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**Crop:** Wheat (Rabi).

**Site:** Govt. Agri. Res. Farm, Borkhera.

**Type:** ‘C’.

**Object:** To find out the optimum date of sowing and seed rate for Wheat crop.
1. BASAL CONDITIONS:
   (i) (a) Linseed-Fallow-Wheat for 62(82), Nil for 63(50). (b) Fallow. (c) Nil. (ii) Black soil. (iii) As per treatments. (iv) (a) 1 ploughing, 2 discings and 1 planking. (b) Sowing in lines behind the plough. (c) As per treatments. (d) 30 cm. between rows. (e) N.A. (f) N.A. for 62(82), 44·8 Kg/ha. of N as A/S+44·8 Kg/ha. of P₂O₅ as Super at sowing for 63(50). (g) N.A. (h) N.A., 2 to 13.4.1964.

2. TREATMENTS:
   Main-plot treatments:
   Sub-plot treatments:
   8 seed rates: R₁ = 46, R₂ = 58, R₃ = 69, R₄ = 81, R₅ = 92, R₆ = 104, R₇ = 115 and R₈ = 127 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 8 main-plots/replication, 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 7·3 m. x 5·5 m. (b) 6·7 m. x 4·9 m. (v) 30 em. x 30 em. (vi) Yes.

4. GENERAL:
   (i) Normal but crop lodged for 62(82), Good for 63(50). (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1960 to 63 (treatments modified in 1961 and 62). (b) No. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil. (vii) Results of 1960 and 61 are presented separately. Both the error variances are homogeneous, interaction of main-plot and sub-plot Treatments with years are absent.

5. RESULTS:
   (i) 2653 Kg/ha. (ii) (a) 251·1 Kg/ha. [based on 21 d.f. made up of Treatments x years interaction and pooled error]. (b) 317·9 Kg/ha. [based on 168 d.f. made up of interactions of various components of Treatments with years and pooled error]. (iii) Main effects of D and R are highly significant and interaction D x R is significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>R₅</th>
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<td>2954</td>
<td>2964</td>
<td>3034</td>
<td>2982</td>
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</tbody>
</table>

C.D. for D marginal means = 130·6 Kg/ha.
C.D. for R marginal means = 155·8 Kg/ha.
C.D. for R means at the same level of D = 440·6 Kg/ha.
C.D. for D means at the same level of R = 43·4 Kg/ha.

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Dhakerkhedi.
Ref :- Rj. 61(96), 62(56).
Type :- 'C'.
Object :- To study the effect of row direction and different spacings on the yield of Wheat.
1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Wheat for 61(96), Fallow for the other. (c) 33·6 Kg/ha. of N+33·6 Kg/ha. of P₂O₅ for 61(96), Nil for 62(56). (ii) N.A. (iii) 14.11.1961, N.A. (iv) (a) One discing and 2 bakherings. (b) N.A. (c) 92 Kg/ha. (d) As per treatments. (e) N.A. (v) N.A. (vi) N.P.-718. (vii) Irrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   4 row directions: R₁=East to West, R₂=North to South, R₃=South West to North East and R₄=North West to South East.

   Sub-plot treatments:
   3 spacings: S₃=30, S₄=38, and S₅=46 cm.

3. DESIGN:
   (i) Split-plot. (ii) 4 main-plots/block, 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 4·6 m. × 3·1 m. for 61(96), N.A. for 62(56). (b) 3·7 m. × 2·4 m. for 61(96), 4·6 m. × 3·1 m. for 62(56). (v) 46 cm. × 30 cm. for 61(96), N.A. for 62(56). (vi) Yes.

4. GENERAL:
   (i) N.A. for 61(96), Heavy lodging for the other. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 62. (b) N.A. (v) and (vi) N.A. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS:

   61(96)
   (i) 4379 Kg/ha. (ii) (a) 1244·6 Kg/ha. (b) 829·7 Kg/ha. (iii) Main effect of S alone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
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<th>R₃</th>
<th>R₄</th>
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<td>4414</td>
<td>4379</td>
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</table>

   C.D. for S marginal means=605·4 Kg/ha.

   62(56)
   (i) 2090 Kg/ha. (ii) (a) 633·6 Kg/ha. (b) 418·4 Kg/ha. (iii) Main effect of S alone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
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   C.D. for S marginal means=305·3 Kg/ha.
Crop :- Wheat (Rabi).  
Site :- Govt. Agri. Farm, Durgapur.  
Object :- To find out the optimum number of weedings and time of weeding for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Fallow-Wheat. (b) Fallow. (c) 37 C.I./ha. of compost. (ii) Sandy loam. (iii) 4.11.61. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 20.4.62.

2. TREATMENTS:
   7 intervals of weeding : C0 = No weeding, C1 = 30, C2 = 45 days after sowing, C3 = 60 and 40, C4 = 30 and 60 and C5 = 45 and 90 days after sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 4:3:3 m. x 3:1 m. (b) 3:7:3 m. x 2:4 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) to (vii) N.A.

5. RESULTS:
   (i) 2763 Kg/ha. (ii) 5270 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Crop :- Wheat (Rabi).  
Site :- Govt. Agri. Farm, Durgapur.  
Object :- To find out the optimum seed rate for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Moong-Wheat. (b) Moong. (c) 44:8 Kg/ha. of N:44:8 Kg/ha. of P2O5. (iii) Sandy loam. (iii) 8.11.60. (iv) (a) 4 ploughings. (b) N.A. (c) As per treatments. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 29, 30.3.61.

2. TREATMENTS:
   Same as in expt. no. 60(64) conducted at Bilwara on page 85.

3. RESULTS:
   (i) 2156 Kg/ha. (ii) 4266 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Crop :- Wheat (Rabi).  
Object :- To find out the optimum seed rate and spacings for Wheat.
1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) Clay loam. (iii) N.A. for 60(79), 61(119); 17, 18.10.62 for 63(114); 13.10.63 for 63(117); 24.10.1964 for 64(104); 29.10.65 for 65(34). (iv) (a) 2 ploughings and 3 bakherings for 60(79), 61(119); ploughing and bakhering for others. (b) Behind the plough. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) Malvi. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) N.A. for 60(79), 61(119); 25.3.1963; 1, 2.4.1964; N.A. for 64(104); 28.3.66 for 65(54).

2. **TREATMENTS**:
   All combinations of (1) and (2)
   (1) 3 seed rates: \( R_1 = 37 \), \( R_2 = 74 \) and \( R_3 = 111 \) Kg/ha.
   (2) 3 row spacings: \( S_1 = 20 \), \( S_2 = 30 \) and \( S_3 = 40 \) cm.

3. **DESIGN**:
   (i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6 for expts. for 60 to 63; 4 for 64(104); 3 for 65(54).
   (iv) (a) N.A. (b) 12·5 m. x 10·0 m. (v) N.A. (vi) Yes.

4. **GENERAL**:
   (i) Good for 62(114), 63(117), 64(104) and normal for others. (ii) Nil. (iii) Yield of grain and fodder.
   (iv) (a) 1958 to 1965. (b) Yes. (c) Results of combined analysis given under 5. Results. (v) and (vi) Nil.
   (vii) Expt. for 1958 and 1959 have also been included for combined analysis. Error variances are heterogeneous, interaction of Treatments x years is present.

5. **RESULTS**:
   (i) 536 Kg/ha. (ii) 279·8 Kg/ha. (based on 56 d.f. mad up of Treatments x years interaction). (iii) Main effect of S alone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>( R_1 )</td>
<td>495</td>
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<td>559</td>
</tr>
<tr>
<td>( R_2 )</td>
<td>496</td>
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<td>509</td>
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<tr>
<td>( R_3 )</td>
<td>513</td>
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<tr>
<td>Mean</td>
<td>501</td>
<td>592</td>
<td>515</td>
<td>536</td>
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</tbody>
</table>

C.D. for S marginal means=69·7 Kg/ha.

---

**Crop :- Wheat.**

**Ref :-** Rj. 64(106), 65(56).

**Site :-** Soil Cons. Res. Demons. and Trg. Centre, Kota.

**Type :-** 'C'.

Object :- To study the effectiveness of various types of mulches on soil and moisture conservation on Wheat.

1. **BASAL CONDITIONS**:

2. **TREATMENTS**:
   5 types of mulches: \( T_0 = \text{Control}, T_1 = \text{Mulching}, T_2 = \text{Jowar stalk mulching}, T_3 = \text{Dry grass mulching and} \ T_4 = \text{Polythene mulching.}

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 12·5 m. x 10·0 m. (v) N.A. (vi) Yes.
4. GENERAL:
(i) Fair. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1964 to 1965. (b) N.A. (v) and (vi) Nil. (vii) Since the error variances are heterogeneous and the interaction of Treatments x years is absent, results of individual years are presented under 5. Results.

5. RESULTS:

64(106)
(i) 669 Kg/ha. (ii) 178-4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_0</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
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<tr>
<td>Av. yield</td>
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<td>704</td>
<td>656</td>
<td>712</td>
<td>657</td>
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</table>

65(56)
(i) 481 Kg/ha. (ii) 42-5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_0</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>380</td>
<td>480</td>
<td>514</td>
<td>538</td>
<td>492</td>
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</tbody>
</table>

C.D. = 65-3 Kg/ha.

---

**Crop :- Wheat.**

**Site :- Soil Cons. Res. Demons. & Trg. Centre, Kota.**

**Ref :- Rj. 62(112).**

**Type :- 'C'.**

Object :- To find out the suitable sowing date for Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (iii) As per treatments. (iv) (a) Ploughing, harrowing, and bakhering. (b) Behind the plough. (c) 67 Kg/ha. (d) Rows 23 cm. apart. (e) N.A. (v) Nil. (vi) Malvi. (vii) Unirrigated. (viii) 1 weeding. (ix) N.A. (x) 24.3.63.

2. TREATMENTS:
4 dates of sowing: D_1=8.10.62, D_2=20.10.62, D_3=1.11.62 and D_4=13.11.62.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 10·7 m. x 7·3 m. (b) 10·1 m. x 6·7 Y. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958-1962. (b) N.A. (c) Yes. (d) Nil. (v) and (vi) Nil. (vii) Expt. for 1960 failed and for 1961-N.A.

5. RESULTS:
(i) 386 Kg/ha. (ii) 202·6 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>D_1</th>
<th>D_2</th>
<th>D_3</th>
<th>D_4</th>
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<tr>
<td>Av. yield</td>
<td>260</td>
<td>503</td>
<td>548</td>
<td>234</td>
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</tbody>
</table>

C.D. = 248·9 Kg/ha.

---

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

**Site :- Govt. Agri. Farm, Mandore.**

**Ref :- Rj. 61(88).**

**Type :- 'C'.**

Object :- To find out the optimum number of weedings and the time of weeding for Wheat crop.
1. BASAL CONDITIONS:
(i) (a) N.A. (b) Wheat. (c) 33'6 Kg/ha. of N as A/S. (ii) Sandy loam. (iii) 20.11.61. (iv) (a) 4 ploughings and 2 cross discings. (b) Drilling. (c) 86 Kg/ha. (d) 23 cm. to 30 cm. (e) N.A. (v) N.A. (vi) R.S. 31.1. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 2.4.62.

2. TREATMENTS:
7 cultural treatments : C4=No weeding, C1=One weeding after 30 days of sowing, C2=One weeding after 45 days of sowing, C3=Two weedicings with the interval of 20 days of sowing, C4=Two weedicings with the interval of 30 days of sowing and C5=Two weedicings with the interval of 45 days of sowing.

3. DESIGN:
(i) R B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 6'1 m. x 4'6 m. (b) 5'5 m. x 4'1 m. (v) 30 cm. x 25 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1961-only. (b) No. (c) Nil. (v) to (vii) N.A. (viii) N.A. (ix) R.S. 31.1. (x) 2.4.62; 19.3.63 to 3.4.65.

5. RESULTS:
(i) 2832 Kg/ha. (ii) 342'2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
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<td>3054</td>
<td>2755</td>
<td>2812</td>
<td>2763</td>
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</table>

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Mandore.
Type :- 'C'.

Object :- To study the effect of different times of sowing and seed rates on growth and yield of Wheat crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) As per treatments. (iv) (a) 2 cross ploughings for 62(49), 1 discing and 1 palewa and ploughing for 63(61), 3 summer ploughings and 2 cross ploughings for 64(60). (b) Drilling for 62(49), behind the plough for others. (c) As per treatments. (d) 23 cm. between rows. (e) N.A. (v) 67.2 Kg/ha. of N as A/S by broadcasting and 67'2 Kg/ha. of P2O5 as Super as drilling for 62(49), N.A. for 63(61), 56 Kg/ha. of N as A/S+67'2Kg/ha. of P2O5 as Super for 64(60). (vi) R.S. 31.1. (vii) Irrigated. (viii) 2 weedings for 62(49), 63(61), N.A. for 64(60). (ix) N.A. (x) N.A., 17.3.1964; 19.3.95 to 3.4.65.

2. TREATMENTS:
Main-plot treatments :
6 dates of sowing : D1=20th Oct., D2=30th Oct., D3=10th November, D4=30th November, D5=30th November, and D6=10th Dec.
Sub-plot treatments :
6 seed rates : S1=62, S2=74, S3=87, S4=99, S5=111 and S6=124 Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/replication, 6 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 5'5 m. x 3'7 m. (b) 4'9 m. x 3'1 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) Good but heavy lodging in D3, D4 and D5 plots in 64(60) only. (ii) N.A. for 62(49), Nil for 63(61), Damage by the incidence of termites. (iii) Yield of grain and fodder. (iv) (a) 1962 to 64. (b) No. (v) and (vi) N.A. (vii) Since the sub-plot error variances are heterogeneous the results of individual years are presented under 5 results.
5. RESULTS:

62(49)

(i) 1603 Kg/ha. (ii) (a) 356.6 Kg/ha. (b) 403.6 Kg/ha. (iii) Main effect of D alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>D₅</th>
<th>D₆</th>
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<td>1677</td>
<td>1844</td>
<td>1891</td>
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<td>1773</td>
<td>1968</td>
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<td>1287</td>
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</table>

C.D. for D marginal means=374.3 Kg/ha.

63(61)

(i) 1329 Kg/ha. (ii) (a) 322.0 Kg/ha. (b) 382.0 Kg/ha. (iii) Main effect of D alone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
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<td>1450</td>
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<td>894</td>
<td>1329</td>
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</table>

C.D. for D marginal means=338.0 Kg/ha.

64(60)

(i) 2528 Kg/ha. (ii) (a) 1049.0 Kg/ha. (b) 506.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
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</table>
Crop :- Wheat (Rabi).  
Ref :- Rj. 60(62), 60(63).  

Site :- Govt. Agri. Res. Farm, Sriganganagar.  
Govt. Agri. Farm, Mandore.  

Type :- ‘C’.

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

1. BASAL CONDITIONS : 
(i) (a) Fallow-Wheat for 60(62); G.M.—Wheat for 60(63). (b) Fallow for 60(62); G.M. for 60(63). (c) Nil. (ii) Sandy loam. (iii) Nov., 1960. (iv) (a) 3 ploughings. (b) Drilling. (c) As per treatments. (d) 23 cm. between rows. (e) N.A. (v) 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super. (vi) R.S. 31-1; C-591. (vii) Irrigated. (viii) 2 weedings for 60(62), N.A. for 60(63). (ix) N.A. (x) April, 1961.

2. TREATMENTS : 
8 seed rates: R<sub>1</sub>=58, R<sub>2</sub>=69, R<sub>3</sub>=81, R<sub>4</sub>=92, R<sub>5</sub>=104, R<sub>6</sub>=115, R<sub>7</sub>=127 and R<sub>8</sub>=138 Kg/ha.

3. DESIGN : 
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) N.A. for 60(62); 9.1 m. x 5.5 m. for 60(63). (b) 7.0 m. x 4.9 m. for 60(62); 8.5 m. x 4.6 m. for 60(63). (v) N.A. for 60(62); 30 cm. x 46 cm. for 60(63). (vi) Yes.

4. GENERAL : 
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 only. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) Error variances are homogeneous and Treatments x years interaction is absent.

5. RESULTS : 
(i) 2547 Kg/ha. (ii) 210.7 Kg/ha. [based on 77 d.f. made up of Treatments x years interaction and pooled error]. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R&lt;sub&gt;1&lt;/sub&gt;</th>
<th>R&lt;sub&gt;2&lt;/sub&gt;</th>
<th>R&lt;sub&gt;3&lt;/sub&gt;</th>
<th>R&lt;sub&gt;4&lt;/sub&gt;</th>
<th>R&lt;sub&gt;5&lt;/sub&gt;</th>
<th>R&lt;sub&gt;6&lt;/sub&gt;</th>
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<td>2538</td>
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<td>2638</td>
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</table>

Crop :- Wheat (Rabi).  
Ref :- Rj. 60(68), 61(88), 62(47).  

Site :- Govt. Agri. Res. Farm, Sriganganagar.  

Type :- ‘C’.

Object :-To study the effect of different seed rates and different dates of sowing on the yield of Wheat.

1. BASAL CONDITIONS : 
(i) (a) Fallow-Wheat. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) As per treatments. (iv) (a) 3 ploughings. (b) N.A. (c) As per treatments. (d) 23 cm. between rows. (e) N.A. (f) R.S. 31-1. for 60(68); C-591 for others. (g) Irrigated. (h) N.A. for 60(68); 2 weedings for others. (i) N.A. (j) 20.4.1961, 24.4.1962, 9 to 22.4.1963.

2. TREATMENTS : 

Sub-plot treatments : 8 seed rates: S<sub>1</sub>=46, S<sub>2</sub>=59, S<sub>3</sub>=69, S<sub>4</sub>=81, S<sub>5</sub>=92, S<sub>6</sub>=104, S<sub>7</sub>=115 and S<sub>8</sub>=127 Kg/ha.

3. DESIGN : 
(i) Split-plot. (ii) (a) 8 main-plots/replication, 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 4.6 m. x 2.7 m. (v) N.A. (vi) Yes.

4. GENERAL : 
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960 to 62. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) The main and sub-plot error variances are heterogeneous. Therefore, the results of individual years are presented under 5. Results.
5. RESULTS:

60(68)

(i) 2418 Kg/ha. (ii) (a) 339·9 Kg/ha. (b) 303·8 Kg/ha. (iii) Main effect of D is highly significant and interaction D x S is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>S4</th>
<th>S5</th>
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C.D. for D marginal means = 284·3 Kg/ha.

C.D. for S means at the same level of D = 609·1 Kg/ha.

C.D. for D means at the same level of S = 635·4 Kg/ha.

61(88)

(i) 2679 Kg/ha. (ii) (a) 930·0 Kg/ha. (b) 416·6 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
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62(47)

(i) 2871 Kg/ha. (ii) (a) 1227·6 Kg/ha. (b) 453·8 Kg/ha. (iii) Main effect of D alone is significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for D marginal means = 1026·4 Kg/ha.
Crop: - Wheat (Rabi).
Site: - Govt. Agri. Farm, Tabiji.

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

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Fallow. (c) Nil. (ii) Nil. (iii) Oct., 1960. (iv) (a) 3 ploughings. (b) N.A. (c) As per treatments. (d) Row to row 23 cm. (e) N.A. (v) 22.4 Kg/ha. of P₂O₅. (vi) R.S. 31-1. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 1961.

2. TREATMENTS:
   8 seed rates: S₁=58, S₂=69, S₃=81, S₄=92, S₅=104, S₆=115, S₇=127 and S₈=138 Kg/ha.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) 9.1 m. x 5.5 m. (b) 8.5 m. x 4.6 m. (v) 30 cm. x 46 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 only. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
   (i) 2060 Kg/ha. (ii) 451.0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>S₆</th>
<th>S₇</th>
<th>S₈</th>
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<td>1963</td>
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<td>2075</td>
<td>2188</td>
<td>2007</td>
<td>2056</td>
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---

Crop: - Wheat (Rabi).
Site: - Govt. Agri. Farm, Tabiji.

Object: - To find out the optimum number of weedings and time of weeding for Wheat.

1. BASAL CONDITIONS:
   (i) (a) Maize-Wheat. (b) Maize. (c) 33.6 Kg/ha. of N. (ii) N.A. (iii) 19.10.61. (iv) (a) 3 ploughings. (b) and (c) N.A. (d) 22 cm. between rows. (e) N.A. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) As per treatments. (ix) N.A. (x) 20.4.62.

2. TREATMENTS:
   Same as in exp. no. 61(85) on page 91.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 7.4 m. x 5.5 m. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1961-only. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
   (i) 3599 Kg/ha. (ii) 265.4 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
<th>C₄</th>
<th>C₅</th>
<th>C₆</th>
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C.D. = 394.3 Kg/ha.
Crop: Wheat (Rabi).
Ref: Rj. 60, 61, 62(MAE).
Type: ‘CM’.

Object:—Type VIII:—To study the effect of cultural practices along with different levels of N and P on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Desert soil. (iii) As per treatments. (iv) (a) 3 ploughings and 3 harrowings. (b) In furrows. (c) As per treatments. (d) 23 cm. between rows. (e) N.A. (f) 5600 Kg/ha. of F.Y.M. (vi) C-591 (late). (vii) Irrigated. (viii) 3 weedings. (ix) N.A.; 1 to 14-4-62; 23-4-62 and 26-4-62.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 3 dates of sowing: D1=26.10.60, D2=10.11.60 and D3=25.11.60.
   (2) 3 seed rates: S1=56.0, S2=78.4 and S3=100.9 Kg/ha.
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N0=0, N1=22.4 and N2=44.8 Kg/ha.
   (2) 3 levels of P2O5 as super: P0=0, P1=22.4 and P2=44.8 Kg/ha.
   D1=21.11.61, D2=17.11.61 and Ds=2.12.61 for 1961. Dates for 1962 are N.A.

3. DESIGN:
   (i) Split-plot. (ii) 9 main-plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 11’1 m. x 4.6 m. for 61. (b) 9.8 m. x 4.1 m. for 61. (v) 61 cm. x 23 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Attack of white ants in D1 plots for 61. Nil for others. (iii) Yield of grain. (iv) (a) 1957-62 (dates under treatments are modified every year). (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   1960
   (i) 2428 Kg/ha. (ii) (a) 595.8 Kg/ha. (b) 243.5 Kg/ha. (iii) Main effects of D, N and interaction D x P are highly significant. Main effect of P is significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>N0</th>
<th>N1</th>
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C.D. for D marginal means = 264.5 Kg/ha.
C.D. for N or P marginal means = 93.6 Kg/ha.
C.D. for P means at the same level of D = 162.1 Kg/ha.
C.D. for D means at the same level of P = 295.1 Kg/ha.
1951

(i) 2118 Kg/ha.  (ii) (a) 453.2 Kg/ha.  (b) 246.1 Kg/ha.  (iii) Main effects of N and P are highly significant. Main effect of D is significant.  (iv) Av. yield of grain in Kg/ha.

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<th>D_3</th>
<th>S_1</th>
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C.D. for D marginal means=201.1 Kg/ha.  C.D. for N or P marginal means=94.6 Kg/ha.

1962

(i) 1600 Kg/ha.  (ii) (a) 358.8 Kg/ha.  (b) 235.1 Kg/ha.  (iii) Main effects of N and P are highly significant.  (iv) Av. yield of grain in Kg/ha.

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C.D. for N or P marginal means=111.7 Kg/ha.

Crop: - Wheat (Raki).
Site: - Govt. Agri. Res. Farm, Borkhera.
Object: --To find out the suitable variety for late sowing with seed rate and fertilizers requirements for Wheat.
1. BASAL CONDITIONS:
(i) (a) N.A. (b) Fallow for 61(100); Groundnut for other. (c) N.A. for 61(100); Nil for other.
(ii) Black soil. (iii) As per treatments. (iv) (a) 2 ploughings and 2 bakherings. (b) Drilling. (c) As per treatments. (d) 30 cm. between rows. (e) N.A. (f) N.A. (g) As per treatments. (h) Irrigated. (i) 1 to 2 weedings. (j) and (k) N.A.

2. TREATMENTS:
Main-plot treatments:
Two dates of sowing: D1 = 15th Dec. and D2 = 30th December.
Sub-plot treatments:
4 varieties: V1 = C-228, V2 = C-281, V3 = N.P.718 and V4 = C-286.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 3 seed rates: S1 = 92, S2 = 115 and S3 = 138 Kg/ha.
(2) 2 levels of N as A/S: M1 = 44.8 and M2 = 61.2 Kg/ha.
M applied in 2 splits, at sowing and one month after sowing.

3. DESIGN:
(i) Split-plot. (ii) 2 main-plots/replication; 4 sub-plots/main plot; 6 sub-sub-plots/sub-plot. (b) N.A.
(iii) 2. (iv) 4.3 m. x 3.7 m. (b) 3.7 m. X 3.1 m. (v) 30 cm. X 30 cm. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-1962. (b) N.A. (c) Nil. (v) and (vi) N.A.
(vii) Since the sub-sub-plot error variances are heterogeneous, the results of individual years are presented under 5. Results.

5. RESULTS:
61(100)
(i) 886 Kg/ha. (ii) (a) 35.9 Kg/ha. (b) 224.2 Kg/ha. (c) 107.6 Kg/ha. (iii) Main effects of V, N and S are highly significant and that of D is significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<th></th>
<th>V1</th>
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C.D. for D marginal means = 92.7 Kg/ha.
C.D. for V marginal means = 158.3 Kg/ha.
C.D. for S marginal means = 54.4 Kg/ha.
C.D. for N marginal means = 44.5 Kg/ha.

62(60)
(i) 1469 Kg/ha. (ii) (a) 166.8 Kg/ha. (b) 280.8 Kg/ha. (c) 314.7 Kg/ha. (iii) Main effects of D and V are highly significant. (iv) Av. yield of grain in Kg/ha.
Crop: - Wheat (Rabi).
Site: - Nadia Farm, Bharatpur.
Ref: - Rj. 65(21).
Type: - ‘CMV’.

Object: - To study the effect of different seed rates and fertility levels on the growth and yield of different Wheat varieties.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) Nil. (ii) (a) N.A. (iii) 18,12,65. (iv) (a) Disc harrowing and ploughing. (b) Behind the plough. (c) As per treatments. (d) 25 cm x 10 cm. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 21 and 22.4.66.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 varieties: \( V_1 = \text{R.S. 3-1}, V_2 = \text{C 281} \) and \( V_3 = \text{C 286} \).
   (2) 3 seed rates: \( S_1 = 90, S_2 = 100 \) and \( S_3 = 110 \) Kg/ha,
   (3) 3 levels of N: \( N_1 = 45, N_2 = 90 \) and \( N_3 = 135 \) Kg/ha.

3. DESIGN:
   (i) 3³ confd. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9.0 m x 4.0 m. (b) 8.0 m x 3.0 m. (v) 50 cm x 50 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Stand, height, no. of tillers, no. of ears, yield of grain and fodder. (iv) (a) 1965-N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2613 Kg/ha. (ii) 462.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
Crop: Wheat (Rabi).

Ref: Rj. 60(57), 61(79).

Type: 'T'.

Site: Govt. Agri. Farm, Tabiji.

Object: To study the effect of frequency and intensity of irrigation on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Fallow-Wheat for 60(57); Maize-Wheat for 61(79)(b); Fallow for 60(57); Maize for 61(79), (c) 33.6 Kg/ha. of N + 22.4 Kg/ha. of P₂O₅. (ii) N.A. (iii) Month of October. (iv) (a) to 4 ploughings. (b) and (c) N.A. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) R.S. 31-1. (vii) As per treatments. (viii) and (ix) N.A. (x) Month of April.

2. TREATMENTS:
Main-plot treatments:
All combinations of (1) and (2)
(1) 3 intensities of irrigation: \( I_1 = 1.5 \) acre inches, \( I_2 = 2.0 \) and \( I_3 = 2.5 \) acre inches.
(2) 3 methods of irrigation: \( M_1 = \) dividing the plot in 4 strips, \( M_2 = \) Plot is divided in 4 squares and \( M_3 = \) Whole plot.

Sub-plot treatments:
3 frequencies of irrigation: \( F_1 = 4 \), \( F_2 = 5 \) and \( F_3 = 6 \).

3. DESIGN:
(i) Split-plot. (ii) (a) 9 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 10.1 m. x 10.1 m. (b) 9.0 m. x 9.0 m. (v) 54 cm. x 54 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder, (iv) (a) 1960 to 61. (b) N.A. (c) Results of combined analysis given under 5. (v) and (vi) N.A. (vii) Both the error variances are homogeneous. Main-plot Treatments x years interaction is present, while sub-plot Treatments x years interaction is absent.

5. RESULTS:
(i) 2854 Kg/ha. (ii) (a) 694.8 Kg/ha. [based on 8 d.f. made up of Treatments x years interaction]. (b) 292.2 Kg/ha. [based on 46 d.f. made up of Treatments x years interaction and pooled error]. (iii) Main effect of F alone is highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for F marginal means = 138.6 Kg/ha.
Crop :- Wheat. 

Ref :- Rj. 60 to 62(MAE).

Site :- M.A.E. Centre, Sriganganagar. 

Type :- 'IM'.

Object :- Type I :-To study the effect of different intensities and frequencies of irrigations along with different levels of N and P on the yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) Desert soil. (iii) N.A.; 4, 5.11.61 ; N.A. (iv) (a) 3 ploughings and 3 harrowings.
   (b) Line sowing. (c) 80 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) 5600 Kg/ha. of F.Y.M.
   (vi) C-591(late). (vii) Irrigated. (viii) 3 weedings. (ix) N.A. ; 3 em., N.A. (x) N.A. ; 14.4.62 ; N.A.

2. TREATMENTS :
   All combinations of (1), (2), (3) and (4)
   (1) 3 frequencies of irrigations : F1=3, F2=4 and F3=5 irrigations.
   (2) 3 intensities of irrigations : I1=5·1, I2=7·6 and I3=10·2 cm.
   (3) 3 levels of N as A/S : N0=0, N1=33·6 and N2=67·2 Kg/ha.
   (4) 3 levels of P2O5 as Super : P0=0, P1=33·6 and P2=67·2 Kg/ha.

3. DESIGN :
   (i) 3a confd. (ii) (a) 9 plots/block and 9 blocks/repetition. (b) N.A. (iii) 1. (iv) (a) 11·1 m.x4·6 m. for 61; N.A. for 62. (b) 9·8 m. x 4·0 m. for 61, 9·8 m. x 4·6 m. for 62. (v) 61 cm. x 26 em. for 61, N.A.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Yield of grain and straw. (iv) (a) 1956–1962 (modified in 1958). (b) No. (c) Results of combined analysis are presented under 5. (v) N.A. (vi) Water logging in 1961. (vii) Results of 1958 and 1959 have also been considered in presenting pooled results.

5. RESULTS :
   (i) 2332 Kg/ha. (ii) 377·9 Kg/ha. (iii) Main effects of N, P and F are significant. Interaction I x F is significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for I marginal means=364·3 Kg/ha.
C.D. for N marginal means=109·8 Kg/ha.
Crop :- Wheat (Rabi).

Site :- Govt. Agri Res. Farm, Borkhera.

Object :- To evolve a manurial and irrigation schedule for Mexican wheat (sonara 64) in comparison to recommended wheat (NP 718) of the area.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) Nil. (d) Black soil. (e) 11.11.65. (iv) (a) Ploughing, bakhering, discing and planking. (b) Drilling. (c) 74 Kg./ha. (d) Between lines 31 cm. (e) Nil. (v) 22.4 Kg/ha. of K2O. (vi) As per treatments. (vii) Irrigated. (viii) 2 weedings and hoeing. (ix) N.A. (x) 26.3.66 and to 7.4.1966.

2. TREATMENTS:
   Main-plot treatments:
   2 levels of irrigation : I₁=38, I₂=5 irrigations.

   Sub-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 4 levels of N : N₁=34, N₂=68, N₃=102 and N₄=136 Kg/ha.
   (2) 2 levels of P₅O₅ : P₁=34 and P₂=68 Kg/ha.
   (3) 2 varieties : V₁=Sonara 64 and V₂=NP 718.

3. DESIGN:
   (i) Split-plot confd. (ii) (a) 2 main-plots/replication, 2 blocks/main-plot ; 8 sub-plots/block. (b) N.A.
   (iii) 2. (iv) 60 cm. x 40 m. (b) 5.7 m. x 3.7 m. (v) 17 cm. x 17 cm. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Stand height, no. of fillers and yield of grain. (iv) (a) 1965 contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2605 Kg/ha. (ii) (a) 1790-5 Kg/ha. (b) 417.8 Kg/ha. (iii) Main effects of N and V are highly significant. Interaction I x N x P is also significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for N marginal means=301.6 Kg/ha.
C.D. for V marginal means=213.2 Kg/ha.

Crop :- Wheat (Rabi).

Site :- Govt. Agri. Res. Farm, Sriganganagar.

Object :- To study the effect of irrigation, N and P on the yield of different varieties of Wheat.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 19.11.65. (iv) (a) Tractor ploughing and bullock ploughing. (b) Behind the plough. (c) C-591-75 Kg/ha. and Sonara 64-87.5 Kg/ha. (d) Rows 23 cm. apart. (e) Nil. (v) 30 Kg/ha. of K, O. (vi) and (vii) As per treatments. (viii) 4 hand hoeings. (ix) 2N.A. (x) 16.4.66.

2. TREATMENTS:
Main-plot treatments: 2 levels irrigation: I = Normal irrigation (three) and I2 = Two extra irrigations over normal (five).
Sub-plot treatments: All combinations of (1), (2) and (3).
(1) 4 levels of N: N1 = 37.5, N2 = 75, N3 = 112.5 and N4 = 150 Kg/ha.
(2) 2 levels of P2O5: P1 = 37.5 and P2 = 75 Kg/ha.
(3) 2 varieties: V1 = Sonara-64 and V2 = C-591.

3. DESIGN:
(i) Split-plot confd. 2 main-plots/replication; 2 blocks/main-plot. (ii) (a) 8 sub-plots/block. (b) N.A. (iii) 2. (iv) (a) 6.4 m. x 5.5 m. (b) 6.0 m. x 4.6 m. (v) 23 cm. x 46 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1965-contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1918 Kg/ha. (ii) (a) 234.3 Kg/ha. (b) 248.4 Kg/ha. (iii) Main effect of P is highly significant and that of N. interactions I x N and I x P are significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for N marginal means=177.5 Kg/ha.
C.D. for P marginal means=125.5 Kg/ha.
C.D. for N means at the same level of I=251.0 Kg/ha.
C.D. for I means at the same level of N=547.0 Kg/ha.
C.D. for I means at the same level of P=584.3 Kg/ha.
C.D. for P means at the same level of I=173.5 Kg/ha.

Crop: - Wheat (Rabi).
Site: - Govt. Agri. Farm, Durgapura.
Object: - To study the fertility and moisture relationship with germination, initial growth and yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) No. (b) Moong. (c) N.A. (ii) Sandy. (iii) 3.11.65. (iv) (a) Disc ploughing and harrowing, mould board ploughing. (b) Behind the plough. (c) 92.2 Kg/ha. (d) 22 cm. x 10 cm. (e) N.A. (v) 30 Kg/ha. of K, O. (vi) RS 31-1 (120 days). (vii) Irrigated. (viii) 3 weedicings. (ix) N.A. (x) 23, 24.3.66.
Ref: - Rj. 65(24).
Type: - 'ICM'.
2. TREATMENTS:

Main-plot treatments:
4 cultural-cum-irrigational treatments: $S_1 =$ Dry sowing and post irrigation with normal seed, $S_2 =$ Pre-irrigation and post sowing with normal seed, $S_3 =$ Dry sowing and post irrigation with 12 hrs soaked seed, $S_4 =$ Pre-irrigation and post sowing with 12 hrs soaked seed.

Sub-plot treatments:
4 manurial treatments: $F_1 =$ 40 Kg/ha. of N+20 Kg/ha. of P, $F_2 =$ Twice $F_1$, $F_3 =$ 40 Kg/ha. of N+40 Kg/ha. of P and $F_4 =$ Twice $F_3$.

3. DESIGN:
(i) Split-plot. (ii) 4 main-plots/replication; 4 sub-plots/main-plots. (b) N.A. (iii) 4. (iv) (a) 4.5 m. x 2.3 m. (b) 3.5 m. x 1.3 m. (v) 50 cm. x 50 cm. (vi) Yes.

4. GENERAL:
(i) Good. (iv) Nil. (iii) No. of tillers, height of plants, no. of tillers, yield of grain and fodder etc. (iv) (a) 1965 to 66. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 3311 Kg/ha. (ii) (a) 1042 Kg/ha. (b) 4389 Kg/ha. (iii) Main effect of F alone is highly significant. (iv) Av. yield of grain in Kg/ha.

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<td>3446</td>
<td>4000</td>
<td>3160</td>
<td>3594</td>
<td>3550</td>
</tr>
<tr>
<td>2800</td>
<td>4000</td>
<td>2686</td>
<td>3543</td>
<td>3257</td>
</tr>
<tr>
<td>2514</td>
<td>3886</td>
<td>3143</td>
<td>3583</td>
<td>3282</td>
</tr>
<tr>
<td>2743</td>
<td>3600</td>
<td>2857</td>
<td>3428</td>
<td>3157</td>
</tr>
<tr>
<td>Mean</td>
<td>2874</td>
<td>3872</td>
<td>2962</td>
<td>3537</td>
</tr>
</tbody>
</table>

C.D. for F marginal means = 314.8 Kg/ha.

Crop :- Wheat (Rabi).

Site :- Govt. Agri. Farm, Banswara.

Ref. :- Rj. 63(93).

Type :- 'D'.

Object :- To test the relative efficiency of seed dressing fungicides on the yield and vigour of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) Red loam. (iii) 29.11.63. (iv) (a) 4 ploughings and planking. (b) Dibbling. (c) N.A. (d) 23 cm. x 15 cm. (e) 3. (v) 85 Kg/ha. of Urea. (vi) R.S. 31-1. (vii) Irrigated. (viii) 2 hand weedings. (ix) N.A. (x) 2.4.64.

2. TREATMENTS:
10 seed dressing treatments: $T_0 =$ Control, $T_1 =$ 2 gm. of Agrosan G.N., $T_2 =$ 2 gm. of Caresan, $T_3 =$ 2 gm. of Lunasan, $T_4 =$ 3 gm. of Thirum, $T_5 =$ 2 gm. of Harvasan, $T_6 =$ 2 gm. of Tillex, $T_7 =$ 2 gm. of Shell seed drener B, $T_8 =$ 4 gm. of Trilisan, $T_9 =$ 2 gm. of Beej powder.

Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
(i) Incomple 'L' sq. (ii) (a) 3 plots/block, 10 blocks/sq. and 3 sqs. (b) N.A. (iii) 9. (iv) (a) 5.5 m. x 3.7 m. (b) 4.6 m. x 2.7 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Germination percentage and yield of grain and fodder. (iv) (a) 1963 only. (b) No. (c) Nil. (v) (a) Sriganganagar, Durgapura and Mandore. (b) N.A. (vi) N.A. (vii) Nil.
5. RESULTS:
(i) 46.33 degrees. (ii) 3.0 degrees. (iii) Treatment differences are not significant. (iv) Mean % of germination in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_0</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
<th>T_8</th>
<th>T_9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>44°8</td>
<td>45°71</td>
<td>45°31</td>
<td>45°26</td>
<td>49°08</td>
<td>46°27</td>
<td>46°80</td>
<td>44°51</td>
<td>46°77</td>
<td>49°06</td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Res. Farm, Borekhera.
Object :- To find out the effect of different chemicals for the control of rusts on Wheat.

1. BASAL CONDITIONS:
(i) (a) Fallow-G.M.-Wheat. (b) G.M. (c) N.A. (ii) Black soil. (iii) 18.11.61. (iv) (a) 6 ploughings. (b) N.A. (c) 92 Kg/ha. (d) and (e) N.A. (v) N.A. (vi) Malsie. (vii) Irrigated. (viii) and (ix) N.A. (x) 14.4.62.

2. TREATMENTS:
6 chemical treatments: T_0 = Control, T_1 = Dusting of sulphur, T_2 = Spraying with colloidal sulphur, T_3 = Spraying with ultra sulphur, T_4 = Spraying Dithane 2:8 and T_5 = Spraying Dithane M 22:(04).

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 7:3 m. x 5:5 m. (b) 5:5 m. x 3:7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) to (vii) N.A.

5. RESULTS:
(i) 1205 Kg/ha. (ii) 294°0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_0</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1278</td>
<td>1110</td>
<td>1046</td>
<td>1171</td>
<td>1307</td>
<td>1319</td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Res. Farm, Borekhera.
Object :- To find out the economic way of controlling weeds in Wheat.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) G.M. (c) N.A. (ii) Black soil. (iii) 15.11.61. (iv) (a) 6 ploughings. (b) N.A. (c) 92 Kg/ha. (d) and (e) N.A. (v) N.A. (vi) R.S. 31-I. (vii) Irrigated. (viii) and (ix) N.A. (x) 6.4.62

2. TREATMENTS:
5 weedidal treatments: T_0 = Control, T_1 = Local method of weeding, T_2 = Post emergence (once), T_3 = Post emergence (twice) and T_4 = Post emergence + weeding.
3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 7-3 m. x 5'5 m. (b) 5'5 m. x 3'7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) to (vii) N.A.

5. RESULTS:
(i) 1457 Kg/ha. (ii) 289'1 Kg/ha. (iii) Treatments differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1416</td>
<td>1463</td>
<td>1423</td>
<td>1477</td>
<td>1508</td>
</tr>
</tbody>
</table>

---

Crop :- Wheat (Rabi).

Site :- Govt. Agri. Res. Farm, Borekhera.

Ref :- Rj. 63(94).
Type :- 'D'.

Object :- To test the relative efficiency of seed dressing fungicides on the field and vigour of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Jowar. (c) N.A. (ii) Black soil. (iii) 10, 11.11.63. (iv) (a) 1 ploughing, discing and planking. (b) Drilling. (c) 35 Kg/ha. (d) 46 cm. x 46 cm. (e) Nil. (v) 98'8 Kg/ha. of N by broadcasting and 98'8 Kg/ha. of P₂O₅ by drilling. (vi) C—591. (vii) Irrigated. (viii) 1 hand weeding. (ix) 140 ern. (x) 8.4.64.

2. TREATMENTS : and 3. DESIGN:
Same as in Expt. No. 63(93) on page 107

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1963 only. (b) No. (c) N.A. (v) (a) Durgapura, Mandore, Sriganganagar. (b) Nil. (vi) A cold wave and heavy frost in the month of January. (vii) Nil.

5. RESULTS:
(i) 1448 Kg/ha. (ii) 321 0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1241</td>
<td>1237</td>
<td>1611</td>
<td>1504</td>
<td>1261</td>
<td>1651</td>
<td>1294</td>
<td>1536</td>
<td>2078</td>
</tr>
</tbody>
</table>

C.D. = 303'5 Kg/ha.

---

Crop :- Wheat (Rabi).

Site :-Govt. Agri. Farm, Durgapura.

Ref :- Rj. 60(29), 61(27).
Type :- 'D'.

Object :- To find out the economic way of controlling weeds in Wheat.

1. BASAL CONDITIONS:
(i) (a) Wheat-Cotton-Fallow-Bajra for 60(29) ; Barley-Jowar-Wheat for 61(27). (b) Bajra for 60(29); Jowar for 61(27). (c) N.A. for 60(29); Nil for 61(27). (ii) Sandy loam. (iii) 22.11.1960, 14.11.1961. (iv) (a) 3 to 4 ploughings. (b) N.A. (c) 105 Kg/ha. for 60(29); 92 Kg/ha. for others. (d) 23 cm. between rows for 60(29); 23 cm. x 15 cm. for others. (e) N.A. (v) N.A. (vi) C—591 for 60(29); R.S. 31-1 for 61(27). (vii) Irrigated. (viii) N.A. (ix) N.A.; 7 cm. for 61(27). (x) 25.4.1961; 2.4.1962.
2. TREATMENTS:

5. Methods of controlling weeds: \( W_1 \) = Control (Upored), \( W_2 \) = Local methods of weeding, \( W_3 \) = Post-emergence application of weedicides (once), \( W_4 \) = Post-emergence application of weedicides (twice) and \( W_5 \) = Post-emergence application of weedicides + weeding.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 7-3 m. x 5-5 m. (b) 5-5 m. x 3-7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 to 1951. (b) N.A. (c) Results of combined analysis given under 5. (v) and (vi) N.A. (vii) Error variances are homogeneous, Treatments x years interaction is absent.

5. RESULTS:

(i) 1729 Kg/ha. (ii) 1952 Kg/ha. (44 d.f. made up of pooled error and Treatments x years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( W_6 )</th>
<th>( W_1 )</th>
<th>( W_2 )</th>
<th>( W_3 )</th>
<th>( W_4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1676</td>
<td>1889</td>
<td>1701</td>
<td>1589</td>
<td>1792</td>
</tr>
<tr>
<td>C.D.</td>
<td>= 160.7 Kg/ha.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).

Site :- Govt. Agri. Farm, Durgapura.

Ref :- 60(22).

Type :- 'D'.

Object :- To study the effect of different levels and formulation of weedicides in the control of weeds in Wheat.

1. BASAL CONDITIONS:

(i) (a) Wheat-Cotton-Fallow-Bajra. (b) Bajra. (c) N.A. (ii) Sandy. (iii) 22.11.1960. (iv) (a) 3 ploughings. (b) N.A. (c) 115 Kg/ha. (d) and (e) N.A. (v) N.A. (vi) C=591. (vii) Irrigated. (viii) and (ix) N.A. (x) 17, 18.4.61.

2. TREATMENTS:

Main-plot treatments:

- 4 weedicides: \( W_1 \) = Sodium salt of 2, 4-D, \( W_2 \) = Ethylester of 2, 4-D, \( W_3 \) = Amine salt of 2, 4-D and \( W_4 \) = Sodium salt of M.C.P.A.

Sub-plot treatments:

- 5 levels of Weedicides: \( D_1 \) = Control, \( D_2 \) = 360 g.m. acid equivalent per hectare, \( C=841 \) g.m. acid equivalent per hectare, \( D=1'1 \) Kg. acid equivalent per hectare, \( E=1'4 \) Kg. acid equivalent per hectare.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.3 m. x 5.5 m. (b) 5.5 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (ii) Yield of grain and fodder. (iv) to (vii) N.A.

5. RESULTS:

(i) 888 Kg/ha. (ii) (a) 1776 Kg/ha. (b) 1523 Kg/ha. (iii) Main effect of \( D \) alone is significant. (iv) Av. yield of grain in Kg/ha.
Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Durgapur.
Ref :- Rj. 60(28).
Type :- 'D'.

Object :- To test the relative efficiency of seed dressing fungicides on the yield and vigour of Wheat.

1. BASAL CONDITIONS:

   (i) (a) Wheat-Cotton-Fallow-Bojra. (b) Bojra. (c) N.A. (ii) Sandy. (iii) 23.11.60. (iv) (a) 3 ploughings. (b) Dibbling. (c) 70 Kg/ha. (d) 23 cm. x 15 cm. (e) N.A. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) and (ix) N.A. (x) 23.4.61.

2. TREATMENTS:

   10 seed dressing treatments : T₀ = Control, T₁ = 3 gm. of Agrosan G.N., T₂ = 2 gm. of Ceresan, T₃ = 3 gm. of Ceresan, T₄ = 2 gm. of Lumasan, T₅ = 3 gm. of Thiram, T₆ = 2 gm. of Harvasan, T₇ = 2 gm. of Tillex, T₈ = 4 gm. of Copper Carbonate and T₉ = 4 gm. of Sulphur.

   Treatments applied to per Kg. of seed as dressing.

3. DESIGN:

   (i) R.B.D. (ii) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 4'6 m. x 2'7 m. (v) Nil. (vi) Yes.

4. GENERAL:

   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 to 62 [modified every year]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:

   (i) 1388 Kg/ha. (ii) 169'8 Kg/ha. (iii) Treatments differences are not significant. (iv) Av. yield of grain in Kg/ha.

   Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ | T₆ | T₇ | T₈ | T₉
---|---|---|---|---|---|---|---|---|---|---
Av. yield | 1228 | 1484 | 1462 | 1454 | 1288 | 1342 | 1462 | 1477 | 1334 | 1348

---

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Durgapur.
Ref :- Rj. 61(26).
Type :- 'D'.

Object :- To test the relative efficiency of seed dressing fungicides on the yield and vigour of Wheat.

1. BASAL CONDITIONS:

   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) Sandy loam. (iii) 16.11.61. (iv) (a) 4 ploughings. (b) Dibbling. (c) 70 Kg/ha. (d) 23 cm. x 15 cm. (e) N.A. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) N.A. (ix) 66 cm. (x) 1.4.62.
2. TREATMENTS:

10 seed dressing treatments: \( T_0 = \text{Control}, \ T_1 = 2 \text{ gm. of Agrosan G.N.}, \ T_2 = 2 \text{ gm. of Ceresan}, \ T_3 = 3 \text{ gm. of Ceresan}, \ T_4 = 2 \text{ gm. of Lunasan}, \ T_5 = 3 \text{ gm. of Thiram}, \ T_6 = 2 \text{ gm. of Hervasan}, \ T_7 = 2 \text{ gm. of Tritisan}, \ T_8 = 4 \text{ gm. of Shell B and} \ T_9 = 4 \text{ gm. of Biez Powder.}

Treatments applied to per Kg. of seed as dressing.

3. DESIGN:

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 4·6 m. x 2·7 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960-62 [modified every year]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:

(i) 3311 Kg/ha. (ii) 287·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>( T_4 )</th>
<th>( T_5 )</th>
<th>( T_6 )</th>
<th>( T_7 )</th>
<th>( T_8 )</th>
<th>( T_9 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2891</td>
<td>2977</td>
<td>2977</td>
<td>3064</td>
<td>3307</td>
<td>3183</td>
<td>3155</td>
<td>2990</td>
<td>2785</td>
<td></td>
</tr>
</tbody>
</table>

**Crop :-** Wheat (Rabi).  
**Site :-** Govt. Agri. Farm, Durgapura.  
**Type :-** ‘D’.  
**Ref :-** Rj. 62(70).

Object :- To test the relative efficiency of seed dressing fungicides on the yield and vigour of Wheat.

1. BASAL CONDITIONS:

(i) (a) Wheat-Fallow-Wheat. (b) Fallow. (c) Nil. (ii) Sandy. (iii) 5.11.62. (iv) (a) 2 ploughings. (b) Dibbling. (c) N.A. (d) 23 cm. x 15 cm. (e) 3. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) and (ix) N.A. (x) 2.4.63.

2. TREATMENTS:

10 seed dressing treatments: \( T_0 = \text{Control}, \ T_1 = 2 \text{ gm. of Agrosan G.N.}, \ T_2 = 2 \text{ gm. of Ceresan}, \ T_3 = 2 \text{ gm. of Lunasan}, \ T_4 = 3 \text{ gm. of Thiram}, \ T_5 = 2 \text{ gm. of Hervasan}, \ T_6 = 2 \text{ gm. of Tritisan}, \ T_7 = 4 \text{ gm. of Shell B and} \ T_8 = 4 \text{ gm. of Biez Powder.}

Treatments are applied to per Kg. of seed as dressing.

3. DESIGN:

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) and (b) 4·6 m. x 2·7 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1939 to 62 [modified every year]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:

(i) 1310 Kg/ha. (ii) 470·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>( T_4 )</th>
<th>( T_5 )</th>
<th>( T_6 )</th>
<th>( T_7 )</th>
<th>( T_8 )</th>
<th>( T_9 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1089</td>
<td>1156</td>
<td>1502</td>
<td>1374</td>
<td>1578</td>
<td>1236</td>
<td>1169</td>
<td>1541</td>
<td>1216</td>
<td>1241</td>
</tr>
</tbody>
</table>
Crop :- Wheat (Rabi).

Site :- Govt. Agri. Farm, Durgapura.

Object :- To find out the effect of different chemicals for the control of rust of Wheat.

1. BASAL CONDITIONS:
   (i) (a) Wheat-Cotton-Fallow-Bajra. (b) Bajra. (c) N.A. (ii) Sandy. (iii) 23.11.60. (iv) (a) 3 ploughings. (b) N.A. (c) 115 Kg/ha. (d) Row to row 23 cm. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) and (ix) N.A. (x) 26.4.61.

2. TREATMENTS:
   6 chemical treatments: T₀=Control, T₁=Sulphur dust, T₂=Colloidal Sulphur (1: 25), T₃=Ultra sulphur (1 Kg. in 272 litres of water), T₄=Colloidal sulphur (1: 50) and T₅=Colloidal sulphur (1 : 100).

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 7.3 m. x 5.5 m. (b) 5.5 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 and 1961 [modified in 1961]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
   (i) 893 Kg/ha. (ii) 170.5 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

   Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ | Av. yield | C.D. = 256.9 Kg/ha.
   ---------- |----|----|----|----|----|----|----------|------------------
   T₀        | 961 | 989 | 1010 | 954 | 568 | 875 |          |
   T₁        |     |     |      |     |     |     |          |
   T₂        |     |     |      |     |     |     |          |
   T₃        |     |     |      |     |     |     |          |
   T₄        |     |     |      |     |     |     |          |
   T₅        |     |     |      |     |     |     |          |
   Av. yield |     |     |      |     |     |     |          |
   C.D. = 256.9 Kg/ha.

Crop :- Wheat (Rabi).

Site :- Govt. Agri. Farm, Durgapura.

Object :- To find out the effect of different chemicals for the control of rust of Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Jowar. (c) Nil. (ii) Sandy loam. (iii) 14.11.61. (iv) (a) 4 ploughings. (b) N.A. (c) 92 Kg/ha. (d) Row to row 23 cm. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) N.A. (ix) 6.6 cm. (x) 10.4.62.

2. TREATMENTS:
   6 chemical treatments: T₀=Control, T₁=Sulphur dust, T₂=Colloidal Sulphur (1 : 25), T₃=Ultra sulphur (5 Kg. in 272 litres of water), T₄=Colloidal sulphur (1 : 50) and T₅=Colloidal sulphur (1 : 100).

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 7 m. x 5.5 m. (b) 5.5 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 and 1961 [modified in 1961]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
   (i) 3316 Kg/ha. (ii) 440.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.
Crop :- Wheat (Rabi).

Site :- Govt. Agri. Farm, Mandore.

Ref :- Rj. 60(21), 61(29).

Type :- 'D'.

Object :- To find out the economic way of controlling weeds in Wheat.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) N.A. for 60(21); Maize for other. (c) N.A. for 60(21); Compost for 61(29) but quantity N.A. (ii) Sandy loam. (iii) N.A.; 24.11.1961. (iv) (a) 4 ploughings. (b) Dibbling. (c) 70 Kg/ha. (d) and (e) N.A. (v) N.A. (vi) RS 31-1. (vii) Irrigated. (viii) 2 weedings for 60(21); N.A. for other. (ix) N.A. (x) N.A. for 60(21); 4.4.1962.

2. TREATMENTS :
   5 methods of controlling weeds : W₀ = Control (unweeded), W₁ = Local method of weeding, W₂ = Post emergence of weedicides (once), W₃ = Post emergence of weedicides (twice) and W₄ = Post emergence + weeding.

3. DESIGN :
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 7'3 m. x 5'5 m. (b) 5'5 m. x 3'7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960—1961. (b) N.A. (c) Results of combined analysis are given under 5. Results. (v) and (vi) N.A. (vii) Error variances are homogenous, interaction of Treatments x years is present.

5. RESULTS :
   (i) 1763 Kg/ha. (ii) 642 0 Kg/ha. [4 d.f. made up of interaction of Treatments with years]. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W₀</th>
<th>W₁</th>
<th>W₂</th>
<th>W₃</th>
<th>W₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1561</td>
<td>1862</td>
<td>1884</td>
<td>1970</td>
<td>1540</td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).

Site :- Govt. Agri. Farm, Mandore.

Ref :- Rj. 61(28).

Type :- 'D'.

Object :- To study the effect of different levels and formulations of weedicides in controlling weeds in Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Maize. (c) City compost. (ii) Sandy loam. (iii) 23.12.61. (iv) (a) 4 ploughings. (b) N.A. (c) 92 Kg/ha. (d) and (e) N.A. (v) N.A. (vi) RS 31-1. (vii) Irrigated. (viii) N.A. (ix) Nil. (x) 2.4.62.

2. TREATMENTS :
   10 seed dressing treatments : T₀ = Control, T₁ = Sodium salt of 2-4-D at 8 Kg/ha. of acid equivalent, T₂ = Sodium salt of 2-4-D at 1'4 Kg/ha. of acid equivalent, T₃ = Ethyl ester of 2-4-D at 8 Kg/ha. of acid equivalent, T₄ = Ethyl ester of 2-4-D at 1'4 Kg/ha. of acid equivalent, T₅ = Amine salt of 2-4-D at 8 Kg/ha. of acid equivalent, T₆ = Amine salt of 2-4-D at 1'4 Kg/ha. of acid equivalent, T₇ = Sodium salt of MCPA at 8 Kg/ha. of acid equivalent. T₈ = Amine salt of MCPA at 1'4 Kg/ha. of acid equivalent and T₉ = Local method of weeding.
DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 7.3 m. x 5.5 m. (b) 5.5 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) to (vii) N.A.

5. RESULTS:
(i) 2473 Kg/ha. (ii) 393.6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2441</td>
<td>2491</td>
<td>2478</td>
<td>2703</td>
<td>2281</td>
<td>2503</td>
<td>2540</td>
<td>2692</td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi).
Site: Govt. Agri. Farm, Mandore.
Ref: Rj. 63(85).
Type: ‘D’.

Object: To study the efficacy of different chemicals in the control of rust of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 29.11.63. (iv) (a) 3 ploughings. (b) Behind the plough. (c) 99 Kg/ha. (d) Rows, 23 cm. apart. (e) N.A. (v) 21 cu. m./ha. of compost+44.8 Kg/ha. of N as A/S. (vi) Local. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 1.4.64.

2. TREATMENTS:
7 chemical treatments: T0 = Control, T1 = Nickel chloride spray, T2 = Sulphur dusting, T3 = Colloidal sulphur spray (1 : 25), T4 = Ultra sulphur spray (1 : 25), T5 = Dithane Z-78 spray (0.5%) and T6 = Dithane M-22 spray (0.4%).

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3. (iv) (a) 2.7 m. x 1.8 m. (b) 2.1 m. x 1.2 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1963 only. (b) No. (c) N.A. (v) Sriganganagar, Durgapura and Kota. (vi) N.A. (vii) Nil.

5. RESULTS:
(i) 6t/ha. (ii) 180 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>690</td>
<td>461</td>
<td>596</td>
<td>384</td>
<td>718</td>
<td>743</td>
<td>750</td>
<td></td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi).
Site: Govt. Agri. Farm, Mandore.
Ref: Rj. 62(71).
Type: ‘D’.

Object: To test the relative efficacy of seed dressing fungicides on the yield and vigour of Wheat.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Fallow. (c) N.A. (ii) Sandy. (iii) 19.11.62. (iv) (a) 1 ploughing. (b) and (c) N.A. (d) 23 cm. x 15 cm. (e) N.A. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 23.3.63.

Ref: - Rj. 63(85).
Type: - ‘D’.
2. TREATMENTS:

10 seed dressing treatments: $T_0$=Control, $T_1$=Agrosan G.N.-3 gm., $V_1$=Ceresan-2 gm., $T_2$=Lunasan 2 gm., $T_3$=Thiram-3 gm., $T_4$=Harvasan 2 gm., $T_5$=Tillex 2 gm., $T_6$=Sheel seed dresser B-4 gm., $T_7$=Tritisan 4 gm. and $T_8$=Beej powder 3 gm.

Treatment applied to per Kg. of seed as dressing.

3. DESIGN:

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) and (b) 4·6 m. x 2·7 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1962 to 1963 [modified in 1963]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:

(i) 152 Kg/ha. (ii) 53·5 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
<th>$T_8$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>95</td>
<td>159</td>
<td>173</td>
<td>187</td>
<td>93</td>
<td>80</td>
<td>239</td>
<td>133</td>
<td>113</td>
</tr>
</tbody>
</table>

C.D. = 91·8 Kg/ha.

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

**Site :- Govt. Agri. Farm, Mandore.**

**Ref :- Rj. 63(81).**

**Type :- 'D'.**

Object :- To test the relative efficacy of seed dressing fungicides on the yield and vigour of Wheat.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 25 to 28.11,1963. (iv) (a) 2 ploughings. (b) Dibbling. (c) N.A. (d) 23 cm. x 15 cm. (e) 3. (v) 21 cu. m./ha. of T.C. and 44·8 Kg/ha. of N as A/S. (vi) RS 31-I. (vii) Irrigated. (viii) I hand weeding and thinning. (ix) N.A. (x) 31.3.64.

2. TREATMENTS:

10 seed treatments: $T_0$=Control, $T_1$=Agrosan G.N. 2 gm., $T_2$=Ceresan 2 gm., $T_3$=Lunasan 2 gm., $T_4$=Thiram 3 gm., $T_5$=Harvasan 2 gm., $T_6$=Tillex 2 gm., $T_7$=Sheel seed dresser 4 gm., $T_8$=Tritisan 4 gm. and $T_9$=Beej powder 2 gm. per Kg. of seed.

3. DESIGN:

(i) Incomplete L. Sq. (ii) (a) 3 plots/block, 10 blocks/sq., 3 sqs. (b) N.A. (iii) 9. (iv) (a) and (b) 5·5 m. x 3·7 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Few ears affected by loose smut. (iii) No. of seeds germinated/plot. (iv) (a) 1962 to 1963 [modified in 1962]. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS:

(i) 70·8 degrees. (ii) 2·6 degrees. (iii) Treatment differences are not significant. (iv) Av. no. of seeds germinated in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
<th>$T_8$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>70·6</td>
<td>70·4</td>
<td>71·6</td>
<td>71·9</td>
<td>70·4</td>
<td>70·1</td>
<td>72·1</td>
<td>68·9</td>
<td>70·1</td>
</tr>
</tbody>
</table>

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Crop: - Wheat (Rabi).

Site: - Govt. Agri. Res. Farm, Sriganganagar.

Ref: - Rj. 60(33).

Type: - 'D'.

Object: - To study the effect of different levels and formulations of weedicides in the control of weeds in Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Cotton. (c) 44·8 Kg/ha. of N. (ii) Sandy loam. (iii) 17.11.60. (iv) (a) 4 ploughings. (b) N.A. (c) 69 Kg/ha. (d) and (e) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:

   Main-plot treatments:
   4 weedicides: \( W_1 = \text{Sodium salt of 2-4-D, } W_2 = \text{Ethyles of 2-4-D, } W_3 = \text{Amines alt of 2-4-D. and } W_4 = \text{Sodium salt of M.C.P.A.} \)

   Sub-plot treatments:
   5 levels of weedicides: \( D_0 = \text{Control (No weedicide), } D_1 = 6, D_2 = 8, D_3 = 11 \text{ and } D_4 = 14 \text{ Kg. acid equivalent per ha.} \)

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/repetition, 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7·3 m. x 5·5 m. (b) 5·5 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 only. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
   (i) 2517 Kg/ha. (ii) (a) 1196·8 Kg/ha. (b) 515·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

   Control=2505 Kg/ha.

<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>
</thead>
<tbody>
<tr>
<td>( W_1 )</td>
<td>2522</td>
<td>2501</td>
<td>2839</td>
<td>2737</td>
<td>2650</td>
</tr>
<tr>
<td>( W_2 )</td>
<td>2381</td>
<td>2292</td>
<td>2476</td>
<td>2412</td>
<td>2390</td>
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<tr>
<td>( W_3 )</td>
<td>2299</td>
<td>2253</td>
<td>2331</td>
<td>2476</td>
<td>2340</td>
</tr>
<tr>
<td>( W_4 )</td>
<td>2977</td>
<td>2568</td>
<td>2635</td>
<td>2786</td>
<td>2741</td>
</tr>
<tr>
<td>Mean</td>
<td>2545</td>
<td>2403</td>
<td>2570</td>
<td>2603</td>
<td>2530</td>
</tr>
</tbody>
</table>

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Crop: - Wheat (Rabi).

Site: - Govt. Agri. Res. Farm, Sriganganagar.

Ref: - Rj. 62(69).

Type: - 'D'.

Object: - To test the relative efficacy of seed dressing fungicides on the yield and vigour of Wheat.
2. TREATMENTS:


Treatments applied to per Kg. of seed as dressing.

3. DESIGN:

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 4·6 m. x 2·7 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 to 1961 [Treatments modified in 1960]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:

(i) 2017 Kg/ha. (ii) 296·8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1899</td>
<td>2012</td>
<td>1955</td>
<td>2170</td>
<td>2245</td>
<td>1914</td>
<td>1965</td>
<td>1921</td>
<td>1944</td>
<td>2102</td>
</tr>
</tbody>
</table>

Object: To study the effect of different doses of weedicides in the control of weeds in Wheat.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Wheat. (c) 44·8 Kg/ha. (ii) Sandy loam. (iii) 14.11.61. (iv) (a) 4 ploughings. (b) N.A. (c) 76 Kg/ha. (d) 23 cm. between rows. (e) N.A. (f) N.A. (g) C—591. (h) Irrigated. (i) and (ix) N.A. (x) 23.4.62.

2. TREATMENTS:

14 weedicidal treatments T₀ = Control, T₁ = Sodium salt of 2-4-D @ 6 Kg. of acid equivalent per ha., T₂ = Sodium salt at 2-4-D @ 1·1 Kg. of acid equivalent per ha., T₃ = Sodium salt at 2-4-D @ 1·7 Kg. of acid equivalent per ha., T₄ = Ethyle easter of 2-4-D @ 6 Kg. of acid equivalent per ha., T₅ = Ethyle easter of 2-4-D @ 1·1 Kg. of acid equivalent per ha., T₆ = Ethyle easter of 2-4-D @ 1·7 Kg. of acid equivalent per ha., T₇ = Amine salt of 2-4-D @ 6 Kg. of acid equivalent per ha., T₈ = Amine Salt of 2-4-D @ 1·1 Kg. of acid equivalent per ha., T₉ = Amine Salt of 2-4-D @ 1·7 Kg. of acid equivalent per ha., T₁₀ = Sodium salt of M.C.P.A. @ 6 Kg. of acid equivalent per ha., T₁₁ = Sodium salt of M.C.P.A. @ 1·1 Kg. of acid equivalent per ha., T₁₂ = Sodium salt of M.C.P.A. @ 1·7 Kg. of acid equivalent per ha., and T₁₃ = Hand weeding.

Treatments applied to equivalent/ha.

3. DESIGN:

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 7·3 m. x 5·5 m. (b) 5·5 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1961 only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS:

(i) 2283 Kg/ha. (ii) 342·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.
4. GENERAL:
(i) N.A.; Good for 63(83). (ii) N.A. for 62(72); Mild incidence of yellow rust and incidence of brown and black rust below 5% for other. (iii) Yield of grain and fodder. (iv) (a) 1962 to 1963. (b) No. (c) Results of combined analysis are given under 5. (v) and (vi) N.A. (vii) Error variances are homogeneous, interaction Treatments x years is absent.

5. RESULTS:
(i) 2032 Kg/ha. (ii) 3119 Kg/ha. [30 d.f. made up of pooled error and interaction of Treatments with years]. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1807</td>
<td>2160</td>
<td>2078</td>
<td>1863</td>
<td>2082</td>
<td>2177</td>
<td>2058</td>
</tr>
</tbody>
</table>

Crop - Wheat (Rabi).

Site - Govt. Agri. Res. Farm, Sriganganagar.

Object: - To test the relative efficacy of seed dressing fungicides on the yield and vigour of Wheat.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Cotten. (c) 44.8 Kg/ha. of N. (ii) Sandy loam. (iii) 11.11.60. (iv) (a) 4 ploughings. (b) Dibbling. (c) 70 Kg/ha. (d) 23 cm. x 15 cm. (e) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) 2 weedicings. (ix) and (x) N.A.

2. TREATMENTS:
10 seed dressing treatments: T₀=Control, T₁=3 gm. of Agrosan G.N., T₂=2 gm. of Ceresan, T₃=3 gm. of Ceresan, T₄=2 gm. of Lunasan, T₅=2 gm. of Thiram, T₆=2 gm. of Hervasan, T₇=2 gm. of Tillex, T₈=4 gm. of Copper Carbonate and T₉=4 gm. of Sulphur.

Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 4.6 m. x 2.7 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960 and 1961 [Expt. modified in 1961]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 2388 Kg/ha. (ii) 2556 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>2344</td>
<td>2184</td>
<td>2283</td>
<td>2641</td>
<td>2414</td>
<td>2430</td>
<td>2502</td>
<td>2279</td>
<td>2445</td>
<td>2362</td>
</tr>
</tbody>
</table>

Crop - Wheat (Rabi).

Site - Govt. Agri. Res. Farm, Sriganganagar.

Object: - To test the relative efficiency of seed dressing fungicide on the yield and vigour of Wheat.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Wheat. (c) 44.8 Kg/ha. (ii) Sandy loam. (iii) 13.11.61. (iv) (a) 4 ploughings. (b) Dibbling. (c) 70 Kg/ha. (d) 30 cm. x 15 cm. (e) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) 2 weedicings. (ix) N.A. (x) 24.4.62.
Crop :- Wheat (Rabi).  
Site :- Govt. Agri. Res. Farm, Sriganganagar.  
Ref :- Rj. 60(34), 61(24).  
Type :- ‘D’.  

Object :-To find out the economic way of controlling weeds in Wheat.

1. BASAL CONDITIONS :  
   (i) (a) N.A.  (b) Cotton for 60(34); Wheat for 61(24).  (c) 44·8 Kg/ha. of N as A/S. (ii) N.A.  (iii) 18.11.60; 15.11.61.  (iv) (a) 4 ploughings.  (b) N.A.  (c) 69 Kg/ha. for 60(34); 82 Kg/ha. for 61(24).  
   (d) N.A. for 60(34); 23 cm. between rows for other.  (e) N.A.  (v) N.A.  (vi) C-591.  (vii) Irrigated.  
   (viii) and (ix) N.A.  (x) N.A. for 60(34); 24.4.1962 for 61(24).

2. TREATMENTS :  
   5 methods of weedings: Wₖ=Control (unweeded), W₁=Local method of weeding, W₂=Post emergence of weedicides (once), W₃=Post emergence of weedicides (twice) and W₄=Post emergence of weedicides & weeding.

3. DESIGN :  
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 7·3 m. x 5·5 m. (b) 5·5 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL :  
   (i) and (ii) N.A. (iii) Yield of grain and fodder.  (iv) (a) 1960 to 1961. (b) N.A. (c) Results of combined analysis are given under 5. (v) and (vi) N.A. (vii) Error variances are homogeneous, Treatments x years interaction is absent.

5. RESULTS :  
   (i) 2266 Kg/ha. (ii) 246·8 Kg/ha. [44 d.f. made up of pooled error and Treatments x years interaction].  
   (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>10</th>
<th>2386</th>
<th>2252</th>
<th>2340</th>
<th>2342</th>
<th>C.D. = 203·2 Kg/ha.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2265</td>
<td>2386</td>
<td>2252</td>
<td>2340</td>
<td>2342</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).  
Site :- Govt. Agri. Res. Farm, Sriganganagar.  
Ref :- Rj. 62(72), 63(83).  
Type :- ‘D’.  

Object :-To find out the effect of different chemicals for the control of rust of Wheat.

1. BASAL CONDITIONS :  
   (i) (a) Nil.  (b) Cotton for 62(72); Fallow for 63(83).  (c) 44·8 Kg/ha. of N for 62(72); Nil for 63(83).
   (ii) Sandy loam.  (iii) 14,11.1962; 13,11.1963. (iv) (a) 3 ploughings. (b) Dibbling for 62(72); Behind the plough for other. (c) 69 to 74 Kg/ha. (d) 23 cm. between rows. (e) N.A.  (v) N.A. for 62(72); G.M.+44·8 Kg/ha. of P₂O₅ for 63(83). (vi) C-591.  
   (vii) Irrigated.  (viii) 3 hoeings and weedings for 62(72); 2 weedings for 63(83). (ix) N.A.  
   (x) 24.4.1963; 23.4.1964.

2. TREATMENTS :  
   7 chemical treatments: T₁=Control, T₂=Nickle chloride at 5 Kg/ha. in 899 litres of water, T₃=Dusting of wheat with Sulphur, T₄=Spraying with colloidal sulphur, T₅=Spraying with ultra sulphur solution (1 : 25), T₆=Spraying with Dithane Z-73(0·5) and T₇=Spraying with Dithane N—22(0·4).

3. DESIGN :  
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 3.  
   (iv) (a) 7·3 m. x 5·5 m. for 62(72); 5·5 m. x 3·7 m. for other. (b) 7·3 m. x 5·5 m. for 62(72); 4·6 m. x 2·7 m. for other. (v) Nil for 62(72); 45 cm. x 45 cm. for other. (vi) Yes.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton. (c) 44·8 Kg/ha of N. (ii) Sandy loam. (iii) 15.11.62. (iv) (a) 3 ploughings. 
(b) Dibbling. (c) 70 Kg/ha. (d) 23 cm. x 15 cm. (e) N.A. (v) N.A. (vi) C—591. (vii) Irrigated. (viii) 
2 hoeings and weedings. (ix) N.A. (x) 22.4.65.

2. TREATMENTS:
10 chemical treatments: 
$T_0$: Control, $T_1$: 2 gm. of Agrosan G.N., $T_2$: 2 gm. of Ceresan, $T_3$: 2 gm. of 
Lunasan, $T_4$: 3 gm. of Thiram, $T_5$: 2 gm. of Harvasan, $T_6$: 2 gm. of Tillex, $T_7$: 
4 gm. of Shell B, $T_8$: 4 gm. of Tritisan and $T_9$: 3 gm. of Beej powder. 
Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) and (b) 4·6 m. x 2·7 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1962 to 1963 [Design modified in 63]. (b) No. (c) Nil. (v) 
to (vii) N.A.

5. RESULTS:
(i) 2438 Kg/ha. (ii) 347·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain 
in Kg/ha.
Treatment | $T_0$ | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$ | $T_7$ | $T_8$ | $T_9$
Av. yield  | 1834 | 2870 | 2631 | 2392 | 2233 | 2312 | 2551 | 2471 | 2658

Crop: Wheat (Rabi).
Site: Govt. Agri. Res. Farm, Sriganganagar.
Type: 'D'.
Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$
---|---|---|---|---|---|---
Av. yield | 2814 | 3754 | 3454 | 3513 | 3978 |  
C.D.=414.2 Kg/ha.

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Tabiji.

Object :-To study the effect of different doses and formulation of weedicides in controlling of weeds in Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Pea. (c) N.A. (ii) Sandy loam. (iii) 11.11.61. (iv) (a) 6 ploughings. (b) N.A. 
   (c) 99 Kgf/ha. (d) Rows 23 cm. apart. (e) Nil. (v) N.A. (vi) R.S. 31-1. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   Same as in expt. no. 61(23) conducted at Govt. Agri. Farm, Sriganganagar on page 119.

3. DESIGN:
   (i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (s) 7·3 m.×5·5 m. (b) 5·5 m.×3·7 m. (v) 91 cm.×91 cm. 
   (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1961 only. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
   (i) 4117 Kg/ha. (ii) 428.5 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain 
   in Kg/ha, 

| Treatment | $T_1$ | $T_2$ | $T_3$ | $T_4$ | $T_5$ | $T_6$
---|---|---|---|---|---|---
Av. yield | 3588 | 4025 | 4273 | 4162 | 4260 | 4485 | 3114 
| | 3899 | 4673 | 4037 | 4597 | 4273 | 3502 | 4747 

C.D.=611.9 Kg/ha.

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Udaipur.

Object :-To study the effect of different doses and formulations of weedicides in control of weeds in Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Jowar. (c) 22·4 Kg/ha. of N. (ii) Clay loam. (iii) 30.11.60. (iv) (a) 3 ploughings. 
   (b) N.A. (c) 92 Kg/ha. (d) N.A. (e) N.A. (vi) N.A. (v) N.P. 792. (vii) Irrigated. (viii) and (ix) N.A. 
   (x) 16.4.61.

2. TREATMENTS:
   Main-plot treatments:
   4 weedicides : $W_1$=Sod. Salt of 2, 4--D, $W_2$=Ethyl ester of 2, 4--D, $W_3$=Amine salt of 2, 4--D and 
   $W_4$=Sod. Salt of M.C.P.A.
   Sub-plot treatments:
   5 levels of weedicides : $D_1$=Control, $D_2$=6, $D_3$=8, $D_4$=1·1 and $D_5$=1·4 Kg. acid equivalent per 
   hectare.
3. DESIGN:
(i) Split-plot. (ii) 4 main plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7·3 m. x 5·5 m. (b) 5·5 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 to 1964 [modified every year. Not conducted in 1962 61(30), 63(114) and 64(92)]. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 3078 Kg/ha. (ii) (a) 1142·8 Kg/ha. (b) 868·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatments</th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>Mean</th>
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<td>3264</td>
<td>3023</td>
<td>3157</td>
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<td>3124</td>
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<td>3152</td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).
Site :- Govt. Agri. Farm, Udaipur.
Object :- To study the effect of different doses and formulations of weedicides in the control of weeds in Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c) 44·8 Kg/ha. of N. (j) Clay loam. (iii) 12.12.61. (iv) (a) 3 Ploughings. (b) N.A. (c) 92 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) N.P. 712. (vii) Irrigated. (viii) N.A. (iv) Nil. (x) 22.4.62.

2. TREATMENTS:
14 weedicidal treatments: T₀=Control, T₁=560 gm. of Sod. salt of acid eq./ha., T₃=1·12 Kg Sod. salt of 2, 4—D of acid eq/ha., T₄=1·7 Kg. Sod. salt of 2, 4—D of acid eq/ha., T₅=560 gm. of Ethyle easter of 2, 4—D of acid eq/ha., T₆=1·12 Kg. of Ethyle easter of 2, 4—D of acid eq/ha., T₇=560 gm. of 2, 4—D amine salt of acid eq/ha., T₈=1·1 Kg. 2, 4—D amine salt of acid eq/ha., T₉=1·7 Kg. of 2, 4—D amine salt of acid eq/ha., T₁₀=560 gm. of M.C.P.A. Sod. salt of acid eq/ha., T₁₁=1·1 Kg. of M.C.P.A. Sod. salt of acid eq/ha., T₁₂=1'7 Kg. of M.C.P.A. Sod. salt of acid eq/ha., T₁₃=560 gm. of 2, 4—D amine salt of acid eq/ha., T₁₄=1·1 Kg. of 2, 4—D amine salt of acid eq/ha., T₁₅=Hand weeding.

Where eq. stands for equivalent.

3. DESIGN:
(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 7·3 m. x 5·5 m. (b) 5·5 m. x 3'7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960—1964 [modified every year. Not conducted in 1962 60(27), 63(114), 64(99)]. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2280 Kg/ha. (ii) 525·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.
Crop :- Wheat (Rabi).
Site :- Rajasthan College of Agri., Udaipur.

Object :- To study the effect of different formulations, doses and time of application of 2-4-D on controlling of weeds in Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) and (c) N.A. (ii) Clay loam. (iii) 3.11.63. (iv) (a) Ploughings and cross ploughings. (b) Drilling. (c) and (d) N.A. (e) Nil. (v) N.A. (vi) N.P. 710. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :
   All combinations of (1), (2) and (3)+Control.
   (1) 3 formulations of 2, 4-D: F1=Sodium, F2=Amine and F3=Easter,
   (2) 4 levels of 2, 4-D: R1=0, R2=1, R3=1.5 and R4=2 Kg/ha.
   (3) 3 times of application : P1=Pre-emergence, P2=Pre + post emergence and P3=poat emergence.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) (a) 37. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8’0 m x 5’0 m. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1950-63 [modified every year. Not conducted in 1952, 60(27), 61(30), 64(99)]. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 2939 Kg/ha. (ii) 508’3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Control =2688 Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
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<tr>
<td>Av. yield</td>
<td>1977</td>
<td>2112</td>
<td>2316</td>
<td>1871</td>
<td>2062</td>
<td>2174</td>
<td>2288</td>
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<table>
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<tr>
<th>Treatment</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>2312</td>
<td>2768</td>
<td>2266</td>
<td>2132</td>
<td>1867</td>
<td>3163</td>
<td></td>
</tr>
</tbody>
</table>

Ref :- Rj. 63(114).
Type :- 'D'.

Object :- To study the effect of different herbicides with different levels of N in controlling the weeds in Wheat.

Crop :- Wheat (Rabi).
Site :- Rajasthan College of Agri., Udaipur.

Object :- To study the effect of different herbicides with different levels of N in controlling the weeds in Wheat.

Ref :- Rj. 64(99).
Type :- 'DM'.
1. **BASAL CONDITIONS**:
(i) (a) Nil. (b) and (c) N.A.  
(ii) Clay loam. (iii) 24.10.64. (iv) (a) Ploughings and cross-ploughing. (b) Drilling.  
(c) 80 Kg/ha. (d) and (e) N.A.  
(iv) N.P. 718. (v) Unirrigated. (vi) 2 weedings.  
(ix) N.A.  
(x) 20.3.65.

2. **TREATMENTS**:
All combinations of (1) and (2)

(1) 8 herbicides:  

- $H_0 =$ Control, $H_1 =$ Hand weeding, $H_2 =$ 2, 4-D Sod. salt, $H_3 =$ 2, 4-D, ester; $H_4 =$ 2, 4-D + 2, 4; $H_5 =$ Sinazine, $H_6 =$ Herbizine and $H_7 =$ TCA

(2) 2 levels of N as A/S: $N_0 =$ 0 and $N_1 =$ 22.4 Kg/ha.

3. **DESIGN**:
(i) Fact. in R.B.D.  
(ii) (a) 16. (b) N.A.  
(iii) 6. (iv) (a) N.A.  
(b) 5'0 cm. x 4'0 m. (v) N.A.  
(vi) Yes.

4. **GENERAL**:
(i) Normal. (ii) Nil. (iii) Grain and straw yield.  
(iv) (a) 1960 to 64 [modified every year, not conducted in 1962, 60(27), 61(30), 63(11)].  
(b) N.A.  
(c) Nil. (v) to (vii) Nil.

5. **RESULTS**:
(i) 2680 Kg/ha.  
(ii) 469 Kg/ha.  
(iii) All effects are highly significant.  
(iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$H_0$</th>
<th>$H_1$</th>
<th>$H_2$</th>
<th>$H_3$</th>
<th>$H_4$</th>
<th>$H_5$</th>
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<td>$N_1$</td>
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<td>3500</td>
<td>3540</td>
<td>3570</td>
<td>2260</td>
<td>500</td>
<td>3280</td>
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<td>3280</td>
<td>1980</td>
<td>520</td>
<td>2980</td>
<td>3160</td>
<td>2680</td>
</tr>
</tbody>
</table>

C.D. for $H$ marginal means = 382.0 Kg/ha.  
C.D. for N marginal means = 192.0 Kg/ha.  
C.D. for mean in $H \times N$ table = 538.9 Kg/ha.

**Crop:** Wheat *(Rabi)*.  
**Site:** Govt. Agri. Farm, Udaipur.  
**Ref:** Rj. 60(26), 61(31).  
**Type:** 'D'.

Object: To find out the economic way of controlling weeds in Wheat.

1. **BASAL CONDITIONS**:
(i) (a) N.A.  
(b) Jowar for 60(26), Maize for 61(31).  
(c) 22.4 Kg/ha. of N for 60(26), 44.8 Kg/ha. of N for 61(31).  
(iv) (a) 3 ploughings.  
(b) N.A.  
(c) 92 Kg/ha. (d) N.A. for 60(26), 23 cm. between rows for 61(31).  
(e) N.A.  
(f) N.A.  
(g) N.P. 792 for 60(26); N.P. 712 for other.  
(h) N.A.  
(i) N.A. for 60(26); Nil for 61(31).  

2. **TREATMENTS**:
5 weedings methods: $M_0 =$ Control, $M_1 =$ Local methods of weeding, $M_2 =$ Post emergence of weedicides (once), $M_3 =$ Post emergence of weedicides (twice) and $M_4 =$ Post emergence + weeding.

3. **DESIGN**:
(i) R.B.D.  
(ii) (a) 5. (b) N.A.  
(iii) 6. (iv) (a) 7'3 m x 5'5 m. (b) 5'5m x 3'7 m. (v) 91 cm. x 91 cm.  
(vi) Yes.

**GENERAL**:
(i) and (ii) N.A.  
(iii) Yield of grain and fodder.  
(iv) (a) 1960 to 1961.  
(b) N.A.  
(c) Results of combined analysis given under 5. Results.  
(v) and (vi) N.A.  
(vii) Error variances are homogeneous and Treatments x years interaction is absent.
5. RESULTS:

(i) 2499 Kg/ha. (ii) 723.7 Kg/ha. (44 d.f. made up of pooled error and Treatments × years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M</th>
<th>M</th>
<th>M</th>
<th>M</th>
<th>M</th>
</tr>
</thead>
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<td>2078</td>
<td>2717</td>
<td>2485</td>
<td>2620</td>
<td>2597</td>
</tr>
</tbody>
</table>

Crop: - Barley (Rabi).

Site: Govt. Agri. Farm, Bassi.

Ref: - Rj. 60(48), 61(50), 62(105).

Type: - 'M'.

Object: - To study the effect of different types and levels of nitrogenous fertilizers with levels of P on the yield of Barley.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (d) Sandy loam. (ii) 30.10.1960; 23.11.1961; N.A. (iii) 7 to 8 ploughings. (b) Behind the plough for 60(48); Drilling for 61(50); N.A. for 62(105). (c) 23 cm. between rows. (e) N.A. (v) 5604 Kg/ha. of F.Y.M. (vi) R.S.-17. (vii) Irrigated. (viii) 1 weeding. (x) N.A.

2. TREATMENTS:

All combinations of (1), (2) and (3) with 3 extra treatments in each block.

(i) 3 levels of N: N0 = 0, N1 = 22.4 and N2 = 44.8 Kg/ha.

(ii) 3 levels of P2O5: P0 = 0, P1 = 22.4 and P2 = 44.8 Kg/ha.

(iii) 3 sources of N: S1 = A/S, S2 = A/SIN and S3 = Urea.

Extra treatments: E1 = 44.8 Kg/ha. of N as A/S + 44.8 Kg/ha. of P2O5 as Super + 22.4 Kg/ha. of K2O as Mur. Pot., E2 = 44.8 Kg/ha. of N as Urea + 44.8 Kg/ha. of P2O5 as Super + 22.4 Kg/ha. of K2O as Mur. Pot.

3. DESIGN:

(i) 32 Fact. confd. (ii) (a) 12 plots block; 3 blocks/replication. (b) N.A. (iii) I. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Incidence of aphids for 60(48); Nil for 61(50); N.A.; for 62(105). (iii) Yield of grain. (iv) 1960 to 1962. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) The error variances are heterogeneous and Treatments × years interaction is absent. Results of individual years are presented under 5 Results.

5. RESULTS:

60(48)

(i) 2141 Kg/ha. (ii) 731.8 Kg/ha. (iii) M = 5.27; o: N अधिक है। (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
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C.D. for N marginal means = 742.2 Kg/ha.
61(50)

(i) 3091 Kg/ha. (ii) 3111 Kg/ha. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of grain in Kg/ha.

\[ E_1 = 4027, E_2 = 4055 \text{ and } E_3 = 3796 \text{ Kg/ha.} \]

<table>
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<th>( N_2 )</th>
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</table>

C.D. for N or P marginal means = 312.5 Kg/ha.

62(105)

(i) 2994 Kg/ha. (ii) 3998 Kg/ha. (iii) Main effect of N and extra vs. others are highly significant. (iv) Av. yield of grain in Kg/ha.

\[ E_1 = 3434, E_2 = 3530 \text{ and } E_3 = 3499 \text{ Kg/ha.} \]

<table>
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</table>

C.D. for N marginal means = 410.8 Kg/ha.

C.D. for extra vs. others = 153.9 Kg/ha.

Crop :- Barley (Rabi).

Site :- Govt. Agri. Farm, Bassi.

Ref :- Rj. 60(67), 61(81).

Type :- 'M'.

Object :- To find out the N, P and K requirements of Barley.

1. BASAL CONDITIONS :

(i) (a) Fallow-Barley. (b) Fallow for 60(67); Barley for 61(81). (c) Nil for 60(67); N.A. for 61(81). (ii) Sandy loam. (iii) Oct., 1960; 24.11.1961. (iv) (a) 3 to 4 ploughings. (b) Drilling. (c) 91 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) N.A. (vi) R.S.—17. (vii) Irrigated. (viii) 1 weeding. (ix) N.A (x) April, 1961; 1.4.1962.
2. TREATMENTS:

Main-plot treatments:
7 nitrogeneous treatments: No=No nitrogen, \( N_1 = 33.6 \text{ Kg/ha. of N as A/S} \), \( N_2 = 67.2 \text{ Kg/ha. of N as A/S} \), \( N_3 = 33.6 \text{ Kg/ha. of N as C/N} \), \( N_4 = 67.2 \text{ Kg/ha. of N as C/N} \), \( N_5 = 33.6 \text{ Kg as urea} \), \( N_6 = 67.2 \text{ Kg as urea} \) of N as urea.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 3 levels of \( \text{P}_0 \) as Super; \( \text{P}_0 = 0 \), \( \text{P}_1 = 33.6 \text{ Kg/ha.} \), \( \text{P}_2 = 67.2 \text{ Kg/ha.} \)
(2) 2 levels of \( \text{K}_0 \) as Mur. Pot.; \( \text{K}_0 = 0 \) and \( \text{K}_1 = 33.6 \text{ Kg/ha.} \)

N and \( \text{K}_0 \) broadcast, N applied \( \frac{1}{2} \) at sowing and \( \frac{1}{2} \) one month after sowing. P applied at sowing.

3. DESIGN:

(i) Split-plot. (ii) (a) 7 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 5'3 m. x 3'7 m. (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960-1961. (b) N.A. (c) Nil. (v) and (vi) N.A.

(vii) Since the sub-plot error variances are heterogeneous, therefore results of individual years are presented under 5 results.

5. RESULTS:

60(67)

(i) 2327 Kg/ha. (ii) (a) 1924.7 Kg/ha. (b) 561.4 Kg/ha. (iii) Main effect of \( \text{P} \) alone is highly significant. (iv) Av. yield of grain in Kg/ha.

\[
\begin{array}{cccccccc}
\text{N}_0 & \text{N}_1 & \text{N}_2 & \text{N}_3 & \text{N}_4 & \text{N}_5 & \text{N}_6 & \text{K}_0 & \text{K}_1 & \text{Mean} \\
1408 & 1511 & 2064 & 1363 & 2011 & 973 & 1651 & 1512 & 1625 & 1568 \\
1703 & 2852 & 3568 & 2617 & 3170 & 1282 & 2757 & 2436 & 2691 & 2563 \\
2262 & 3052 & 3170 & 3412 & 3774 & 1592 & 2698 & 2874 & 2828 & 2851 \\
1791 & 2472 & 2934 & 2464 & 2985 & 1282 & 2369 & 2274 & 2381 & 2327 \\
1768 & 2393 & 2869 & 2599 & 2987 & 1258 & 2044 & 1768 & 2393 & 2869 & 2599 & 2987 & 1258 & 2044 \\
1812 & 2550 & 2997 & 2328 & 2982 & 1307 & 2692 & 1812 & 2550 & 2997 & 2328 & 2982 & 1307 & 2692 \\
\end{array}
\]

C.D. for P marginal means=304.5 Kg/ha.

61(81)

(i) 2475 Kg/ha. (ii) (a) 938.7 Kg/ha. (b) 266.5 Kg/ha. (iii) Main effect of \( \text{P} \) and interactions \( \text{N} \times \text{K} \), \( \text{N} \times \text{P} \) are highly significant and interaction \( \text{P} \times \text{K} \) is significant. (iv) Av. yield of grain in Kg/ha.

\[
\begin{array}{cccccccc}
\text{N}_0 & \text{N}_1 & \text{N}_2 & \text{N}_3 & \text{N}_4 & \text{N}_5 & \text{N}_6 & \text{K}_0 & \text{K}_1 & \text{Mean} \\
1658 & 2704 & 2763 & 2605 & 3169 & 2285 & 3176 & 2560 & 2685 & 2623 \\
1871 & 2992 & 3316 & 3029 & 3671 & 2720 & 3479 & 3072 & 2950 & 3011 \\
1636 & 2549 & 2699 & 2320 & 2957 & 2118 & 3051 & 2419 & 2532 & 2475 \\
1636 & 2483 & 2574 & 2432 & 2918 & 2201 & 2687 & 2419 & 2532 & 2475 \\
1636 & 2614 & 2825 & 2209 & 2995 & 2034 & 3415 & 2419 & 2532 & 2475 \\
\end{array}
\]

C.D. for P marginal means=144.5 Kg/ha.

C.D. for P means at the same level of N =382.5 Kg/ha.

C.D. for N means at the same level of P =982.7 Kg/ha.

C.D. for means in the body of \( \text{P} \times \text{K} \) table=204.4 Kg/ha.

C.D. for K means at the same level of N =312.4 Kg/ha.

C.D. for N means at the same level of K =962.1 Kg/ha.
Object: To study the effect of different levels of N, P, and K on the yield of Barley.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 12.11.60. (iv) (a) 9 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) Row to row 23 cm. (e) N.A. (v) 5604 Kg/ha. of F.Y.M. (vi) R.S.-17. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 23.3.61.

2. **TREATMENTS**:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A/S: N₀ = 0, N₁ = 22.4 and N₂ = 44.8 Kg/ha.
   (2) 3 levels of P₂₀ as Super: P₀ = 0, P₁ = 22.4 and P₂ = 44.8 Kg/ha.
   (3) 2 levels of K₂₀ as Mur. Pot.: K₀ = 0 and K₁ = 22.4 Kg/ha.

3. **DESIGN**:
   (i) 3×2 confd. (ii) (a) 6 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9.2 m.×5.5 m. (b) 7.4 m.×3.7 m. (v) 91 cm.×91 cm. (vi) Yes.

4. **GENERAL**:
   (i) Good. (ii) Incidence of aphids, control measures N.A. (iii) Yield of grain. (iv) (a) 1960 only. (b) and (c) N.A. (v) to (vii) N.A.

5. **RESULTS**:
   (i) 3031 Kg/ha. (ii) 3400 Kg/ha. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of grain in Kg/ha.

<table>
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   C.D. for N or P marginal means=Kg/ha.

---

**Crop**: Barley (Rabi).

**Site**: Govt. Agri. Farm, Bassi.

Object: To study the effect of different types and levels of trace elements on the yield of Barley.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 13.11.60. (iv) (a) 9 ploughings. (b) Drilling. (c) 90 Kg/ha. (d) Row to row 23 cm. (e) Nil. (v) 33.6 Kg/ha. of N as A/S+33.6 Kg/ha. of P₂₀ as Super. (vi) R.S.-17. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 24.3.61.

2. **TREATMENTS**:
   All combinations of (1) and (2) with control
   (1) 5 trace elements: M₁= Ferrous sulphate, M₃=Copper sulphate M₄=Zinc Sul., M₅=Manganese sulphate and M₆=Borax powder.
   (2) 3 levels of trace elements: L₁=5.6, L₂=11.2 and L₃=16.3 Kg/ha.
3. DESIGN:
(i) Fact. in R.B.D.  (ii) (a) 16.  (b) N.A.  (iii) 3.  (iv) (a) and (b) 7·4 m. × 3·7 m.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) Good.  (ii) Incidence of aphids: control measures—N.A.  (iii) Yield of grain.  (iv) to (vii) N.A.

5. RESULTS:
(i) 2866 Kg/ha.  (ii) 491·6 Kg/ha.  (iii) None of the effects is significant.  (iv) Av. yield of grain in Kg/ha.

Control=2452 Kg/ha.

<table>
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Crop :- Barley (Rabi).
Site :- Govt. Agri. Res. Farm, Sultanpur.
Ref :- Rj. 64(70).
Type :- ’M’.

Object :- To study the effect of different levels of N, P and K on the yield of Barley.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) Black cotton soil.  (iii) 7.11.64.  (iv) (a) 3 bakherings.  (b) Drilling.
(c) N.A.  (d) 30 cm. between lines  (e) N.A.  (v) Nil.  (vi) R.S. 17.  (vii) Irrigated.  (viii) Nil.
(ix) Negligible.  (x) 30.3.65.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 4 levels of N as A/S: N₀=0, N₁=33·6, N₂=67·2 and N₃=100·9 Kg/ha.
(2) 3 levels of P₀ as Super: P₀=0, P₁=33·6 and P₂=67·2 Kg/ha.
(3) 3 levels of K₀ as Pot. Sul.: K₀=0, K₁=33·6 and K₂=67·2 Kg/ha.

3. DESIGN:
(i) 4x3 confd. Fact.  (ii) (a) 12 plots/block and 3 blocks/replication.  (b) N.A.  (iii) 2.  (iv) (a) 7·0 m. × 4·3 m.  (b) 6·4 m. × 3·7 m.  (v) 30 cm. × 30 cm.  (vi) Yes.

4. GENERAL:
(i) Normal.  (ii) Nil.  (iii) Yield of grain.  (iv) (a) 1963-contd.  (b) No.  (c) N.A.  (iv) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 2488 Kg/ha.  (ii) 458·5 Kg/ha.  (iii) Main effects of N and P are highly significant.  (iv) Av. yield of grain in Kg/ha.
Crop: Barley (Rabi).  
Site: Govt. Agri. Farm, Hemawas.  
Object: To study the effect of different levels of N and P on the yield of different varieties of Barley.

### 1. BASAL CONDITIONS:
- (i) to (c) N.A.
- (ii) Heavy soil for 62(50), 63(60); Laterite for 64(67).
- (iii) 27.11.1962; 30.11.1963; 28.11.1964.
- (iv) (a) 3 ploughings with tractor. (b) Behind the plough. (c) 10% Kg/ha., 92 Kg/ha., 79 Kg/ha.
- (d) 23 cm. between rows.
- (e) N.A.
- (f) Nil.
- (g) As per treatments.
- (h) Irrigated.
- (i) 2 weedings.
- (j) N.A.
- (k) 27.3.1964; 3.4.1965.

### 2. TREATMENTS:
- All combinations of (1), (2) and (3)
  - (1) 3 levels of N: N₀ = 0, N₁ = 33·6 and N₂ = 67·2 Kg/ha.
  - (2) 3 levels of P₂O₅: P₀ = 0, P₁ = 33·6 and P₂ = 67·2 Kg/ha.
  - (3) 2 varieties: V₁ = Local and V₂ = R.S.-17.

### 3. DESIGN:
- (i) 3² x 2 confd.
- (ii) (a) 6 plots/block; 3 blocks/replication.
- (b) N.A.
- (iii) 2.
- (iv) (a) 5·5 m. x 3·7 m. (b) 4·9 m. x 3·1 m.
- (v) 30 cm. x 30 cm.
- (vi) Yes.

### 4. GENERAL:
- (i) N.A. for 62(50); Good for 63(60); Poor for 64(67).
- (ii) N.A. for 62(50); Incidence of aphids which was controlled by spraying 5% B.H.C. powder for others.
- (iii) Yield of grain.
- (iv) (a) 1962 to 1964.
- (b) No.
- (c) Nil.
- (d) Mandore.
- (e) N.A.
- (f) Since the error variances are heterogeneous and the Treatments x years interaction is absent, therefore results of individual years are presented under 5. Results.

### 5. RESULTS:

#### 62(50)
- (i) 1274 Kg/ha.
- (ii) 356·6 Kg/ha.
- (iii) Main effect of N alone is highly significant.
- (iv) Av. yield of grain in Kg/ha.
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<th>$V_3$</th>
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C.D. for $N$ marginal means = 314.3 Kg/ha.

63(60)

(i) 2015 Kg/ha.  (ii) 367.4 Kg/ha.  (iii) Main effects of $N$ and $P$ are highly significant and interaction $N \times P$ is significant.  (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>$P_1$</th>
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<td>2154</td>
<td>2251</td>
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</tbody>
</table>

C.D. for $N$ or $P$ marginal means = 316.5 Kg/ha.
C.D. for means in the body of $N \times P$ table = 548.1 Kg/ha.

64(67)

(i) 1156 Kg/ha.  (ii) 1124 Kg/ha.  (iii) None of the effects is significant.  (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$V_1$</th>
<th>$V_2$</th>
<th>$V_3$</th>
<th>$P_1$</th>
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<td>1046</td>
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Crop :- Barley (Rabi).
Site :- Govt. Agri. Farm, Mandore.
Object :- To study the effect of different levels of $N$ and $P$ on the yield of different varieties of Barley.

Ref :- RJ. 62(80), 64(62).
Type :- 'MV'.
1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 18.11.1962; 7.11.1964. (iv) (a) 2 cross discings followed by patta for 62(80); 3 summer ploughings and 2 ploughings at the time of sowing for 64(62); (b) Sowing in lines by drilling for 62(80); Behind the plough for 64(62); (c) 101 Kg/ha.; 79 Kg/ha. (d) 23 cm. between lines. (e) N.A. (f) Nil. (g) As per treatments. (h) Irrigated. (i) 1 kharpi weeding for 62(80); N.A. for the other. (ii) N.A. (x) 20.3.1963; 19.3.1965.

2. TREATMENTS and 3. DESIGN:
Same as in Expts no. 62(50), 63(60), 64(67) conducted at Hemawas on page 133. N as A/S broadcast at sowing and at first irrigation and P₂O₅ as Super drilled at sowing.

4. GENERAL:
(i) Normal for 62(80); Good for 64(62) but lodging during February. (ii) N.A. for 62(80); Heavy incidence of aphids, spraying of Nicotine sulphate for 64(62). (iii) Yield of grain. (iv) (a) 1962—1964(1963 N.A.). (v) N.A. (vi) N.A. for 62(80); Rains with speedy winds during February for 64(62). (vii) Error variances are heterogeneous Treatments ×years interaction is absent.

5. RESULTS:
(i) 2605 Kg/ha. (ii) 400.7 Kg/ha. (based 39 d.f. made up of pooled error and Treatments ×years interaction). (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
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<th>N₁</th>
<th>N₂</th>
<th>P₀</th>
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</table>

C.D. for N marginal means = 233.5 Kg/ha.

Ref:- Rj. 60(61). Type :- 'C'.

Crop :- Barley (Rabi).
Site :- Govt. Agri. Farm, Bassi.
Object:- To find out the optimum seed rate and date of sowing for Barley.

BASAL CONDITIONS:
(i) (a) Millets—Barley. (b) Millets. (c) Nil. (ii) Sandy loam. (iii) As per treatments. (iv) (a) 3 ploughings. (b) Drilling. (c) As per treatments. (d) 23 cm. between rows. (e) N.A. (f) N.A. (g) R.S.—17. (h) Irrigated. (i) 1 weeding. (ii) N.A. (x) April, 1960.

2. TREATMENTS:
Main-plot treatments:
8 dates of sowing: D₁=12.10.59; D₅=22.10.59; D₆=11.11.59; D₇=21.11.59; D₈=11.12.59; D₉=12.12.59. Sub-plot treatments:
8 seed rates: R₁=46, R₂=58, R₃=69, R₄=81, R₅=92, R₆=104, R₇=115 and R₈=127 Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 8 main-plots/block; 8 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 7·3 m. × 5·5 m. (b) 6·4 m. × 4·6 m. (v) 46 cm. × 46 cm. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) to (vii) N.A.

5. RESULTS:
(i) 2501 Kg/ha. (ii) (a) 635.5 Kg/ha. (b) 514.1 Kg/ha. (iii) Main effect of D alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>R6</th>
<th>R7</th>
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C.D. for D marginal means = 531.4 Kg/ha.

Crop :- Barley (Rabi)
Site :- Govt. Agri. Farm, Bassi and Durgapura.
Object :- To find out the optimum seed rate for Barley.

1. BASAL CONDITIONS:
(i) (a) Millets-Barley for 60 (60); Fallow-Barley for 60 (58). (b) Millets for 60 (60); Fallow for 60 (58).
(c) Nil. (ii) Sandy loam. (iii) 17.11.1960; 4.11.1960. (iv) (a) 3 ploughings. (b) Drilling. (c) As per treatments. (d) 23 cm. between rows. (e) N.A. (v) 22.4 Kg/ha. of P4O10. (vi) R.S.—17. (vii) Irrigated. (viii) 1 weeding. (ix) and (x) 26.3.1961 for 60 (60); April, 1961 for 60 (58).

2. TREATMENTS:
8 seed rates: R1 = 58, R2 = 69, R3 = 81, R4 = 92, R5 = 104, R6 = 115, R7 = 127 and R8 = 138 Kg/ha.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4 for 60 (60); 6 for 60 (58). (iv) (a) 9.1 m. X 5.5 m. (b) 8.5 m. X 4.6 m. (v) 30 cm. X 46 cm. (vi) Yes,

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Yield of grain. (iv) (a) 1960 only. (b) —. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous and (Treatments X years) interaction is absent. Results of individual years are presented under 5. Results.

5. RESULTS:

60(60)
(i) 3048 Kg/ha. (ii) 244.1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>R6</th>
<th>R7</th>
<th>R8</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
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<td>3102</td>
<td>2942</td>
<td>3000</td>
<td>3255</td>
<td>2957</td>
<td>2877</td>
<td>2994</td>
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</tbody>
</table>

60(58)
(i) 2381 Kg/ha. (ii) 478.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.
Crop :- Barley (Rabi).
Site :- Govt. Agri. Res. Farm, Sriganganagar.
Object :- To find out suitable variety and optimum date of sowing for Barley.

1. BASAL CONDITIONS :
   (i) (a) Fallow- Barley. (b) Wheat. (c) N.A. (ii) Sandy loam. (iii) As per treatments. (iv) 3 ploughings.
   (b) and (c) N.A. (d) Row to row 23 cm. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated
   (viii) 1 weeding. (ix) N.A. (x) 1.5.1962.

2. TREATMENTS :
   Main-plot treatments :
   3 dates of sowing : D1 = 27.10.61, D2 = 16.11.61 and D3 = 11.12.61.
   Sub-plot treatments :
   6 varieties : V1 = Local, V2 = R.S.-17, V3 = R-16, V4 = R-11, V5 = R-14 and V6 = R-2.

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) 7·0 m. x
   4·6 m. (b) 6·5 x 4·0 m. (v) 27 cm. x 27 cm. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1961 to 1962 (Treatments modified in 1962). (b) and (c) N.A.
   (v) to (vii) N.A.

5. RESULTS :
   (i) 2100 Kg/ha. (ii) (a) 627'7 Kg/ha. (b) 416'2 Kg/ha. (iii) Main effect of D alone is highly significant.
   (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>V4</th>
<th>V5</th>
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<td>1920</td>
<td>1916</td>
<td>2337</td>
<td>2112</td>
<td>2100</td>
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</tbody>
</table>

C.D. for D marginal means = 443'3 Kg/ha.

Crop :- Barley (Rabi).
Site :- Govt. Agri. Res. Farm, Sriganganagar.
Object :- To find out the variety and optimum time of sowing for Barley.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) As per treatments. (iv) (a) 4 ploughings. (b)
   and (c) N.A. (d) Row to row 23 cm. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigated. (viii) 2
   weeding. (ix) N.A. (x) 26.3.63 and 1.4.63.
2. TREATMENTS:

Main-plot treatment:
3 dates of sowing: $D_1 = 13.10.62$, $D_2 = 13.11.62$ and $D_3 = 26.11.62$.

Sub-plot treatments:
6 varieties: $V_1 =$ Local, $V_2 = R.S.-17$, $V_3 = R-16$, $V_4 = R-11$, $V_5 = R-14$ and $V_6 = R-2$.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block; 6 sub-plots/main-plots (b) N.A. (iii) 4. (iv) 6·0 m. x 4·6 m. (b) 5·2 m. x 3·7 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1961-62 (Treatments modified in 1963). (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:

(i) 2025 Kg/ha. (ii) (a) 812·6 Kg/ha. (b) 511·8 Kg/ha. (iii) Main effect of V alone is significant. (iv) Av. yield of grain in Kg/ha.

<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>
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C.D. for V marginal means=42·1 Kg/ha.

Crop :- Barley (Rabi).

Site :- Govt. Agri. Farm, Bassi.

Ref :- Rj. 65(8).

Type :- 'IM'.

Object :- To study the effect of different frequencies and depths of irrigation on the yield of Barley with varying levels of N.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Maize. (c) 44·8 Kg/ha. of $P_2O_5+67·2 Kg/ha$. of N. (ii) Sandy loam. (iii) 21.10.65. (iv) (a) Ploughing and disc harrowing by tractor and desi plough. (b) Behind the plough. (c) 65 Kg/ha. (d) 2 cm. between rows. (e) N.A. (v) 17 Kg/ha. of K$_2$O. (vi) R.S. 17. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 25.3.66.

2. TREATMENTS:

Main-plot treatments:
3 levels of irrigation: $F_1 = 3$, $F_2 = 4$ and $F_3 = 5$ irrigations.

Sub-plot treatments:
All combinations of (i) and (2)
(1) 2 manuers, $M_1 = 45$ Kg/ha. of $N+34$ Kg/ha. of $P_2O_5$.
(2) 3 levels of irrigation: $I_1 = 3$, $I_2 = 6$ and $I_3 = 9$ cm. depth of irrigation.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication, 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 4 m. x 9 m. (b) 3 m. x 8 m. (v) 50 cm. x 50 cm. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) Height, tiller, length and yield of grain. (iv) (a) 1965—N.A. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 2514 Kg/ha. (ii) (a) 1547.9 Kg/ha. (b) 530.0 Kg/ha. (iii) None of the effect is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>I1</th>
<th>I2</th>
<th>I3</th>
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Crop :- Barley (Rabi).  
Site :- Govt. Agri. Farm, Bassi.  
Ref :- Rj. 63(91), 63(115).  
Type :- 'D'.

Object :- To test the relative efficacy of seed dressing fungicides on the yield and vigour of Barley.

1. BASAL CONDITIONS:
(i) (a) Fallow-Barley. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 2.11.1963. (iv) (a) 7 ploughings for 63(91); N.A. for 63(115). (b) Dibbling. (c) 1386 seeds/plot for 63(91); N.A. for 63(115). (d) 23 cm. x 15 cm. for 63(91); N.A. for 63(115). (e) 3 for 63(91); N.A. for 63(115). (f) 33.6 Kg/ha. of N as A/S broadcast + 22.4 Kg/ha. of P2O5 drilled for 63(91); N.A. for 63(115). (g) R.S.- 17. (h) Irrigated. (i) 1 to 2 weedings. (ix) N.A. (x) 1.4.1964.

2. TREATMENTS:
10 fungicial treatments : F0 = Control, F1 = Agrosan at 2 gm., F2 = Ceresan at 2 gm.; F3 = Lunasan at 2 gm., F4 = Thiram at 3 gm., F5 = Harvasan at 2 gm., F6 = Tillex at 2 gm., F7 = Shell seed dresser at 2 gm., F8 = Tritisan at 4 gm. and F9 = Beej powder at 2 gm. Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3 for 63(91); 3 for 63(115). (iv) (a) 5.0 m. x 3.2 m. (b) 4.6 m. x 2.7 m. (c) 23 cm. x 23 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Incidence of plant leaf stripe disease for 63(91); Nil for 63(115). (iii) Yield of grain and germination analysis for 63(91); yield of grain for 63(115). (iv) (a) 1963 only. (b) No. (c) Results of combined analysis are given under 5. (v) Mandore. (vi) N.A. (vii) Error variances are homogeneous Treatments x years interaction is absent.

5. RESULTS:
(i) 2993 Kg/ha. (ii) 403.2 Kg/ha. (based on 72 d.f. made up of Treatments x years interaction and pooled error). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
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<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
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<th>F7</th>
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<td>2590</td>
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<td>3014</td>
<td>2653</td>
<td>2891</td>
</tr>
<tr>
<td>C.D.</td>
<td>379.3 Kg/ha.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

Germination 63(91)
(i) 49.7 degrees. (ii) 4.1 degrees. (iii) Treatment differences are significant. (iv) Av. germination in degrees.
Crop: Barley (Rabi).
Site: Govt. Agri. Farm, Bassi.

Object: To study the effect of different doses and formulations of weedicides in controlling of weeds in Barley.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Fallow. (c) N.A. (ii) Sandy loam. (iii) 17.11.60. (iv) (a) 8 ploughings. (b) Dibbling to (e) N.A. (v) N.A. (vi) R.S. 17. (vii) Irrigated. (viii) and (ix) N.A. (x) 28.3.61.

2. TREATMENTS:
   Main-plot treatments:
   4 types of weedicides: W₁=Sodium salt of 2, 4-D, W₂=Ethylester of 2, 4-D, W₃=Amine salt of 2, 4-D and W₄=Sodium salt of M.C.P.A.
   Sub-plot treatments:
   5 levels of weedicides: D₀=0, D₁=0.6 Kg/ha., D₂=0.8 Kg/ha., D₃=1.1 Kg/ha. and D₄=1.4 Kg/ha. of acid equivalent.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/block; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.3 m. x 5.5 m. (b) 5.5 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1958-1960. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
   (i) 2228 Kg/ha. (ii) 610.0 Kg/ha. (b) 500.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>D₀</th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
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<td>W₁</td>
<td>—</td>
<td>2402</td>
<td>3405</td>
<td>2854</td>
<td>3031</td>
<td>2909</td>
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<tr>
<td>W₂</td>
<td>—</td>
<td>2557</td>
<td>2980</td>
<td>2409</td>
<td>2494</td>
<td>2700</td>
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<tr>
<td>W₃</td>
<td>—</td>
<td>3193</td>
<td>2535</td>
<td>2995</td>
<td>2931</td>
<td>2797</td>
</tr>
<tr>
<td>W₄</td>
<td>—</td>
<td>3037</td>
<td>2960</td>
<td>2642</td>
<td>2698</td>
<td>2906</td>
</tr>
<tr>
<td>Mean</td>
<td>2859</td>
<td>2797</td>
<td>2970</td>
<td>2725</td>
<td>2788</td>
<td>2828</td>
</tr>
</tbody>
</table>

Crop: Barley (Rabi).
Site: Govt. Agri. Farm, Bassi.

Ref: Rj. 60(24).
Type: 'D'.

Object: To find out the economic way of controlling weeds in Barley.
1. **BASAL CONDITIONS**:
   (i) (a) N.A. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 17.11.60. (iv) (a) 8 ploughings. (b) Dibbling. (c) to (e) N.A. (vi) R.S. 17. (vii) Irrigated. (viii) and (ix) N.A. (x) 27.3.61.

2. **TREATMENTS**:
   5 methods of controlling weeds: \( \bar{W}_0 = \text{Control (No weeding)} \), \( \bar{W}_1 = \text{Local method of weeding} \), \( \bar{W}_2 = \text{Post emergence application weedicides (once)} \), \( \bar{W}_3 = \text{Post emergence application of weedicides (twice)} \) and \( \bar{W}_4 = \text{Post emergence application of weedicides + weeding} \).

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 7·3 m. × 5·5 m. (b) 5·5 m. × 3·7 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. **GENERAL**:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958 to 1960. (b) and (c) N.A. (v) to (vii) N.A.

5. **RESULTS**:
   (i) 3324 Kg/ha. (ii) 307·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( \bar{W}_0 )</th>
<th>( \bar{W}_1 )</th>
<th>( \bar{W}_2 )</th>
<th>( \bar{W}_3 )</th>
<th>( \bar{W}_4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>3268</td>
<td>3363</td>
<td>3466</td>
<td>3151</td>
<td>3372</td>
</tr>
</tbody>
</table>

**Crop :-** Barley (Rabi).  
**Site :-** Govt. Agri. Farm, Bassi.

Ref :- Rj. 60(30).  
Type :- 'D'.

Object :- To test the relative efficacy of seed dressing fungicides on the yield and vigour of Barley.

1. **BASAL CONDITIONS**:
   (i) (a) N.A. (b) Maize. (c) 28·0 Kg/ha. of \( P_2O_5 \) + 33·6 Kg/ha. of \( N \). (ii) (a) Sandy loam. (iii) 13.11.60. (iv) (a) 8 ploughings. (b) Dibbling. (c) N.A. (d) 23 cm. × 15 cm. (e) N.A. (vi) N.A. (viii) and (ix) N.A. (x) 2.4.61.

2. **TREATMENTS**:
   10 fungidal treatments: \( \bar{F}_0 = \text{Control} \), \( \bar{F}_1 = \text{Agrosan G.N. at 3 gm.} \), \( \bar{F}_2 = \text{Ceresan at 2 gm.} \), \( \bar{F}_3 = \text{Ceresan at 3 gm.} \), \( \bar{F}_4 = \text{Lunasan at 2 gm.} \), \( \bar{F}_5 = \text{Thiram at 2 gm.} \), \( \bar{F}_6 = \text{Hervasan at 2 gm.} \), \( \bar{F}_7 = \text{Tillex at 2 gm.} \), \( \bar{F}_8 = \text{Copper carbonate at 4 gm.} \) and \( \bar{F}_9 = \text{Sulphur at 4 gm.} \).

Treatments applied to per Kg. of seed as dressing.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 4·6 m. × 2·7 m. (b) N.A. (v) N.A. (vi) Yes.

4. **GENERAL**:
   (i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1960—63 (Treatments modified every year). (b) N.A. (c) Nil. (v) to (vii) N.A.

5. **RESULTS**:
   (i) 4857 Kg/ha. (ii) 422·2 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( \bar{F}_0 )</th>
<th>( \bar{F}_1 )</th>
<th>( \bar{F}_2 )</th>
<th>( \bar{F}_3 )</th>
<th>( \bar{F}_4 )</th>
<th>( \bar{F}_5 )</th>
<th>( \bar{F}_6 )</th>
<th>( \bar{F}_7 )</th>
<th>( \bar{F}_8 )</th>
<th>( \bar{F}_9 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>4875</td>
<td>4626</td>
<td>4611</td>
<td>4777</td>
<td>4761</td>
<td>5123</td>
<td>4860</td>
<td>5003</td>
<td>5948</td>
<td>4882</td>
</tr>
</tbody>
</table>
Crop :- Barley (Rabi).

Site :- Govt. Agri. Farm, Bassi.

Object :- To test the relative efficacy of seed dressing fungicides on the yield and vigour of Barley.

1. BASAL CONDITIONS :
   (i) (a) Fallow—Wheat. (b) Wheat. (c) 22.4 Kg/ha. of N+28.0 Kg/ha. of P_2O_5. (ii) Sandy loam. (iii) 1.12.61. (iv) (a) 8 ploughings. (b) Dibbling. (c) N.A. (d) 23 cm. x 15 cm. (e) N.A. (v) N.A. (vi) R.S.—17. (vii) Irrigated. (viii) N.A. (ix) 2 cm. (x) 5.4.62.

2. TREATMENTS :
   10 fungidal treatments : F_1=Control, F_2=Agrosan G.N. at 3 gm., F_3=Ceresan at 2 gm., F_4=Thiram at 3 gm., F_5=Lunasan at 3 gm., F_6=Hervasan at 2 gm., F_7=Tillex at 2 gm., F_8=Shell B at 4 gm. and F_9=Tritisan at 4 gm.
   Treatments applied to per Kg. of seed at dressing.

3. DESIGN :
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 4.6 m. x 2.7 m. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) N.A. (iii) Yield of grain. (iv) (a) 1960—63 (treatments modified every year). (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS :
   (i) 4636 Kg/ha. (ii) 5661 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F_1</th>
<th>F_2</th>
<th>F_3</th>
<th>F_4</th>
<th>F_5</th>
<th>F_6</th>
<th>F_7</th>
<th>F_8</th>
<th>F_9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>4265</td>
<td>4480</td>
<td>4697</td>
<td>4690</td>
<td>4671</td>
<td>4712</td>
<td>4611</td>
<td>4677</td>
<td>4882</td>
</tr>
</tbody>
</table>

Crop :- Barley (Rabi).

Site :- Govt. Agri. Farm, Bassi.

Object :- To test the relative efficacy of seed dressing fungicides on the yield and vigour of Barley.

1. BASAL CONDITIONS :
   (i) (a) Barley—Fallow—Barley. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 5.11.62. (iv) (a) 8 ploughings. (b) Dibbling. (c) N.A. (d) 23 cm. x 15 cm. (e) N.A. (v) N.A. (vi) R.S.—17. (vii) Irrigated. (viii) 1 weeding. (ix) 1 cm. (x) 20.3.63.

2. TREATMENTS :
   10 fungidal treatments : F_5=Control, F_1=Agrosan G.N. at 3 gm., F_2=Ceresan at 2 gm., F_3=Lunasan at 2 gm., F_4=Thiram at 3 gm., F_5=Lunasan at 2 gm., F_6=Hervasan at 2 gm., F_7=Tillex at 2 gm., F_8=Shell B seed dresser at 4 gm., F_9=Tritisan at 4 gm., and F_10=Blaji powder at 3 gm.
   Treatments applied to per Kg. of seed as dressing.

3. DESIGN :
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) and (b) 4.6 m. x 2.7 m. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1960—63 (Treatments modified every year). (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 4057 Kg/ha. (ii) 337.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>F₃</th>
<th>F₄</th>
<th>F₅</th>
<th>F₆</th>
<th>F₇</th>
<th>F₈</th>
<th>F₉</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>351</td>
<td>4085</td>
<td>4144</td>
<td>4051</td>
<td>4572</td>
<td>3851</td>
<td>3902</td>
<td>4301</td>
<td>4072</td>
<td>4040</td>
</tr>
</tbody>
</table>

**Crop :- Barley (Rabi).**
**Site :- Govt. Agri. Farm, Mandore.**

Object:—To test the relative efficacy of seed dressing fungicides on the yield, vigour and incidence of covered smut of Barley.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Bajra. (c) N.A. (ii) Sandy loam. (iii) 3 to 5.12.63. (iv) (a) Ploughing. (b) Dibbling. (c) N.A. (d) 23 cm. × 15 cm. (e) 3. (v) Town compost + 22 Kg/ha. of N as A/S. (vi) R.S.—17. (vii) Irrigated. (viii) 1 weeding and thinning. (ix) N.A. (x) 4.4.64.

2. TREATMENTS:
Same as in expt. no. 62(111) on page 142. Doses of shell seed dresser and Beej powder are 2 gm/Kg.

3. DESIGN:
(i) Incomplete L. Sq. (ii) 3 plots/block, 10 blocks/Sq., 3 Sqs. (b) N.A. (iii) 9. (iv) (a) and (b) 5·5 m. × 3·7 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) Infection of covered smuts. (iii) No. of plants germinated. (iv) (a) 1962—contd. (b) No. (c) Nil. (v) Bassi and Durgapura. (vi) N.A. (vii) Nil.

5. RESULTS:
(i) 74.3 degrees. (ii) 4.0 degrees. (iii) Treatment differences are not significant. (iv) Av. no. of plants germinated.

**Crop :- Jowar (Kharif).**
**Site :- Govt. Agri. Res. Farm, Borkhera.**

Object:—To study the effect of N, P and K applied at different levels on the yield of Jowar.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) 24.7.61. (iv) (a) 7 ploughings. (b) N.A. (c) 11 Kg/ha. (d) 30 cm. × 23 cm. (e) N.A. (v) N.A. (vi) R.S.—1. (vii) Unirrigated. (viii) and (ix) Nil. (x) 12, 13.12.1961.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S : $N₀=0$, $N₁=33.6$ and $N₂=67.2$ Kg/ha.
(2) 3 levels of $P₂O₅$ as Super : $P₀=0$, $P₁=33.6$ and $P₂=67.2$ Kg/ha.
(3) 2 levels of $K₂O$ as Mur. Pot. : $K₀=0$ and $K₁=33.6$ Kg/ha.
3. DESIGN:
(i) 3\( \times \)2 confd. (ii) (a) 6 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9·2 m.\( \times \)5·5 m. (b) 7·4 m.\( \times \)3·7 m. (v) 91 cm.\( \times \)91 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 only. (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 787 Kg/ha. (ii) 436·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>K₁</th>
<th>K₂</th>
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<td>728</td>
<td>651</td>
<td>651</td>
<td>567</td>
<td>609</td>
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<tr>
<td>N₁</td>
<td>682</td>
<td>917</td>
<td>913</td>
<td>834</td>
<td>841</td>
<td>837</td>
</tr>
<tr>
<td>N₂</td>
<td>802</td>
<td>845</td>
<td>1101</td>
<td>939</td>
<td>892</td>
<td>916</td>
</tr>
<tr>
<td>Mean</td>
<td>644</td>
<td>830</td>
<td>888</td>
<td>808</td>
<td>767</td>
<td>787</td>
</tr>
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</table>

Crop :- Jowar (Kharif).
Site :- Govt. Agri. Res. Farm, Borkhera.
Object :- To study the effect of different types of trace elements at different levels on the yield of Jowar.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) 20.7.60. (iv) (a) 1 ploughing. (b) N.A. (c) 11 Kg/ha. (d) 30 cm.\( \times \)23 cm. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) Weeding and hoeing. (ix) N.A. (x) 11, 12.12.60.

2. TREATMENTS:
All combinations of (1) and (2) with 2 extra treatments
(1) 3 levels of trace elements: L₁=5·6, L₂=11·2 and L₃=16·8 Kg/ha.
(2) 5 types of trace elements: T₁=Ca, Sul, T₂=Zn, Sul., T₃=Brax, T₄=Mn, Sul. and T₅=Fe, Sul.
2 extra treatments: E₁=Control (2 plots), and E₂=22·4 Kg/ha. of N as A/S + 22·4 Kg/ha. of P₂O₅ as Super.
22·4 Kg/ha. of N as A/S + 22·4 Kg/ha. of P₂O₅ as Super were applied to all treatments, except extra treatments.

3. DESIGN:
(i) Fact. in R. B. D. (ii) (a) 18. (b) N.A. (iii) 3. (iv) (a) 9·2 m.\( \times \)5·5 m. (b) 7·4 m.\( \times \)3·7 m. (v) 91 cm.\( \times \)91 cm. (vi) Yes.

4. GENERAL:
(i) Crop was damaged due to pigs. (ii) B. H. C. dusting was done. (iii) Yield of grain and fodder. (iv) (a) 1938 and 1960. (b) N.A. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 1010 Kg/ha. (ii) 454·9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
Crop :- Jowar (Kharif).

Site :- Govt. Agri. Res. Farm, Borkhera.

Object :- To study the effect of different types of trace elements at different levels on the yield of Jowar.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) 14.7.62. (iv) (a) 3 ploughings. (b) N.A. (c) 9 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. (vi) R.S.-1. (vii) N.A. (viii) 1 weeding. (ix) N.A. (x) 18, 19.12.62.

2. TREATMENTS:
   All combinations of (1) and (2) with 2 extra treatments.
   (1) 3 levels of trace elements: L1 = 5·6, L2 = 11·2 and L3 = 16·8 Kg/ha.
   2 extra treatments: E0 = Control (2 plots) and E1 = 5·7·2 Kg/ha. of N as A/S + 33·6 Kg/ha. of P2O5 as Super + 33·6 Kg/ha. of K2O as Mur. of Potash.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 21. (b) N.A. (iii) 3. (iv) (a) 9·2 m. x 5·5 m. (b) 7·4 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) to (vii) N.A.

5. RESULTS:
   (i) 455 Kg/ha. (ii) 251·5 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Crop :- Jowar (Kharif).


Object :- To find out the best manuring dose for Jowar under rainfed conditions.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) Nil. (ii) Clay loam. (iii) N.A. (iv) (a) 1 ploughing and 3 bakherings.
   (b) Sowing behind the plough. (c) 8 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) R.S. 1.
   (vii) Unirrigated. (viii) 2 weedings. (ix) and (x) N.A.

2. TREATMENTS:
   4 levels of N as F.Y.M.: $N_0 = 0$, $N_1 = 22.4$, $N_2 = 44.8$ and $N_3 = 89.7$ Kg/ha.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/247 ha. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1959–1963. (b) Yes. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 212 Kg/ha. (ii) 96.0 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<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>134</td>
<td>210</td>
<td>210</td>
<td>295</td>
</tr>
<tr>
<td>C.D.</td>
<td>132.2 Kg/ha</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Jowar (*Kharif*).
Site :- Govt. Agri. Farm, Sawai Madhopur.

Ref :- Rj. 62(39).
Type :- 'M'.

Object :-To study the effect of N, P and K on the yield of Jowar.

1. BASAL CONDITIONS:
   (i) (a) Fallow-Jowar. (b) Fallow. (c) Nil. (ii) N.A. (iii) July, 62. (iv) (a) 2 ploughings. (b) and
   (c) N.A. (d) 46 cm. between rows. (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) 1 weeding.
   (ix) N.A. (x) Nov., 62.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 4 levels of N : $N_0 = 0$, $N_1 = 28.0$, $N_2 = 56.0$ and $N_3 = 84.1$ Kg/ha.
   (2) 3 levels of P$_2$O$_5$: $P_0 = 0$, $P_1 = 28.0$ and $P_2 = 56.0$ Kg/ha.
   (3) 3 levels of K$_2$O: $K_0 = 0$, $K_1 = 28.0$ and $K_2 = 56.0$ Kg/ha.

3. DESIGN:
   (i) 3$^2$x4 confd. (ii) 12 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 6'1 m. x 4'6 m.
   (b) 3'5 m. x 3'7 m. (v) 30 cm. x 45 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) to (vii) N.A.

5. RESULTS:
   (i) 2070 Kg/ha. (ii) 522.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain
   in Kg/ha.
<table>
<thead>
<tr>
<th></th>
<th>( P_1 )</th>
<th>( P_2 )</th>
<th>( P_3 )</th>
<th>( K_1 )</th>
<th>( K_2 )</th>
<th>( K_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_0 )</td>
<td>1893</td>
<td>2170</td>
<td>1892</td>
<td>1984</td>
<td>1829</td>
<td>2141</td>
<td>1985</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>2188</td>
<td>2242</td>
<td>2206</td>
<td>2430</td>
<td>2147</td>
<td>2058</td>
<td>2212</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>1959</td>
<td>2209</td>
<td>1830</td>
<td>2190</td>
<td>1961</td>
<td>1867</td>
<td>2006</td>
</tr>
<tr>
<td>( N_3 )</td>
<td>1947</td>
<td>2212</td>
<td>2072</td>
<td>2072</td>
<td>2312</td>
<td>1847</td>
<td>2077</td>
</tr>
<tr>
<td>Mean</td>
<td>1997</td>
<td>2208</td>
<td>2005</td>
<td>2169</td>
<td>2062</td>
<td>1978</td>
<td>2070</td>
</tr>
<tr>
<td>( K_0 )</td>
<td>2033</td>
<td>2280</td>
<td>2198</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( K_1 )</td>
<td>2103</td>
<td>2246</td>
<td>1838</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( K_2 )</td>
<td>1854</td>
<td>2097</td>
<td>1984</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop :- Jowar (Kharif).**  
**Ref :-** Rj. 62, 63, 64, 65(S.F.T.) for Kota and 63(S.F.T.) for Pali.  
**Site :- (District) : Kota and Pali.**  
**Type :- 'M'.**

Object :- To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients (Type : \( A_1 \)).

1. **BASAL CONDITIONS**:
   (i) (a) to (c) N.A.  (ii) Red and black Grey brown.  (iii) to (vi) N.A.  (vii) Unirrigated.  (viii) to (x) N.A.

2. **TREATMENTS**:
   8 manurial treatments.
   \( O \) = Control (no muree).
   \( N_1 \) = \( 33.6 \) Kg/ha. of N.
   \( N_2 \) = \( 67.2 \) Kg/ha. of N.
   \( P_1 \) = \( 33.6 \) Kg/ha. of \( P_2 \) O.
   \( N_1 P_1 \) = \( 33.6 \) Kg/ha. of \( N_1 \) + \( 33.6 \) Kg/ha. of \( P_2 \) O.
   \( N_1 P_2 \) = \( 67.2 \) Kg/ha. of \( N_1 \) + \( 33.6 \) Kg/ha. of \( P_2 \) O.
   \( N_1 P_3 \) = \( 67.2 \) Kg/ha. of \( N_1 \) + \( 67.2 \) Kg/ha. of \( P_2 \) O.
   \( N_1 P_3 K_1 \) = \( 67.2 \) Kg/ha. of \( N_1 \) + \( 67.2 \) Kg/ha. of \( P_2 \) O + \( 33.6 \) Kg/ha. of \( K_2 \) O.
   N applied as A/S, \( P_2 \) O as Super and \( K_2 \) O as Mur. of Pot.

3. **DESIGN**:
   A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50—100 villages. In each block 36 experiments are conducted in a year of which 11 are of type \( A_1 \), 11 of type \( A_2 \), 11 of type \( A_3 \) and 3 are of type \( C \). The eleven experiments under type \( A_1 \), \( A_2 \) and \( A_3 \) are distributed as 3 on a kharif cereal, 3 on a rabi cereal, 3 on a cash crop, and 2 on oil seed. All the three type—\( C \) experiments are conducted on a legume crop. For the purpose of conducting the \( A_1 \), \( A_2 \) and \( A_3 \) experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type \( A_1 \), \( A_2 \) and \( A_3 \) are laid out. For conducting the three type—\( C \) trials three villages are randomly selected in each block.

4. **GENERAL**:
   (i) to (iii) N.A.  (iv) (a) 1962 to 1966 for Kota and 1963 to 1966 for Pali. (1964 and 1965 N.A.)  (b) and (c) N.A.  (v) to (vii) N.A.
5. RESULTS:

Kota

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₃</th>
<th>N₁P₂K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>129</td>
<td>261</td>
<td>116</td>
<td>297</td>
<td>437</td>
<td>492</td>
<td>577</td>
<td>46.5</td>
</tr>
</tbody>
</table>

Control yield = 470 Kg/ha.; No. of trials = 11.

Pali

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₃</th>
<th>N₁P₂K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>111</td>
<td>217</td>
<td>77</td>
<td>215</td>
<td>350</td>
<td>377</td>
<td>442</td>
<td>67.2</td>
</tr>
</tbody>
</table>

Control yield = 315 Kg/ha.; No. of trials = 4.

Crop: Jowar.

Ref: Rj. 62, 63, 64, 65 (S.F.T.) for Kota and 63 (S.F.T.) for Pali. Type: ‘M’.

Site: (District): Kota and Pali.

Object: To study the response curves of important cereal, cash and oil seed crops to phosphorus applied singly and in combination with other nutrients (Type: A₂).

1. BASAL CONDITIONS:
(i) to (c) N.A.  (ii) Red and black; Grey brown.  (iii) to (vi) N.A.  (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

8 manurial treatments

O = Control (no manure).

N₁ = 33.6 Kg/ha. of N.

P₁ = 33.6 Kg/ha. of P₂O₅.

P₁ = 67.2 Kg/ha. of P₂O₅.

N₁P₁ = 33.6 Kg/ha. of N + 33.6 Kg/ha. of P₂O₅.

N₁P₂ = 33.6 Kg/ha. of N + 67.2 Kg/ha. of P₂O₅.

N₁P₃ = 67.2 Kg/ha. of N + 67.2 Kg/ha. of P₂O₅.

N₁P₂K₁ = 67.2 Kg/ha. of N + 67.2 Kg/ha. of P₂O₅ + 67.2 Kg/ha. of K₂O.

N applied as A/S; P₂O₅ as Super and K₂O as Mur. of Pot.
3. DESIGN:
   Same as in Type A₁ (Unirrigated) on page no. 147.

4. GENERAL:
   (1) to (iii) N.A.  
   (iv) (a) 1962 to 1966 for Kota and 1963 to 1965 for Pali [1964 and 1965 N.A. for Pali]. 
   (b) and (c) N.A.  
   (v) to (vii) N.A.

5. RESULTS:

   **Kota**

   **62 (S.F.T.)**
   Treatment | N₁ | P₁ | P₂ | N₁P₁ | N₂P₂ | N₃P₃ | N₄P₄ | S.E. |
   Av. response of grain in Kg/ha. | 47 | -12 | 12 | 164 | 205 | 296 | 277 | 91:4 |
   Control yield = 548 Kg/ha.; No. of trials = 11.

   **63 (S.F.T.)**
   Treatment | N₁ | P₁ | P₂ | N₁P₁ | N₂P₂ | N₃P₃ | N₄P₄ | S.E. |
   Av. response of grain in Kg/ha. | 135 | 53 | 86 | 159 | 215 | 360 | 448 | 28:5 |
   Control yield = 357 Kg/ha.; No. of trials = 10.

   **64 (S.F.T.)**
   Treatment | N₁ | P₁ | P₂ | N₁P₁ | N₂P₂ | N₃P₃ | N₄P₄ | S.E. |
   Av. response of grain in Kg/ha. | 117 | 119 | 107 | 197 | 261 | 324 | 399 | 56:9 |
   Control yield = 389 Kg/ha.; No. of trials = 9.

   **65 (S.F.T.)**
   Treatment | N₁ | P₁ | P₂ | N₁P₁ | N₂P₂ | N₃P₃ | N₄P₄ | S.E. |
   Av. response of grain in Kg/ha. | 189 | 101 | 169 | 247 | 362 | 443 | 544 | 39:8 |
   Control yield = 400 Kg/ha.; No of trials = 7.

   **Pali**

   **63 (S.F.T.)**
   Treatment | N₁ | P₁ | P₂ | N₁P₁ | N₂P₂ | N₃P₃ | N₄P₄ | S.E. |
   Av. response of grain in Kg/ha. | 126 | 169 | 171 | 183 | 214 | 254 | 509 | 59:1 |
   Control yield = 271 Kg/ha.; No. of trials = 4.

---

**Crop:** Jowar (*Kharif*).  
**Ref:** Rj. 62, 63, 64, 65 (S.F.T.) for Kota and 63 (S.F.T.) for Pali.

**Site:** (District) Kota and Pali.  
**Type:** 'M'.

Object:—To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients (Type : A₂).

1. **BASAL CONDITIONS:**
   (i) N.A.  
   (ii) Red and black; Grey brown.  
   (iii) to (vi) N.A.  
   (vii) Unirrigated.  
   (viii) to (x) N.A.
2. **TREATMENTS**:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>K1</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N1P1K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>441</td>
</tr>
</tbody>
</table>

3. **DESIGN**:

Same as in Type A1 (unirrigated) on page no. 147.

4. **GENERAL**:

(i) to (iii) N.A. (iv) (a) 1962 to 1966 for Kota and 1963 to 1966 for Pali [1964 and 1965 N.A. for Pali]. (b) and (c) N.A. (v) to (vii) N.A.

5. **RESULTS**:

### Kota

62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N1P1K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>122</td>
<td>95</td>
<td>120</td>
<td>237</td>
<td>326</td>
<td>475</td>
<td>496</td>
</tr>
</tbody>
</table>

Control yield = 406 Kg/ha.; No. of trials = 10.

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N1P1K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>117</td>
<td>16</td>
<td>49</td>
<td>191</td>
<td>241</td>
<td>351</td>
<td>345</td>
</tr>
</tbody>
</table>

Control yield = 367 Kg/ha.; No. of trials = 10.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N1P1K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>77</td>
<td>17</td>
<td>83</td>
<td>177</td>
<td>185</td>
<td>291</td>
<td>326</td>
</tr>
</tbody>
</table>

Control yield = 382 Kg/ha.; No. of trials = 11.

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N1P1K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>169</td>
<td>00</td>
<td>76</td>
<td>179</td>
<td>264</td>
<td>323</td>
<td>333</td>
</tr>
</tbody>
</table>

Control yield = 439 Kg/ha.; No. of trials = 7.

### Pali

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N1P1K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>30</td>
<td>42</td>
<td>119</td>
<td>92</td>
<td>148</td>
<td>206</td>
<td>132</td>
</tr>
</tbody>
</table>

Control yield = 439 Kg/ha.; No. of trials = 3.
Crop :- Jowar.  
Site :- (District) Kota.  
Ref :- Rj. 60 (S.F.T).  
Type :- 'M'.

Object :- To study the response of Jowar to levels of N, P and K applied individually and in combination. (Type A)

1. BASAL CONDITIONS :
   (i) N.A.  (ii) Medium black.  (iii) to (x) N.A.

2. TREATMENTS :
   O=Control (no manure).
   n=22.4 Kg/ha. of N as A/S.
   p=22.4 Kg/ha. of P₂O₅ as Super.
   k=22.4 Kg/ha. of K₂O as Mur. Pot.
   np=22.4 Kg/ha. of N as A/S+22.4 Kg/ha. of P₂O₅ as Super.
   nk=22.4 Kg/ha. of N as A/S+22.4 Kg/ha. of K₂O as Mur. Pot.
   pk=22.4 Kg/ha. of P₂O₅ as Super+22.4 Kg/ha. of K₂O as Mur. Pot.
   npk=22.4 Kg/ha. of N as A/S+22.4 Kg/ha. of P₂O₅ as Super+22.4 Kg/ha. K₂O as Mur. Pot.

3. DESIGN :
   (i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on kharif cereal, 8 on arabi cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a legumenous crop. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the four zones at the rate of one experiment per village. (iii) (a) 1/98.8 ha.  (b) 1/197.7 ha.  (iv) Yes.

4. GENERAL :
   N.A.

5. RESULTS :

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N</th>
<th>P</th>
<th>K</th>
<th>S.E.</th>
<th>NP</th>
<th>NK</th>
<th>PK</th>
<th>NPK</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>190</td>
<td>50</td>
<td>0</td>
<td>33.0</td>
<td>10</td>
<td>10</td>
<td>30</td>
<td>14.0</td>
<td></td>
</tr>
</tbody>
</table>

Control yield=450 Kg/ha.; No. of trials=10. 

Crop :- Jowar.  
Site :- (District) : Kota.  
Ref :- Rj. 60(SFT).  
Type :- 'M'.

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses (Type : B).

1. BASAL CONDITIONS :
   (i) N.A.  (ii) Medium black.  (iii) to (x) N.A.

2. TREATMENTS :
   O=Control (no manure).
   n₁=22.4 Kg/ha. of N as A/S
   n₂=44.8 Kg/ha. of N as A/S
   n₃=22.4 Kg/ha. of N as Urea
   n₄=44.8 Kg/ha. of N as Urea
   n₅=22.4 Kg/ha. of N as A/S/N.
   n₆=44.8 Kg/ha. of N as A/S/N.
3. DESIGN:
Same as in Type A₁ on page no. 151.

4. GENERAL:
N.A.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$n_1$</th>
<th>$n_2$</th>
<th>$n'_1$</th>
<th>$n'_2$</th>
<th>$n''_1$</th>
<th>$n''_2$</th>
<th>SE/mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield of grain in Kg/ha.</td>
<td>970</td>
<td>1060</td>
<td>980</td>
<td>970</td>
<td>960</td>
<td>1060</td>
<td>966</td>
</tr>
</tbody>
</table>

Control yield = 760 Kg/ha.

---

Crop: Jowar (Kharif).
Object: To find out suitable combination of seed rate and spacing for Jowar.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Jowar. (c) Nil. (ii) Clay loam. (iii) 8.7.1964; 29.7.1965. (iv) (a) Ploughing and bakhering. (b) Behind the plough. (c) and (d) As per treatments. (e) N.A. (v) Nil. (vi) R.S. I. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 5.12.1964; 8.11.1965.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 seed rates: $R_1 = 4$; $R_2 = 8$ and $R_3 = 12$ Kg/ha.
(2) 3 spacings: $S_1 =$ Broadcasting, $S_2 = 30$ cm. and $S_3 = 60$ cm. between rows.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4 for 64(105); 8 for 65(55). (iv) (a) N.A. (b) 12'5 m. x 10'0 m. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good for 64(105); Fair for 65(55). (ii) N.A. (iii) Yield of grain. (iv) (a) 1964 to 1965. (b) Yes. (c) Nil. (v) and (vi) Nil. (vii) Since the error variances are heterogeneous and the Treatments x years interaction is absent results of individual years are presented under 5. Results.

5. RESULTS:

64(105)
(i) 658 Kg/ha. (ii) 160.0 Kg/ha. (iii) None of effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>679</td>
<td>672</td>
<td>586</td>
<td>646</td>
</tr>
<tr>
<td>640</td>
<td>812</td>
<td>746</td>
<td>733</td>
</tr>
<tr>
<td>618</td>
<td>562</td>
<td>603</td>
<td>594</td>
</tr>
<tr>
<td>Mean</td>
<td>646</td>
<td>682</td>
<td>645</td>
</tr>
</tbody>
</table>

65(55)
(i) 398 Kg/ha. (ii) 105.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
Crop: Jowar (Kharif).

Site: Govt. Agri. Res. Farm, Borkhera.

Object: To find out the suitable spacing and fertilizer requirements of different varieties of Jowar.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) Wheat. (c) Nil.  (ii) Clay loam.  (iii) 17.7.63.  (iv) (a) 2 bakherings, 1 ploughing and patta.  (b) and (c) N.A.  (d) As per treatments.  (e) N.A.  (f) 33.6 Kg/ha. of \( \text{P}_2\text{O}_5 \) as Super and 33.6 Kg/ha. of \( \text{K}_2\text{O} \) as Mur. Pot.  (vi) As per treatments.  (vii) Unirrigated.  (viii) 2 weedings.  (ix) N.A.  (x) 29.11.63.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties: \( V_1 \)=R.S. 1 and \( V_2 \)=Texas.

   Sub-plot treatments
   Strips in one direction:
   6 levels of N: \( N_1=0 \), \( N_2=28 \), \( N_3=56 \), \( N_4=84 \), \( N_5=112 \) Kg/ha. as fertilizer and \( N_6=56 \) Kg/ha. as compost.

   Strips in perpendicular direction:
   3 spacings between rows: \( S_1=30 \), \( S_2=61 \) and \( S_3=91 \) cm.

   N applied at planting.

3. DESIGN:
   (i) Strip-cum-Split-plot.  (ii) (a) 2 main-plots/replication, 18 sub-plots/main-plot (6 strips in one direction and 3 strips in perpendicular direction).  (b) N.A.  (iii) 4.  (iv) (a) 3.7 m. \( \times \) 3.7 m.  (b) 3.1 m. \( \times \) 3.1 m.  (v) 30 cm. \( \times \) 30 cm.  (vi) Yes.

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

5. RESULTS:
   (i) 1530 Kg/ha.  (ii) (a) 389.0 Kg/ha.  (b) S.E.(N)=515.0 Kg/ha., S.E.(S)=305.0 Kg/ha. and S.E.(S \times N)=594.0 Kg/ha.  (iii) Main effect of \( V \) is significant and that of N is highly significant.  (iv) Av. yield of grain in Kg/ha.

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Take the data as provided.
Crop: Jowar (Kharif).
Site: Govt. Agri. Res. Farm, Borkhera.

Object: To study the effect of weedicides on different varieties of Jowar.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Fallow. (c) 628 Kg/ha. of F.Y.M. (ii) Clay loam. (iii) 8.7.61. (iv) (a) 1 ploughing and 1 bakhering. (b) N.A. (c) 13 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) and (ix) N.A. (x) 12.12.61.

2. TREATMENTS:
   Main-plot treatments:
   7 weedical treatments: W₁ = Control, W₂ = 3.9 Kg/ha. of Altrazine, W₃ = 3.9 Kg/ha. of Altrazine, W₄ = 3.9 Kg/ha. of Propazine, W₅ = 7.9 Kg/ha. of propazine, W₆ = 2, 4-D and W₇ = Hand weeding.
   Sub-plot treatments:
   2 varieties: V₁ = R.S. and V₂ = Taxas-630.

3. DESIGN:
   (i) Split-plot. (ii) (a) 7 main-plots/replication, 2 sub-plots/main-plot. (b) N.A. (iii) 8. (ix) (a) and (b) 5.5 m. x 0.9 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Poor growth due to excess of rain and water standing in plots. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 only. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 270 Kg/ha. (ii) (a) 125'2 Kg/ha. (b) 133'3 Kg/ha. (iii) Main effect of V alone is highly significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for V marginal means = 50.7 Kg/ha.
Crop :- Bajra (Kharif).
Site :- Govt. Agri. Farm, Bassi.
Object :- To study the effect of different sources and levels of N with different levels of P on the yield of Bajra.

1. BASAL CONDITIONS :
   (i) (a) Nil.  (b) Fallow for 60(38), 61(48); Oats+ Pea for 62(19).  (c) Nil.  (ii) Sandy loam.  (iii) 8.7.1960 ; 10.7.1961 ; 25.7.1962.  (iv) (a) 3 ploughings.  (b) N.A.  (c) 4·5 Kg/ha.  (d) 30 cm. x 23 cm.  (e) N.A.  (v) N.A.  (vi) R.S. Koroli.  (vii) Unirrigated.  (viii) 2 weedings and hoeing.  (ix) N.A.  (x) 27.10.1960 ; 24.10.1961 ; 9.11.1962.

2. TREATMENTS :
   All combinations of (1), (2), (3) with 3 extra treatments.
   (1) 3 sources of N: S1=A/S, S2=A/S/N and S3=Urea.
   (2) 2 levels of N: N1=16·8 and N2=33·6 Kg/ha.
   (3) 3 levels of P2O5 as Super : P1=0, P2=16·8 and P3=33·6 Kg/ha.
   Extra treatments : E0=0, E1=16·8 and E2=33·6 Kg/ha. of P2O5 as Super.

3. DESIGN :
   (i) Fact. in R.B.D.  (ii) (a) 21.  (b) N.A.  (iii) 3.  (iv) (a) 9·2 m. x 5·5 m.  (b) 7·4 m. x 3·7 m.  (v) 91 cm.  (vi) Yes.

4. GENERAL :
   (i) Normal.  (ii) Nil for 60(38); Betais insects attack controlled by B.H.C. 5% for 61(48); N.A. for 62(19).  (iii) Yield of grain and fodder.  (iv) (a) 1960—1962.  (b) No.  (c) Results of combined analysis given under 5. Results.  (v) and (vi) N.A.  (vii) Error variances are homogeneous and Treatments x years interaction is present.

5. RESULTS :
   (i) 969 Kg/ha.  (ii) 188·4 Kg/ha.  (based on 40 d.f. made up of Treatments x years interaction).  (iii) Main effect of N and extra vs. others' are highly significant and main effect of P is significant.  (iv) Av. yield of grain in Kg/ha.

\[
\begin{array}{ccc|cc|c}
   & P_1 & P_2 & N_1 & N_2 & \text{Mean} \\
S_1 & 993 & 981 & 1091 & 919 & 1124 & 1022 \\
S_2 & 959 & 982 & 1036 & 921 & 1064 & 992 \\
S_3 & 942 & 947 & 1101 & 928 & 1066 & 996 \\
\hline
\text{Mean} & 965 & 970 & 1076 & 923 & 1085 & 1004 \\
\hline
N_1 & 873 & 891 & 1004 & & & \\
N_2 & 1057 & 1049 & 1147 & & & \\
\end{array}
\]

C.D. for N marginal means=59·8 Kg/ha.
C.D. for P marginal means=73·3 Kg/ha.
C.D. for extra treatments vs others=45·7 Kg/ha.

Crop :- Bajra (Kharif).
Site :- Govt. Agri. Exptl. Farm, Durgapur.
Object :- To study the effect of different sources and levels of N with different levels of P on the yield of Bajra.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Linseed; Fallow. (c) N.A. (ii) Sandy loam. (iii) 12.7.1963; 11.7.1964. (iv) (a) 4 ploughings. (b) N.A. (c) 6 Kg/ha. (d) 30 cm. between lines. (e) N.A. (v) N.A. (vi) R.S.K. (vii) Unirrigated. (viii) 2 weedings by hand dhurpi. (ix) 25 cm.; N.A. (x) 4, 5.11.1963 ; 22, 23.10.1964.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 sources of N: S1=A/N, S2=C/A/N and S3=Urea.
   (2) 3 levels of N: N1=0, N2=16.8 and N3=33.6 Kg/ha.
   (3) 3 levels of P2O5 as Super: P1=0, P2=16.8 and P3=33.6 Kg/ha.

3. DESIGN:
   (i) 3 confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9'2 m.×5'5 m. (b) 7'4 m.×3'7 m. (v) 91 cm.×91 cm. (vi) Yes.

4. GENERAL:
   (i) Good; fair. (ii) Damage by cut worm; N.A. (iii) Yield of grain. (iv) (a) 1961 to 1964. Experiment failed in 1962. (b) No. (c) Presented under 5 results. (v) and (vi) N.A. (vii) Error variances are heterogeneous and Treatments × years interaction is absent.

5. RESULTS:

   1963
   (i) 397 Kg/ha. (ii) 184.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

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   1964
   (i) 196 Kg/ha. (ii) 76.5 Kg/ha. (iii) Only the main effect of N is highly significant. (iv) Av. yield of grain in Kg/ha.

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   C.D. for N marginal means =52.9 Kg/ha.
Crop :- *Bajra* (*Khariy*).

Site :- Govt. Agri. Farm, Durgapura.

Object :- To study the effect of different methods of application of N, P and K on the yield of *Bajra*.

1. BASAL CONDITIONS :

(i) (a) N.A. for 63(2); Nil for 64(85). (b) Fallow for 63(2); Wheat for 64(85). (c) Nil. (ii) Sandy loam. (iii) 19.7.1963; 14.7.1964. (iv) (a) N.A. (b) Line sowing. (c) 6 Kg/ha. (d) 30 cm. x 23 cm. for 63(2); 30 cm. between lines for 64(85). (e) N.A. (v) N.A. for 63(2); Nil for 64(85). (vi) R.S.K. (vii) Unirrigated. (viii) 4 hand weedings for 63(2); 1 hand weeding for 64(85). (ix) 65 cm.; 52 cm. (x) 7 to 9.11.1963 for 63(2); 12 to 14.10.1964 for 64(85).

2. TREATMENTS:

Main-plot treatments:

2 methods of application: M<sub>1</sub>=Broadcasting and M<sub>2</sub>=Drilling.

Sub-plot 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>=16'8 and N<sub>2</sub>=33'6 Kg/ha.

(2) 2 levels of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>0</sub>=0 and P<sub>1</sub>=16'8 Kg/ha.

(3) 2 levels of K<sub>2</sub>O as Mur. Pot.: K<sub>0</sub>=0 and K<sub>1</sub>=18'8 Kg/ha.

3. DESIGN :

(i) Split-plot. (ii) (a) 2 main-plots/replication ; 12 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 9'2 m. x 5'5 m. (b) 7'4 m. x 3'7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:

(i) Good for 63(2); N.A. for 64(85). (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1962 to 1964 (Expt. failed in 1962). (b) No. (c) Nil. (v) Tabiji. (vi) Heavy rainfall damaged the crop for 63(2); N.A. for other. (vii) Since the sub-plot error variances are heterogeneous, the results of individual years are presented under 5 Results.

5. RESULTS:

63(2)

(i) 313 Kg/ha. (ii) (a) N.A. (b) 110'0 Kg/ha. (iii) Main effect of N is highly significant. Main effect of P and interactions N x P, and M x P, M x K are significant. (iv) Av. yield of grain in Kg/ha.

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C.D. for N marginal means=64'0 Kg/ha.

C.D. for P marginal means=52'1 Kg/ha.

C.D. for N x P table =90'2 Kg/ha.

C.D. for P or K means at the same level of M=73'9 Kg/ha.

64(85)

(i) 257 Kg/ha. (ii) (a) 223'0 Kg/ha. (b) 216'0 Kg/ha. (iii) Main effect of N is highly significant and interaction M x P is significant. (iv) Av. yield of grain in Kg/ha.

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Crop : Bajra (Kharif).

Site : Govt. Agri. Farm, Durgapura.

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

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Bajra. (c) No. (ii) Sandy loam. (iii) 15.7.1951. (iv) (a) 4 plots/ha. (b) N.A. (c) 6 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. (vi) R.S.J. (vii) Unirrigated. (viii) and (ix) N.A. (x) 22 to 24.10.61.

2. TREATMENTS :
   All combinations of (1) and (2) with 2 extra treatments
   (1) 4 levels of N : N_0=No N, N_1=16.8 Kg/ha. of N as A/S, N_2=N_1+16.8 Kg/ha. of N as F.Y.M, and N_3=33.6 Kg/ha. of N as A/S.
   (2) 3 levels of P_0 as Super : P_0=0, P_1=16.8 and P_2=33.6 Kg/ha.
   Extra treatments are : E_1=16.8 and E_2=33.6 Kg/ha. of F.Y.M of N as F.Y.M.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 3. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.1 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) and (b) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 232 Kg/ha. (ii) 95.4 Kg/ha. (iii) Main effect of N and 'extra treatments vs. others' are highly significant. Interaction N x P is significant. (iv) Av. yield of grain in Kg/ha.
   E_1=91 and E_2=105 Kg/ha.

### Crop Yield Table

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Crop: Bajra (Kharif). Site: Govt. Agri. Farm, Durgapura. 

Object: To study the effect of different sources and levels of N at different levels of P on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 17.7.61. (iv) (a) 4 ploughings. (b) N.A. (c) 6 Kg/ha. (d) 30.5 cm. between row. (e) N.A. (v) N.A. (vi) R.S.J. (vii) Unirrigated. (viii) and (ix) N.A. (x) 26 to 28.10.61.

2. TREATMENTS:
   (i) All combinations of (1), (2) and (3) with 3 extra treatments
   (1) 3 sources of N: S1=A/S, S2=C/A/N and S3=Urea.
   (2) 2 levels of N: N1=16.8 and N2=33.6 Kg/ha.
   (3) 3 levels of P2O5 as Super: P0=0, P1=16.8 and P2=33.6 Kg/ha.
   3 extra treatments are: E0=0, E1=16.8 and E2=33.6 Kg/ha of P2O5 as Super.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 21. (b) N.A. (iii) 3. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) 1961—1963. (b) No. (c) Nil. (v) and (vii) N.A.

5. RESULTS:
   (i) 318 Kg/ha. (ii) 127.1 Kg/ha. (iii) 'E vs. others' is highly significant. Main effects of N, P and S and interaction P x S are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>N1</th>
<th>N2</th>
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<tr>
<td>N2</td>
<td>342</td>
<td>420</td>
<td>422</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C.D. for P or S marginal means = 85.7 Kg/ha.
C.D. for N marginal means = 69.7 Kg/ha.
C.D. for body of P x S table = 148.3 Kg/ha.
C.D. for extra vs. others = 92.3 Kg/ha.

Obj.: To study the effect of inorganic and organic manure with and without P on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 20.7.1961; 16.7.1962; 8.8.1963. (iv) (a) 2 ploughings. (b) Line sowing. (c) 6 Kg/ha. for 61(44); 9 Kg/ha. for others. (d) 30 cm. x 23 cm. (e) N.A. (v) N.A. (vi) Local for 61(46), 62(22); Sikar for 63(1). (vii) Unirrigated. (viii) One weeding and thinning.

2. TREATMENTS:
   All combinations of (1) and (2) with two extra treatments
   (1) 4 levels of N: N_0=No manure, N_1=16.8 Kg/ha. of N as A/S, N_2=16.8 Kg/ha. of N as A/S+16.8 Kg/ha. of N as F.Y.M. and N_3=33.6 Kg/ha. of N as A/S.
   (2) 3 levels of P_0 as Super: P_0=0, P_1=16.8 and P_1=33.6 Kg/ha.

2 Extra treatments: E_1=16.8 and E_2=33.6 Kg/ha. of N as F.Y.M.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 14. (b) N.A (iii) 3. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 em. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Nil for 61(46); N.A. for others. (iii) Yield of grain and fodder. (iv) (a) 1961 to 63. (b) No. (c) Results of combined analysis given under 5. (v) and (vi) N.A. (vii) Error variances are homogeneous, Treatments x years interaction is absent.

5. RESULTS:
   (i) 403 Kg/ha. (ii) 137.8 Kg/ha. (based on 104 d.f. made up of Treatments x years interaction and pooled error). (iii) Main effect of N and 'Extra treatment vs. others' are highly significant. (iv) Av. yield of grain in Kg/ha.

\[
\begin{array}{l|cccc|c}
 & N_0 & N_1 & N_2 & N_3 & \text{Mean} \\
\hline
P_0 & 234 & 410 & 450 & 422 & 379 \\
P_1 & 290 & 468 & 490 & 528 & 444 \\
P_2 & 291 & 536 & 413 & 470 & 427 \\
\hline
\text{Mean} & 272 & 471 & 451 & 473 & 417 \\
\end{array}
\]

C.D. for N marginal means =74.2 Kg/ha.
C.D. for extra treatments vs. others=69.5 Kg/ha.


Obj.: To study the effect of N and P applied as mixture on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 20.7.1961; 21.7.1962; 6.8.1963. (iv) (a) 2 ploughings. (b) N.A. for 61(45), 62(27); Line sowing for 63(7). (c) 6 to 9 Kg/ha. (d) 30 cm. x 23 cm. (e) N.A. (v) N.A. (vi) Local for 61(45), 62(27); Sikar for 63(7). (vii) Unirrigated. (viii) Thinning and weeding.
2. TREATMENTS:

Treatments in one direction:

2 types of application: $A_1$ = Separate and $A_2$ = Applied as a mixture.

Treatments in perpendicular direction:

5 manurial treatments: $M_0$ = Control, $M_1$ = 16.8 Kg/ha of N as A/S + 16.8 Kg/ha of P$_{2}$O$_{5}$, $M_2$ = 16.8 Kg/ha of N + 33.6 Kg/ha of P$_{2}$O$_{5}$, $M_3$ = 33.6 Kg/ha of N and $M_4$ = 33.6 Kg/ha of N + 33.6 Kg/ha of P$_{2}$O$_{5}$.

N applied as A/S and P$_{2}$O$_{5}$ as Super.

3. DESIGN:

(i) Strip-plot. (ii) 2 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (c) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1961 to 1963. (b) N.A. (v) and (vi) N.A. (vii) Since the error variances for (A x M) are heterogeneous, results of individual years are presented under 5.

5. RESULTS:

61(45)

(i) 628 Kg/ha. (ii) (a) 254.3 Kg/ha. for A. (b) 254.5 Kg/ha. for M. (c) 165.2 Kg/ha. for A x M. (iii) Main effect of Malone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$M_0$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
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<td>642</td>
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<td>$A_2$</td>
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<td>642</td>
<td>798</td>
<td>709</td>
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<td>615</td>
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<td>297</td>
<td>639</td>
<td>765</td>
<td>694</td>
<td>745</td>
<td>628</td>
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</tbody>
</table>

C.D. for $M$ marginal means = 277.2 Kg/ha.

62(27)

(i) 646 Kg/ha. (ii) (a) 173.5 Kg/ha. for A. (b) 117.6 Kg/ha. for M. (c) 123.9 Kg/ha. for A x M. (iii) Main effect of M alone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$M_0$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
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<td>659</td>
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<tr>
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<td>718</td>
<td>713</td>
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<td>633</td>
</tr>
<tr>
<td>Mean</td>
<td>456</td>
<td>749</td>
<td>635</td>
<td>712</td>
<td>678</td>
<td>646</td>
</tr>
</tbody>
</table>

C.D. for $M$ marginal means = 128.1 Kg/ha.

63(7)

(i) 283 Kg/ha. (ii) (a) 52.6 Kg/ha. for A. (b) 66.1 Kg/ha. for M. (c) 62.3 Kg/ha. for A x M. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$M_0$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
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<tr>
<td>$A_2$</td>
<td>147</td>
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<td>268</td>
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<tr>
<td>Mean</td>
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<td>251</td>
<td>268</td>
<td>392</td>
<td>344</td>
<td>284</td>
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</tbody>
</table>

C.D. for M marginal means = 71.9 Kg/ha.
Crop: Bajra (Kharif).
Site: Govt. Agri. Farm, Mandore.

Object: To study the effect of different methods of application of N, P and K on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy. (iii) 23.7.62. (iv) (a) 2 ploughings with tractor. (b) Line sowing. (c) 9 Kg/ha. (d) 30 cm. x 23 cm. (e) N.A. (v) Nil. (vi) R.S.K. (vii) Unirrigated. (viii) Hand weeding. (ix) N.A. (x) 21, 23.10.62.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N as A1S: N₀=0, N₁=16·8 and N₂=33·6 Kg/ha.
   (2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=16·8 Kg/ha.
   (3) 2 levels of K₂O as Mur, Pot.: K₀=0 and K₁=16·8 Kg/ha.

   Sub-plot treatments:
   2 methods of application : M₁=Broadcasting and M₂=Drilling.

3. DESIGN:
   (i) Split-plot. (ii) (a) 12 main-plots/replication ; 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9·2 m. x 5·5 m. (b) 7·4 m. x 3·7 m. (v) 91 m. x 91 m. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1962 contd. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. RESULTS:
   (i) 2119 Kg/ha. (ii) (a) 564·3 Kg/ha. (b) 317·7 Kg/ha. (iii) Main effects of N alone is highly significant.
   (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>P₀</th>
<th>P₁</th>
<th>K₀</th>
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<td>2119</td>
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<td>2183</td>
<td>2052</td>
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<td>K₀</td>
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   C.D. for N marginal means=287·3 Kg/ha.

Crop: Bajra (Kharif).
Site: Govt. Agri. Farm, Mandore.

Object: To study the effect of different methods of application of N, P and K on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow, (c) N.A. (ii) Sandy. (iii) 10.8.1963. (iv) (a) 1 ploughing. (b) Line sowing. (c) 9 Kg/ha. (d) 30 cm. x 23 cm. (e) N.A. (v) N.A. (vi) R.S.K. (vii) Unirrigated. (viii) Hand weeding. (ix) N.A. (x) 31.10.63 and 1.11.63.
2. TREATMENTS:
All combinations of (1), (2), (3) and (4)
(1) 2 methods of application: \(M_1\) = Broadcasting and \(M_2\) = Drilling.
(2) 3 levels of N as A/S: \(N_0 = 0\), \(N_1 = 16.8\) and \(N_2 = 33.6\) Kg/ha.
(3) 2 levels of \(P_2O_5\) as Super: \(P_0 = 0\) and \(P_1 = 16.8\) Kg/ha.
(4) 2 levels of \(K_2O\) as Mur. Pot: \(K_0 = 0\) and \(K_1 = 16.8\) Kg/ha.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 4. (iv) (a) 9’2 m. \(\times\) 5’5 m. (b) 7’4 m. \(\times\) 3’7 m. (v) 91 cm. \(\times\) 91 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1962 contd. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 583 Kg/ha. (ii) 206·0 Kg/ha. (iii) Main effect of N, K are highly significant and interactions N \(\times\) K and N \(\times\) P are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>(N_0)</th>
<th>(N_1)</th>
<th>(N_2)</th>
<th>(P_0)</th>
<th>(P_1)</th>
<th>(K_0)</th>
<th>(K_1)</th>
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<td>609</td>
<td>684</td>
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<tr>
<td>(K_1)</td>
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<tr>
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<td>656</td>
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</tr>
</tbody>
</table>

C.D. for N marginal means = 102·8 Kg/ha.
C.D. for K marginal means = 83·9 Kg/ha.
C.D. for means in the body of N \(\times\) P or N \(\times\) K table = 145·4 Kg/ha.

---

Crop :- Brjra (Kharif).
Ref : Rj. 60(37), 61(47), 62(18).
Site :- Govt. Agri. Farm, Tabiji.
Type :- ‘M’.

Object :- To study the effect of different types and levels of nitrogenous fertilizers and different levels of P on Bajra.

1. BASAL CONDITIONS:
(i) (a) Nil, (b) Gram for 60(37); Wheat for 61(47); 62(18). (c) Nil. (ii) Sandy loam. (iii) 8.7.1960; 6.7.1961; 15.7.1962. (iv) (a) 3 to 4 ploughings. (b) Drilling. (c) 5 Kg/ha. (d) 30 cm. \(\times\) 23 cm. (e) N.A. (v) N.A. (vi) N.A. for 60(37); R.S.J. for others. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 13, 14.10.1960; 9 to 11.10.1961; 18, 19.10.1962.

2. TREATMENTS:
All combinations of (1), (2) and (3) with 3 extra treatments
(1) 3 sources of N: \(S_1\) = A/S, \(S_2\) = A/S/N and \(S_3\) = Urea.
(2) 2 levels of N: \(N_1 = 16.8\) and \(N_2 = 33.6\) Kg/ha.
(3) 3 levels of \(P_2O_5\) as Super: \(P_0 = 0\), \(P_1 = 16.8\) and \(P_2 = 33.6\) Kg/ha.
Extra treatments are: \(E_0 = 0\), \(E_1 = 16.8\) and \(E_3 = 33.6\) Kg/ha. of \(P_2O_5\) as Super.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 21. (b) N.A. (iii) 3. (iv) (a) 9’2 m. \(\times\) 5’5 m. (b) 7’4 m. \(\times\) 3’7 m. (v) 91 cm. \(\times\) 91 cm. (vi) Yes.
4. GENERAL:

(i) N.A. for 60(37); 62(18); lodging in some plots for 61(47). (ii) N.A. for 60(37), 62(18); Nit for 61(47). (iii) Yield of grain and fodder. (iv) (a) 1960 to 1962. (b) No. (c) Results of combined analysis given under 5. (v) N.A. (vi) Heavy rainfall for 61(47) resulted some loss in yield in some plots. (vii) Error variances are homogeneous, Treatments\times years interaction is absent.

5. RESULTS:

(i) 1449 Kg/ha. (ii) 239.9 Kg/ha. [based on 160 d.f. made up of interaction of various components of treatments with years and pooled error]. (iii) Main effect of N, interaction P \times N and 'extra treatments vs. others' are highly significant and within extra treatments is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>N1</th>
<th>N2</th>
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</table>

C.D. for N marginal means =73.9 Kg/ha.
C.D. for means in the body of P \times N table=127.9 Kg/ha.
C.D. for 'extra vs. others' =98.2 Kg/ha.
C.D. for extra treatments =221.7 Kg/ha.

Crop :- Bajra (Kharif).
Site :- Govt. Agri. Farm, Tabiji.
Object :-To study the effect of different methods of application of N, P and K on the yield of Bajra.

1. BASAL CONDITIONS:

(i) (a) N.A. for 62(25), 63(3); Wheat for 64(83). (b) Wheat for 62(25), 63(3); Fallow for 64(83). (c) Nil. (ii) Sandy loam. (iii) 3 to 4 ploughings. (b) N.A. for 62(25), 63'3); Behind the plough for 64(83). (c) 6 Kg/ha: (d) 30 em. x 23 em. (e) N.A. (v) Nil for 64(83). (vi) R.S.J. (vii) Unirrigated. (viii) 1 to 2 weedings. (ix) N.A.; 21 cm.; 30 cm. (x) 22, 23.10.1965; 22 to 24.10.1963; 1.11.1964.

2. TREATMENTS:

Main-plot treatments:
2 methods of application of fertilizers : M_1=Broadcasting and M_2=Drilling.

Sub-plot treatments:
All combinations of (1), (2) and (3)
(1) 3 levels of N : N_0=0, N_1=16.8 and N_2=33.6 Kg/ha.
(2) 2 levels of P_2O_5 : P_0=0 and P_1=16.8 Kg/ha.
(3) 2 levels of K_2O : K_0=0 and K_1=16.8 Kg/ha.

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/replication, 12 sub-plots/main-plot. (c) N.A. (iii) 4. (iv) (a) 7'4 m.x 5'5 m. for 62(25), 63(3); 9'2 m.x 5'5 m. for 64(83). (b) 6'2 m.x 4'3 m. for 62(25), 63(3); 7'4 m.x 3'7 m. for 64(83). (v) 61 cm.x 61 cm. for 62(25), 63(3); 91 cm.x 91 cm. for 64(83). (vi) Yes.
4. GENERAL:
(i) N.A. for 62(25), 63(3); Good for 64(83). (ii) N.A. for 62(25), 63(3); Nil for 64(83). (iii) Yield of grain and fodder. (iv) (a) 1962 to 1964. (b) Nil. (v) Mandore and Burgapura. (vi) N.A. for 62(25), 63(3); Draught conditions due to lack of rainfall for 64(83). (vii) Since the sub-plot error variances are heterogeneous, the results of individual years are presented under 5 Results.

5. RESULTS:

62(25)

(i) 951 Kg/ha. (ii) (a) 730 Kg/ha. (b) 321 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

\[\begin{array}{ccc|ccc|cc}
 & N_0 & N_1 & N_2 & P_0 & P_1 & K_0 & K_1 & \text{Mean} \\
M_1 & 744 & 993 & 1119 & 946 & 958 & 938 & 966 & 952 \\
M_2 & 844 & 958 & 1050 & 943 & 959 & 1023 & 879 & 951 \\
Mean & 794 & 975 & 1084 & 944 & 958 & 980 & 922 & 951 \\
\end{array}\]

63(3)

(i) 1533 Kg/ha. (ii) (a) 596 Kg/ha. (b) 267 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.

\[\begin{array}{ccc|ccc|cc}
 & N_0 & N_1 & N_2 & P_0 & P_1 & K_0 & K_1 & \text{Mean} \\
M_1 & 1443 & 1497 & 1668 & 1547 & 1525 & 1489 & 1584 & 1536 \\
M_2 & 1417 & 1585 & 1588 & 1517 & 1542 & 1565 & 1495 & 1530 \\
Mean & 1430 & 1541 & 1628 & 1532 & 1534 & 1527 & 1540 & 1533 \\
\end{array}\]

64(83)

(i) 357 Kg/ha. (ii) (a) 346 Kg/ha. (b) 195 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of grain in Kg/ha.

\[\begin{array}{ccc|ccc|cc}
 & N_0 & N_1 & N_2 & P_0 & P_1 & K_0 & K_1 & \text{Mean} \\
M_1 & 323 & 344 & 456 & 345 & 403 & 404 & 244 & 374 \\
M_2 & 222 & 375 & 419 & 317 & 361 & 328 & 350 & 339 \\
Mean & 272 & 359 & 437 & 331 & 382 & 366 & 347 & 356 \\
\end{array}\]

C.D. for N marginal means = 133 Kg/ha.

\[\begin{array}{ccc|ccc|cc}
 & N_0 & N_1 & N_2 & P_0 & P_1 & K_0 & K_1 & \text{Mean} \\
M_1 & 300 & 375 & 423 & 361 & 371 & 366 & 347 & 356 \\
M_2 & 245 & 344 & 452 & 300 & 393 & & & \\
Mean & 272 & 359 & 437 & 331 & 382 & & & \\
\end{array}\]

C.D. for N marginal means = 97 Kg/ha.
Crop :- Bajra (Kharif).

Site :- Amer (Jaipur, c.f.).

Object :- To study the effect of N, P and K on the yield of Bajra.

1. BASAL CONDITIONS :


2. TREATMENTS :

   5 manurial treatments: \( M_4 = \text{Control} \), \( M_1 = 22.4 \text{ Kg/ha. of N} \), \( M_2 = 22.4 \text{ Kg/ha. of } P_2O_5 \), \( M_3 = 22.4 \text{ Kg/ha. of } K_2O \) and \( M_4 = 22.4 \text{ Kg/ha. of } N + 22.4 \text{ Kg/ha. of } P_2O_5 + 22.4 \text{ Kg/ha. of } K_2O \).

3. DESIGN :

   (i) R.B.D. 5 plots/block and 4 replications. (ii) N.A. (iii) (a) 4.6 m. x 3.7 m. (b) 2.7 m. x 1.8 m. (vi) Yes.

4. GENERAL :

   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) N.A. (b) and (c) No. (v) to (vii) N.A.

5. RESULTS :

   (i) 651 Kg/ha. (ii) 116.7 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

   Treatment
   \[ \begin{align*}
   M_4 & \quad M_1 & \quad M_2 & \quad M_3 & \quad M_4 \\
   \text{Av. yield} & \quad 494 & \quad 857 & \quad 551 & \quad 539 & \quad 813
   \end{align*} \]

Crop :- Bajra,

Site :- (District) Pali.

Type :- 'M'.

Object :- To study the response curves of important, cereal, cash and oil seed crops to nitrogen applied singly and in combination with other nutrients (Type A₁).

1. BASAL CONDITIONS :

   (i) (a) to (c) N.A. (ii) Grey brown (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :

   8 manurial treatments

   \[ \begin{align*}
   0 & \quad = \text{ Control (no manure)} \\
   n_1 & \quad = 33.6 \text{ Kg/ha. of } N \\
   n_2 & \quad = 67.2 \text{ Kg/ha. of } N \\
   n_3 & \quad = 33.6 \text{ Kg/ha. of } P_2O_5 \\
   n_1 p_1 & \quad = 33.6 \text{ Kg/ha. of } N + 33.6 \text{ Kg/ha. of } P_2O_5 \\
   n_2 p_2 & \quad = 67.2 \text{ Kg/ha. of } N + 33.6 \text{ Kg/ha. of } P_2O_5 \\
   n_3 p_3 & \quad = 67.2 \text{ Kg/ha. of } N + 67.2 \text{ Kg/ha. of } P_2O_5 \\
   n_1 p_1 k_1 & \quad = 67.2 \text{ Kg/ha. of } N + 67.2 \text{ Kg/ha. of } P_2O_5 + 33.6 \text{ Kg/ha. of } K_2O \\
   N & \quad \text{ applied as } A_1 S; P_2O_5 \text{ as Super and } K_2O \text{ as Mur. of Pot.}
   \end{align*} \]

3. DESIGN :

   A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A₁, 11 of type A₂, 11 of type A₃ and 3 are of type C. The eleven experiments under type A₁, A₂ and A₃ are distributed as 3 on a kharif cereal, 3 on a rabi cereal, 3 on a cash crop and 2 on oilseed. All the three type-C experiments are conducted on a legume crop. For the purpose of conducting the A₁, A₂ and A₃ experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type A₁, A₂ and A₃ are laid out. For conducting the three type-C trials three villages are randomly selected in each block.
4: GENERAL:

(i) to (iii) N.A.  
(iv) (a) 1962 to 1966 [1963—N.A.].  
(b) and (c) N.A.  
(v) to (vii) N.A.

5. RESULTS:

62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>N_2</th>
<th>P_1</th>
<th>N_2P_1</th>
<th>N_3P_1</th>
<th>N_4P_2</th>
<th>N_5P_2K_1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>153</td>
<td>122</td>
<td>114</td>
<td>171</td>
<td>133</td>
<td>168</td>
<td>195</td>
<td>62:4</td>
</tr>
</tbody>
</table>

Control yield=527 Kg/ha.; No. of trials=3.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>N_2</th>
<th>P_1</th>
<th>N_2P_1</th>
<th>N_3P_1</th>
<th>N_4P_2</th>
<th>N_5P_2K_1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>84</td>
<td>115</td>
<td>34</td>
<td>110</td>
<td>166</td>
<td>196</td>
<td>230</td>
<td>22:6</td>
</tr>
</tbody>
</table>

Control yield=522 Kg/ha.; No. of trials=6.

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>N_2</th>
<th>P_1</th>
<th>N_2P_1</th>
<th>N_3P_1</th>
<th>N_4P_2</th>
<th>N_5P_2K_1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>25</td>
<td>30</td>
<td>24</td>
<td>36</td>
<td>60</td>
<td>70</td>
<td>74</td>
<td>11:0</td>
</tr>
</tbody>
</table>

Control yield=99 Kg/ha.; No. of trials=5

Crop :-Bajra.  
Ref :- Rj. 62, 64, 65 (SFT).  
Site :- (District) Pali.  
Type :- 'M'.

Object :-To study response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients (Type : A_2).

1. BASAL CONDITIONS:

(i) (a) to N.A.  
(ii) Grey brown.  
(iii) to (vi) N.A.  
(vii) Unirrigated.  
(viii) to (x) N.A.

2. TREATMENTS:

8 manurial treatments

0=Control (no manure).  
n_1=33:6 Kg/ha. of N  
p_1=33:6 Kg/ha. of P_2O_5  
p_2=67:2 Kg/ha. of P_2O_5  
n_1p_1=33:6 Kg/ha. of N+33:6 Kg/ha. of P_2O_5  
n_1p_2=33:6 Kg/ha. of N+67:2 Kg/ha. of P_2O_5  
n_2p_1=33:6 Kg/ha. of N+67:2 Kg/ha. of P_2O_5  
n_1p_2k_1=67:2 Kg/ha. of N+67:2 Kg/ha. of P_2O_5 + 67:2 Kg/ha. of K_2O  
N applied as A/S, P_2O_5 as Super and K_2O as Mur. of Pot.

3. DESIGN:

Same as in type A_1 (unirrigated) on page 168.

4. GENERAL:

(i) to (iii) N.A.  
(iv) (a) 1962 to 1966 [1963—N.A.].  
(b) and (c) N.A.  
(v) to (vii) N.A.

5. RESULTS:

62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>P_1</th>
<th>P_2</th>
<th>N_2P_1</th>
<th>N_3P_1</th>
<th>N_4P_2</th>
<th>N_5P_2K_1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>112</td>
<td>104</td>
<td>90</td>
<td>127</td>
<td>109</td>
<td>123</td>
<td>149</td>
<td>56:0</td>
</tr>
</tbody>
</table>

Control yield=335 Kg/ha.; No. of trials=4.
Crop: Bajra (Kharif).  
Ref: Rj. 62, 64, 65(S.F.T).

Site: (District) Pali.  
Type: ‘M’.

Object: To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients (Type: A).  

1. BASAL CONDITIONS:
   (i) N.A.  (ii) Grey brown.  (iii) to (vi) N.A.  (vii) Unirrigated.  (viii) to (x) N.A.

2. TREATMENTS:
   8 manurial treatments:
   0 = Control (no manure).
   \( n_1 = 33.6 \) Kg/ha. of N.
   \( k_1 = 67.2 \) Kg/ha. of K.
   \( n_2 = 67.2 \) Kg/ha. of N.
   \( n_2 k_2 = 67.2 \) Kg/ha. of N.
   \( n_1 p_1 k_1 = 33.6 \) Kg/ha. of N.
   N applied as A/S, P as Super and K as Mur. of Pot.

3. DESIGN:
   Same as in Type A (unirrigated) on page 168.

4. GENERAL:
   (i) to (iii) N.A.  (iv) (a) 1962 to 1966 [1963-N.A.]  (b) and (c) N.A.  (v) to (vii) N.A.

5. RESULTS:
   62(S.F.T.)
   Treatment
   Av. response of grain in Kg/ha.
   N1  K1  K2  N1K1  N1K2  N1P1K1  S.E.
   184  115  237  199  188  175  231  73.5
   Control yield = 488 Kg/ha.; No. of trials = 3.

   64(S.F.T.)
   Treatment
   Av. response of grain in Kg/ha.
   N1  K1  K2  N1K1  N1K2  N1P1K1  S.E.
   67  65  103  102  120  159  156  22.5
   Control yield = 538 Kg/ha.; No. of trials = 6.
Crop: Bajra.  
Site: (District) Pali and Sriganganagar.  
Object: To study the response of Bajra to levels of N, P and K applied individually and in combinations (Type: A).

1. BASAL CONDITIONS:
   (i) N.A.  (ii) Desert soil.  (iii) to (x) N.A.

2. TREATMENTS:
   0 = Control (no manure).
   \( \text{N} \) = 22.4 Kg/ha. of N as A/S.
   \( \text{P} \) = 22.4 Kg/ha. of \( \text{P}_2\text{O}_5 \) as Super.
   \( \text{K} \) = 22.4 Kg/ha. of \( \text{K}_2\text{O} \) as Mur. Pot.
   \( \text{NP} \) = 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of \( \text{P}_2\text{O}_5 \) as Super.
   \( \text{NK} \) = 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of \( \text{K}_2\text{O} \) as Mur. Pot.
   \( \text{PK} \) = 22.4 Kg/ha. of \( \text{P}_2\text{O}_5 \) as Super + 22.4 Kg/ha. of \( \text{K}_2\text{O} \) as Mur. Pot.
   \( \text{NPK} \) = 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of \( \text{P}_2\text{O}_5 \) as Super + 22.4 Kg/ha. of \( \text{K}_2\text{O} \) as Mur. Pot.

3. DESIGN:
   (i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on kharif cereal, 8 on rabi cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per villages. (iii) (a) 1/98.8 ha.  (b) 1/197.6 ha.  (iv) Yes.

4. GENERAL:
   (i) to (vii) N.A.

5. RESULTS:

<table>
<thead>
<tr>
<th>District</th>
<th>No. of trials</th>
<th>Control yield</th>
<th>N</th>
<th>P</th>
<th>K</th>
<th>S.E.</th>
<th>NP</th>
<th>NK</th>
<th>PK</th>
<th>NPK</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pali</td>
<td>3</td>
<td>650</td>
<td>120</td>
<td>70</td>
<td>110</td>
<td>53.0</td>
<td>-30</td>
<td>-50</td>
<td>20</td>
<td>0</td>
<td>45.0</td>
</tr>
<tr>
<td>Sriganganagar</td>
<td>3</td>
<td>820</td>
<td>170</td>
<td>40</td>
<td>-10</td>
<td>25.0</td>
<td>-30</td>
<td>-20</td>
<td>-20</td>
<td>40</td>
<td>22.0</td>
</tr>
</tbody>
</table>

Crop: Bajra.  
Site: (District) Pali and Sriganganagar.  
Object: To investigate the relative efficiency of different nitrogenous fertilizers at different doses (Type: B).

1. BASAL CONDITIONS:
   (i) N.A.  (ii) Desert soil.  (iii) to (x) N.A.
2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control (no manure)</td>
<td>$n_1^* = 22.4$ Kg/ha. of N as A/S/N.</td>
</tr>
<tr>
<td>Manure</td>
<td>$n_{1'} = 44.8$ Kg/ha. of N as A/S/N.</td>
</tr>
<tr>
<td>Manure</td>
<td>$n_{2'} = 22.4$ Kg/ha. of N as C/A/N.</td>
</tr>
<tr>
<td>Manure</td>
<td>$n_{2''} = 44.8$ Kg/ha. of N as C/A/N.</td>
</tr>
</tbody>
</table>

3. DESIGN:

Same as in type A on page 171.

4. GENERAL:

(i) to (vii) N.A.

5. RESULTS:

Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>District</th>
<th>No. of trial</th>
<th>Control</th>
<th>$n_1$</th>
<th>$n_2$</th>
<th>$n_{1'}$</th>
<th>$n_{2'}$</th>
<th>$n_{1''}$</th>
<th>$n_{2''}$</th>
<th>G.M.</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pali</td>
<td>2</td>
<td>480</td>
<td>-</td>
<td>-</td>
<td>620</td>
<td>680</td>
<td>720</td>
<td>570</td>
<td>920</td>
<td>1060</td>
</tr>
<tr>
<td>Sriganganagar</td>
<td>3</td>
<td>920</td>
<td>1100</td>
<td>1300</td>
<td>880</td>
<td>1100</td>
<td>-</td>
<td>-</td>
<td>1110</td>
<td>1150</td>
</tr>
</tbody>
</table>

Crop :- Bajra (Kharif).
Site :- Govt. Agri. Farm, Mandore.
Type :- 'MV'.

Object :- To study the effect of different methods of application of N and P on different varieties of Bajra.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat for 63(37); Fallow for 64(31); N.A. for 65(9). (c) N.A. for 63(37), 65(9); Nil for 64(31). (ii) Sandy loam. (iii) 8.8.1963; 10.7.1964; 20.7.1965. (iv) (a) 1 discing and 2 cultivations for 63(37); 2 ploughings and discing for others. (b) Line sowing behind the plough. (c) 8 Kg/ha. for 63(37), 64(31); 4.4 Kg/ha. for 65(9). (d) 23 to 30 cm. between rows for 63(37), 64(31); N.A. for 65(9). (e) N.A. (v) N.A. for 63(37), 64(31); Nil for 64(31). (vi) As per treatments. (vii) Unirrigated. (viii) One weeding. (ix) N.A. for 63(37), 65(9); 20 cm. for 64(31). (x) 24 to 27.10.1963; 5, 6.10.1964; 29.10.1965.

2. TREATMENTS:

Main-plot treatments:

All combinations of (1) and (2)

(1) 2 varieties: $V_1$ = Local and $V_2$ = R.S.J.

(2) 2 methods of applications: $M_1$ = Broadcasting and $M_2$ = Placement before the seed.

Sub-plot treatments:

8 manurial treatments: $F_0$ = Control, $F_1$ = 16.8 Kg/ha. of N, $F_2$ = 33.6 Kg/ha. of N, $F_3$ = 16.8 Kg/ha. of P.O., $F_4 = F_1 + F_2$, $F_5 = F_1 + F_3$, $F_6 = 16.8$ Kg/ha. of N as top dressing and $F_7$ = 16.8 Kg/ha. of N + 16.8 Kg/ha. of P.O.S + 16.8 Kg/ha. of N as top dressing.

N as A/S applied in 2 splits, ½ at sowing and ½ one month after sowing, P.O.S as super applied at sowing.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 9·1 m. x 5·5 m. (b) 8·5 m. x 4·9 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:

(i) N.A. for 63(37); Good for 63(31); poor for 65(9). (ii) N.A. for 63(37); Nil for others. (iii) Yield of grain. (iv) (a) 1963 to 1965. (b) No. (c) Results of combined analysis given under 5. (v) N.A. (vi) Nil. (vii) Both the error variances and homogeneous, interaction main-plot Treatments x years interaction is absent while sub-plot Treatments x years interaction is present.
5. RESULTS:

(i) 651 Kg/ha. (ii) (a) 261.0 Kg/ha. (based on 24 d.f. made up of Treatments x years interactions and pooled error). (b) 177.5 Kg/ha. (based on 42 d.f. made up of various components of Treatments x years interactions). (iii) Main effect of F alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>F₃</th>
<th>F₄</th>
<th>F₅</th>
<th>F₆</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>548</td>
<td>690</td>
<td>718</td>
<td>602</td>
<td>670</td>
<td>758</td>
<td>680</td>
</tr>
<tr>
<td>V₂</td>
<td>538</td>
<td>607</td>
<td>714</td>
<td>552</td>
<td>647</td>
<td>707</td>
<td>622</td>
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<tr>
<td>Mean</td>
<td>543</td>
<td>648</td>
<td>716</td>
<td>577</td>
<td>658</td>
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<tr>
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<td>637</td>
<td>712</td>
<td>632</td>
<td>678</td>
<td>746</td>
<td>660</td>
</tr>
<tr>
<td>M₂</td>
<td>541</td>
<td>660</td>
<td>720</td>
<td>522</td>
<td>640</td>
<td>718</td>
<td>642</td>
</tr>
</tbody>
</table>

C.D. for F marginal means=84.5 Kg/ha.

---

Crop :- Bajra (Kharif).
Site :- Govt. Agri. Farm, Hemawas.
Ref :- Rj. 64(30).
Type :- 'MV'.

Object :- To study the effect of different levels of N and P on the yield of different varieties of Bajra.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Heavy. (iii) 2.7.64. (iv) (a) and (b) N.A. (c) 10 Kg/ha. (d) Between lines 30 cm. (e) N.A. (f) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) 4.10.64.

2. TREATMENTS:

All combinations of (1), (2) and (3)
(1) 3 levels of N : N₀=0, N₁=16.8 and N₂=33.6 Kg/ha.
(2) 3 levels of P₀O₄ : P₀=0, P₁=16.8 and P₂=33.6 Kg/ha.
(3) 2 varieties : V₁=Local and V₂=R.S.J.

3. DESIGN:

(i) 3² x 2 confd. (ii) (a) 6 plots/block ; 3 blocks/replication. (b) N.A.(iii) 2. (iv) (a) and (b) 5.5 m. x 3.7 m. (v) Nil. (vi) Ye.

4. GENERAL:

(i) Good ; lodging in plots of higher levels of N. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—N.A. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 1038 Kg/ha. (ii) 187.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
Crop: Bajra (Kharif).

Site: Govt. Agri. Farm, Durgapur.

Ref: Rj. 60(72), 61(74).

Type: ‘C’.

Object: To study the effect of different seed rates and spacings on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Bajra-Fallow. (b) Fallow. (c) 16'8 Kg/ha. of N. (ii) N.A. (iii) July. 1960 for 60(72); 10.7.1961 for 61(74). (iv) (a) 2 ploughings. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) R.S.K. for 60(72); R.S.J. for 61(74). (vii) Unirrigated. (viii) 1 weeding. (ix) N.A. (x) Sept., 1960 for 60(72); 26.10.1961 for 61(74).

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 seed rates: $R_1=2$, $R_2=4$, $R_3=7$ and $R_4=9$ Kg/ha.
   (2) 4 spacing between rows: $S_1=23$, $S_2=30$, $S_3=38$ and $S_4=46$ cm.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 6'1 m.$\times$4'6 m. (b) 5'5 m.$\times$4'0 m. (v) 30 cm. $\times$30 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960 to 1961. (b) No. (c) Results of combined analysis are given under S. (v) and (vi) N.A. (vii) Error variances are heterogeneous, Treatments $\times$ years interaction is present.

5. RESULTS:
   (i) 401 Kg/ha. (ii) 281'4 Kg/ha. based on (15 d.f. made up of Treatments $\times$ years interaction). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<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>607</td>
<td>544</td>
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<td>$R_2$</td>
<td>448</td>
<td>565</td>
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<td>$R_3$</td>
<td>377</td>
<td>274</td>
<td>392</td>
<td>290</td>
<td>333</td>
</tr>
<tr>
<td>$R_4$</td>
<td>456</td>
<td>338</td>
<td>277</td>
<td>258</td>
<td>332</td>
</tr>
<tr>
<td>Mean</td>
<td>472</td>
<td>430</td>
<td>386</td>
<td>318</td>
<td>401</td>
</tr>
</tbody>
</table>

Crop: Bajra (Kharif).

Site: Govt. Agri. Farm, Mandore.

Ref: Rj. 62(35), 63(38).

Type: ‘C’.

Object: To study the effect of different seed rates and spacings on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Fallow-Bajra for 62(35); Nil for 63(38). (b) Fallow for 62(35); Wheat for 63(38). (c) Nil for 62(35); N.A. for 63(38). (ii) Sandy loam. (iii) 23.7.1962; 6.8.1963. (iv) (a) 2 ploughings for 62(35); 1 discing and 2 cultivations for 63(38). (b) Line sowing behind the plough. (c) and (d) As per treatments. (e) N.A. (v) 33'6 Kg/ha. of N as A/S + 16'8 Kg/ha. of P$_2$O$_5$ as Super. (vi) R.S.J. for 62(35); Chadi (local) for 63(38). (vii) Unirrigated. (viii) 1 weeding. (ix) N.A. (x) 3.10.1962; 20.10.1963.

2. TREATMENTS and 3. DESIGN:
   Same as in expts. no. 60(72), 61(74) above

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1962 to 1963. (b) N.A. (c) Results of combined analysis are given under S. (v) and (vi) N.A. (vii) Error variances are heterogeneous, Treatments $\times$ years interaction is present.
5. RESULTS:

(i) 743 Kg/ha. (ii) 246.2 Kg/ha. (based on 15 d.f. made up of Treatments x years interaction). (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>Mean</th>
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</thead>
<tbody>
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<td>788</td>
<td>723</td>
<td>622</td>
<td>717</td>
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<tr>
<td>S2</td>
<td>934</td>
<td>797</td>
<td>798</td>
<td>727</td>
<td>814</td>
</tr>
<tr>
<td>S3</td>
<td>700</td>
<td>781</td>
<td>778</td>
<td>639</td>
<td>724</td>
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<tr>
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<td>740</td>
<td>749</td>
<td>724</td>
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<td>717</td>
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<tr>
<td>Mean</td>
<td>777</td>
<td>779</td>
<td>756</td>
<td>661</td>
<td>743</td>
</tr>
</tbody>
</table>

CROP: Bajra (Kharif).

SITE: Govt. Agri. Farm, Mandore.

OBJECT: To study the effect of N, P, and spacings on the yield of Bajra.

1. BASAL CONDITIONS:

(i) (a) Fallow-Bajra. (b) Fallow. (c) Nil. (ii) N.A. (iii) 22-7-1961; 21.7.1962. (iv) (a) 2 to 3 ploughings. (b) Drilling. (c) 2 to 3 Kg/ha. (d) As per treatments. (e) N.A. (f) R.S.K. and R.S.J. (vii) Unirrigated. (viii) 1 weeding. (ix) N.A. (x) 22.10.1961; 1.10.1962.

2. TREATMENTS AND 3. DESIGN:

Same as in expts. nos. 60(71), 61(76) on page 176.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain. (iv) to (vi) N.A. (vii) Both the error variances are homogenous and main and sub-plot Treatments x years interactions are absent.

5. RESULTS:

(i) 1282 Kg/ha. (ii) (a) 344.6 Kg/ha. (based on 24 d.f. on account of pooled error and main-plot Treatments x years interactions). (b) 149.5 Kg/ha. (based on 46 d.f. on account of pooled error and various interactions with years). (iii) Main effect of N and interaction P x S are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>P2</th>
<th>P1</th>
<th>P3</th>
<th>S1</th>
<th>S2</th>
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<td>N0</td>
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<td>1247</td>
<td>1310</td>
<td>1246</td>
<td>1327</td>
<td>1308</td>
</tr>
<tr>
<td>N2</td>
<td>1318</td>
<td>1377</td>
<td>1278</td>
<td>1315</td>
<td>1395</td>
<td>1263</td>
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<tr>
<td>Mean</td>
<td>1288</td>
<td>1292</td>
<td>1267</td>
<td>1270</td>
<td>1309</td>
<td>1268</td>
</tr>
</tbody>
</table>

C.D. for N marginal means=70.9 Kg/ha.

C.D. for body of P x S table=290.4 Kg/ha.
Crop :- Bajra (Kharif).

Site :- Govt. Agri. Farm, Bassi.

Object :- To study the effect of N, P and spacings on the yield of Bajra.

1. BASAL CONDITIONS :
   (i) (a) Bajra-Fallow. (b) Fallow. (c) N.A. (ii) N.A. (iii) 18.7.1960 ; 13.7.1961. (iv) (a) 3 ploughings.
   (b) Drilling. (c) 2 Kg/ha. (d) As per treatments. (e) N.A. (v) N.A. (vi) R.S.J. (vii) Unirrigated.

2. TREATMENTS:
   Main-plot treatments :
   All combinations of (1) and (2)
   (1) 3 levels of P2O5 as Super: P0 =0, P1 =16.8 and P2 =33.6 Kg/ha.
   (2) 3 row spacings: S1 =30, S2 =38 and S3 =46 cm.
   Sub-plot treatments :
   3 levels of N as A/S : N0 =0, N1 =16.8 and N2 =33.6 Kg/ha.
   N applied in 2 splits, \( \frac{1}{4} \) at sowing and \( \frac{1}{4} \) one month after sowing and P applied at the time of sowing.

3. DESIGN :
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960-1961. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Both the error variances are homogeneous. Main-plot Treatments × years interaction is present while sub-plot Treatments × years interaction is absent.

4. RESULTS :
   (i) 625 Kg/ha. (ii) (a) 338.1 Kg/ha. (based on 8 d.f. on account of interaction main-plot Treatments with years). (b) 131.2 Kg/ha. (based on 46 d.f. on account of interaction of sub-plot Treatments with years and pooled error). (iii) Main effect of N and interaction N×P are highly significant. (iv) Av. yield of grain in Kg/ha.

\[
\begin{array}{cccc|ccc|c}
   & P_0 & P_1 & P_2 & S_0 & S_1 & S_2 & \text{Mean} \\
N_0 & 518 & 500 & 564 & 486 & 557 & 539 & 527 \\
N_1 & 461 & 624 & 744 & 628 & 612 & 588 & 609 \\
N_2 & 563 & 762 & 892 & 736 & 772 & 710 & 739 \\
\text{Mean} & 514 & 629 & 733 & 617 & 647 & 612 & 625 \\
S_0 & 464 & 670 & 717 & & & & \\
S_1 & 488 & 644 & 810 & & & & \\
S_2 & 590 & 572 & 669 & & & & \\
\end{array}
\]

C.D. for N marginal means = 62.3 Kg/ha.
C.D. for N means at the same level of P = 107.9 Kg/ha.
C.D. for P means at the same level of N = 203.5 Kg/ha.
Crop :- Bajra (Kharif).
Site :- Govt. Agri. Farm, Bassi.

Object :- To study the effect of doses and formulations of weedicides in the control of weeds in Bajra.

1. BASAL CONDITIONS:
   (i) (a) Moong-Bajra for 61(9); Fallow-Green-Bajra for 62(10). (b) Moong for 61(9); Gram for 62(10).
   (c) N.A. for 61(9); Nil for 62(10). (ii) Sandy loam. (iii) 15.7.1961 ; 26.7.1962. (iv) (a) 3 ploughings.
   (b) N.A. (c) 4 to 7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. (vi) R.S.K. (vii) Unirrigated.
   (viii) and (ix) N.A. (x) 28.10.1961 ; 17.11.1962.

2. TREATMENTS:
   All combinations of (1) and (2) with 2 extra treatments
   (1) 4 types of weedicides: W1 = Sodium salt of 2, 4-D, W2 = Ethylester of 2, 4-D, W3 = Amine salt of
      2, 4-D and W4 = Sodium salt of M.C.P.A.
   (2) 3 doses of weedicides: D1 = 0.6, D2 = 1.1 and D3 = 1.7 Kg/ha. of acid equivalent.
   Extra treatments are : E0 = Control and E1 = Hand weeding.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (iv) (a) 7.3 m. x 5.5 m. (b) 5.5 m. x 3.7 m. (v) 91 cm. x
      91 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1961 to 1962. (b) No. (c) Nil. (v) and (vi) N.A.
   (vii) Since the error variances are heterogeneous and the Treatments x years interaction is absent, results of
   individual years are presented under 5. Results.

5. RESULTS:
   61(9)
   (i) 387 Kg/ha. (ii) 234.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in
   Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>D1</td>
<td>400</td>
<td>472</td>
<td>371</td>
<td>474</td>
<td>429</td>
</tr>
<tr>
<td>D2</td>
<td>544</td>
<td>346</td>
<td>160</td>
<td>215</td>
<td>316</td>
</tr>
<tr>
<td>D3</td>
<td>232</td>
<td>474</td>
<td>386</td>
<td>486</td>
<td>394</td>
</tr>
<tr>
<td>Mean</td>
<td>392</td>
<td>431</td>
<td>306</td>
<td>392</td>
<td>380</td>
</tr>
</tbody>
</table>

   62(10)
   (i) 586 Kg/ha. (ii) 169.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in
   Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>D1</td>
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<td>598</td>
<td>523</td>
<td>519</td>
</tr>
<tr>
<td>D2</td>
<td>598</td>
<td>511</td>
<td>692</td>
<td>709</td>
<td>628</td>
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<tr>
<td>Mean</td>
<td>553</td>
<td>569</td>
<td>615</td>
<td>597</td>
<td>584</td>
</tr>
</tbody>
</table>
Crop :- Bajra (Kharif).

Site :- Govt. Agri. Farm, Bassi.

Object :- To find out the economic way of controlling weeds in Bajra.

1. BASAL CONDITIONS:
   (i) (a) N.A. for 60(20); Fallow-Gram-Bajra for 62(5). (b) Bajra for 60(20); Gram for 62(5). (c) N.A. for 60(20); Nil for 62(5). (ii) Sandy loam. (iii) 7.7.1960; 26.7.1962. (iv) (a) 3 to 4 ploughings. (b) N.A. (c) 7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. (vi) T5 for 60(20); R.S.K. for 62(5). (vii) Unirrigated. (viii) and (ix) N.A. (x) 28.10.1960; 16.11.1962.

2. TREATMENTS:
   9 methods of controlling weeds : W0 = Control (no weeding), W1 = Local methods of weeding, W2 = Pre-emergence application, W3 = Post emergence application (once), W4 = Post emergence application (twice), W5 = Pre emergence+Post emergence application, W6 = Pre emergence application+weeding, W7 = Post emergence application+weeding and W8 = Pre emergence+Post emergence application+weeding.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 7 '3 m. x 5' 5 m. (b) 5' 5 m. x 3' 7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960-1962 (Expt. for 1961 N.A.). (b) No. (c) Results of combined analysis are given under 5. (v) and (vi) N.A. (vii) Error variances are heterogeneous, Treatments x years interaction is present.

5. RESULTS:
   (i) 378 Kg/ha. (ii) 190-0 Kg/ha. (based on 8 d.f. made up of Treatments x years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W0</th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W4</th>
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<th>W6</th>
<th>W7</th>
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<td>Av. yield</td>
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<td>332</td>
<td>302</td>
<td>364</td>
<td>264</td>
<td>474</td>
<td>398</td>
<td>394</td>
</tr>
</tbody>
</table>

Crop :- Bajra (Kharif).

Site :- Govt. Agri. Farm, Bassi.

Object :- To study the effect of fungicides in controlling the disease in Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) Nil. (ii) Sandy. (iii) 8.7.60. (iv) (a) 4 ploughings. (b) Dibbling. (c) N.A. (d) Row to row 30 cm. (e) N.A. (v) N.A. (vi) T5. (vii) Unirrigated. (viii) and (ix) N.A. (x) 27.10.60.

2. TREATMENTS:
   8 fungicidal treatments : T0 = Control (no application), T1 = Agrosan G.N. at 4 gm., T2 = Ceresan at 3 gm., T3 = Tillex at 3 gm., T4 = Lunasan at 3 gm., T5 = Hervasan at 3 gm., T6 = Fernasan at 4 gm. and T7 = Sulphur at 6 gm.

   Treatments given to per Kg. of seed as dressing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 4' 6 m. x 1' 8 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Incidence of green ear and smut-disease and control measures as per treatments. (iii) Yield of grain. (iv) (a) 1958 to 1961. (b) No. (c) Nil. (v) to (vii) N.A.
5. RESULTS:
(i) 565 Kg/ha. (ii) 99·6 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
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<tbody>
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<td>Av. yield</td>
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<td>548</td>
<td>593</td>
<td>593</td>
<td>604</td>
<td>633</td>
<td>548</td>
<td>509</td>
</tr>
</tbody>
</table>

Crop :- Bajra (Kharif).
Site :- Govt. Agri. Farm, Bassi.

Object :- To study the effect of fungicides in controlling the disease in Bajra.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 17.7.61. (iv) (a) 4 ploughings. (b) Dibbling. (c) N.A. (d) Row to rows 30 cm. (e) N.A. (v) N.A. (vi) R.S.K. (vii) Unirrigated. (viii) Weeding and thinning. 
(ix) N.A. (x) 1.11.61.

2. TREATMENTS:
8 fungicidal treatments : T₀=Control, T₁=Agrosan G.N. at 4 gm., T₂=Cerosan at 3 gm., T₃=Tillex at 3 gm., T₄=Lunasan at 3 gm., T₅=Hervasan at 3 gm., T₆=Thiram at 4 gm. and T₇=Sulphur at 4 gm.
Treatments given to per Kg. of seed as dressing.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 4·6 m.×2·7 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1958 to 1961. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Experiment conducted during 1960 N.A.

5. RESULTS:
(i) 817 Kg/ha. (ii) 311·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>781</td>
<td>707</td>
<td>794</td>
<td>894</td>
<td>1015</td>
<td>650</td>
<td>853</td>
<td>843</td>
</tr>
</tbody>
</table>

Crop :- Bajra (Kharif).
Site :- Govt. Agri. Farm, Durgapura.

Object :- To study the effect of different doses and formulations of weedicides in the control of weeds in Bajra.

1. BASAL CONDITIONS:
(i) (a) T/F-Fallow-Bajra. (b) Til. (c) Nil. (ii) Sandy loam. (iii) 20.7.62. (iv) (a) 2 ploughings. (b) N.A. (c) 5 Kg/ha. (d) and (e) N.A. (v) N.A. (vi) R.S.K. (vii) Unirrigated. (viii) and (ix) N.A. (x) 3.11.62.

2. TREATMENTS and 3. DESIGN:
Same as in expt. no. 61(9), 62(10) on page 177.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1962 only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 321 Kg/ha. (ii) 259·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
E₀ = 80 and E₁ = 378 Kg/ha.

<table>
<thead>
<tr>
<th>D₁</th>
<th>W₁</th>
<th>W₂</th>
<th>W₃</th>
<th>W₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>238</td>
<td>314</td>
<td>502</td>
<td>359</td>
<td></td>
<td>353</td>
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<tr>
<td>277</td>
<td>314</td>
<td>299</td>
<td>484</td>
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<td>344</td>
</tr>
<tr>
<td>326</td>
<td>314</td>
<td>254</td>
<td>349</td>
<td></td>
<td>311</td>
</tr>
<tr>
<td>Mean</td>
<td>280</td>
<td>314</td>
<td>352</td>
<td>397</td>
<td>336</td>
</tr>
</tbody>
</table>

**Crop:** Bajra (Kharif).

**Site:** Govt. Agri. Farm, Mandore.

**Ref:** Rj. 60(2), 61(18), 62(7).

**Object:** To find out the economic way of controlling weeds in Bajra.

1. **BASAL CONDITIONS:**
   (i) N.A. for 60(2), 61(18); Guar-Fallow-Bajra for 62(7). (b) Fallow for 60(2); Nil for 61(18); Guar for 62(7).
   (c) Nil. (ii) Sandy loam. (iii) July, 1960 for 60(2); 23.7.1961 for 61(18); 21.7.1962 for 62(7). (iv) (a) 1 to 4 ploughings. (b) N.A. (c) 5 to 7 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. (vi) Local for 60(2), 62(7); Sikar for 61(18). (vii) Unirrigated. (viii) and (ix) N.A. (x) Oct., 1960 for 60(2); 31.10.1961; 22.10.1962.

2. **TREATMENTS:**
   9 methods of controlling weeds: W₆ = Control (unweeded), W₇ = Local method of weeding, W₈ = Pre emergence application, W₉ = Post emergence application, W₁₀ = Post emergence application (once), W₁₁ = Pre-emergence application (twice), W₁₂ = Pre + Post emergence application (once), W₁₃ = Pre emergence + weeding (once), W₁₄ = Post emergence + weeding (once) and W₁₅ = Pre emergence + Post emergence application + weeding.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 7.3 m. x 5.5 m. (b) 5.5 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. **GENERAL:**
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960 to 1962. (b) No. (c) Nil. (v) Bassi and Tabiji. (vi) N.A. (vii) Since the error variances are heterogeneous and the interaction of Treatments with years is absent, therefore, individual years results are presented under 5. Results.

5. **RESULTS:**

**60(2)**
   (i) 127 Kg/ha. (ii) 52.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W₆</th>
<th>W₇</th>
<th>W₈</th>
<th>W₉</th>
<th>W₁₀</th>
<th>W₁₁</th>
<th>W₁₂</th>
<th>W₁₃</th>
<th>W₁₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av yield</td>
<td>141</td>
<td>162</td>
<td>92</td>
<td>205</td>
<td>120</td>
<td>99</td>
<td>113</td>
<td>95</td>
<td>120</td>
</tr>
</tbody>
</table>

**61(18)**
   (i) 344 Kg/ha. (ii) 201.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W₆</th>
<th>W₇</th>
<th>W₈</th>
<th>W₉</th>
<th>W₁₀</th>
<th>W₁₁</th>
<th>W₁₂</th>
<th>W₁₃</th>
<th>W₁₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av yield</td>
<td>393</td>
<td>371</td>
<td>215</td>
<td>368</td>
<td>363</td>
<td>314</td>
<td>420</td>
<td>406</td>
<td>247</td>
</tr>
</tbody>
</table>

**62(7)**
   (i) 962 Kg/ha. (ii) 276.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W₆</th>
<th>W₇</th>
<th>W₈</th>
<th>W₉</th>
<th>W₁₀</th>
<th>W₁₁</th>
<th>W₁₂</th>
<th>W₁₃</th>
<th>W₁₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av yield</td>
<td>1033</td>
<td>1204</td>
<td>1020</td>
<td>853</td>
<td>1008</td>
<td>823</td>
<td>853</td>
<td>1171</td>
<td>697</td>
</tr>
</tbody>
</table>
Crop: Bajra (Kharif).
Site: Govt. Agri. Farm, Mandore.

Object: To study the effect of fungicides in controlling the disease in Bajra.

1. BASAL CONDITIONS:

2. TREATMENTS:
   8 fungicidal treatments: T0 = Control, T1 = Agrosan G.N. at 4 gm., T2 = Ceresan at 3 gm., T3 = Tiller at 3 gm., T4 = Lunasan at 3 gm., T5 = Hervasan at 3 gm., T6 = Thiram at 4 gm., T7 = Beej powder No. 1 at 3 gm.
   Treatments given to per Kg. of seed as dressing.

3. DESIGN:
   (i) R.B.D. (ii) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 4.6 m x 2.7 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Incidence of green ear and smut disease control measures as per treatments. (iii) Yield of grain. (iv) (a) 1961 to 1963 (modified in 1963). (b) No. (c) Results of combined analysis are given under 5. (v) and (vi) N.A. (vii) Error variances are homogeneous, Treatments x years interaction is present.

5. RESULTS:
   (i) 1316 Kg/ha. (ii) 205.1 Kg/ha. (based on 7 d.f. made up of Treatments x years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
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<td></td>
<td>1474</td>
<td>1445</td>
<td>1194</td>
<td>1280</td>
<td>1223</td>
<td>1343</td>
<td>1430</td>
<td>1250</td>
</tr>
</tbody>
</table>

Crop: Bajra (Kharif).
Site: Govt. Agri. Farm, Mandore.

Object: To study the effect of fungicides in controlling green ear and smut diseases of Bajra.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy. (iii) 5 to 7.8.63. (iv) (a) 2 ploughings. (b) Dibbling. (c) 11 Kg/ha. (d) 30 cm x 23 cm. (e) 3. (v) N.A. (vi) Local chaffy. (vii) Unirrigated. (viii) 1 hand weeding. (ix) N.A. (x) 22, 23.10.63.

2. TREATMENTS:
   10 fungicidal treatments: T0 = Control, T1 = Agrosan G.N. at 4 gm., T2 = Ceresan at 3 gm., T3 = Tiller at 3 gm., T4 = Lunasan at 3 gm., T5 = Hervasan at 3 gm., T6 = Thiram at 4 gm., T7 = Shell seed dresser at 4 gm., T8 = Trotitan at 4 gm., T9 = Beej powder no. 1 at 3 gm.

3. DESIGN:
   (i) Incomplete L. sq. (ii) (a) 3 plots/block; 10 blocks/Sq and 3 sqs. (b) N.A. (iii) 9. (iv) (a) and (b) 4.6 m x 2.7 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Incidence of green ear and smut disease... (iii) No. of seeds germinated, No. of plants left after thinning, No. of plants counted just before harvesting. No. of plants affected by green ear disease, yield of grain and fodder. (iv) (a) 1961—53 (modified in 63). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Nil.
5. RESULTS:
(i) 49·3. (ii) 3·0 (iii) Treatment differences are not significant. (iv) Av. percentage of germination in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
</tr>
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<tbody>
<tr>
<td>Means degrees</td>
<td>47·89</td>
<td>49·45</td>
<td>51·69</td>
<td>47·34</td>
<td>49·87</td>
<td>48·16</td>
<td>50·50</td>
<td>48·51</td>
<td>50·30</td>
<td></td>
</tr>
</tbody>
</table>

Crop: Bajra (Kharif).

Site: Govt. Agri. Farm, Mandore.

Object: To study the effect of different doses and formulations of weedicides in the control of weeds in Bajra.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Fallow. (c) N.A. (ii) Sandy. (iii) July, 1960. (iv) (a) 4 ploughings. (b) N.A. (c) 23 kg/ha. (d) Row to row 30 cm. (e) N.A. (f) N.A. (g) Local. (h) Unirrigated. (i) and (ix) N.A. (x) Oct., 1960.

2. TREATMENTS:
Main-plot treatments:
4 types of weedicides: W₁ = Sodium salt of 2, 4-D, W₂ = Ethylester of 2, 4-D, W₃ = Amine salt of 2, 4-D, and W₄ = Sodium salt of M.C.P.A.

Sub-plot treatments:
5 doses of weedicides: D₀ = O, D₁ = 0·6, D₂ = 0·8, D₃ = 1·1 and D₄ = 1·4 Kg/ha. of acid equivalents.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/block; 5 sub-plots/main plot. (b) N.A. (iii) 4. (iv) 7·3 m × 5·5 m. (b) 5·5 m × 3·7 m. (v) 91 cm x 91 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960-N.A. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS:
(i) 89 Kg/ha. (ii) (a) 53·1 Kg/ha. (b) 40·8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>D₀</th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>W₁</td>
<td>92</td>
<td>77</td>
<td>85</td>
<td>120</td>
<td>120</td>
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<tr>
<td>W₂</td>
<td>85</td>
<td>85</td>
<td>56</td>
<td>85</td>
<td>71</td>
<td>76</td>
</tr>
<tr>
<td>W₃</td>
<td>92</td>
<td>92</td>
<td>85</td>
<td>92</td>
<td>127</td>
<td>98</td>
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<tr>
<td>W₄</td>
<td>77</td>
<td>120</td>
<td>85</td>
<td>71</td>
<td>71</td>
<td>85</td>
</tr>
<tr>
<td>Mean</td>
<td>87</td>
<td>94</td>
<td>78</td>
<td>92</td>
<td>97</td>
<td>89</td>
</tr>
</tbody>
</table>
1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Fallow. (c) N.A. (ii) Sandy loam. (iii) 22.7.61. (iv) (a) 2 ploughings. (b) N.A. (c) 9 Kg/ha. (d) Row to row 30 cm. (e) N.A. (vi) Siket. (vii) Unirrigated. (viii) to (ix) N.A. (x) 28.10.61.

2. TREATMENTS: and 3 DESIGN:
   Same as in expts. no. 61(9), 62(10) on page...

6. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960—N.A. (Design changed in 1961). (b) No. (c) Nil. (v) (a) Bassi, Tabiji and Durgapura. (b) Nil. (vi) and (vii) N.A.

5. RESULTS:
   (i) 686 Kg/ha. (ii) 513\frac{1}{2} Kg/ha. (iii) Main effect of D alone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>W_1</th>
<th>W_2</th>
<th>W_3</th>
<th>W_4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D_1</td>
<td>595</td>
<td>133</td>
<td>818</td>
<td>862</td>
<td>602</td>
</tr>
<tr>
<td>D_2</td>
<td>449</td>
<td>638</td>
<td>420</td>
<td>289</td>
<td>449</td>
</tr>
<tr>
<td>D_3</td>
<td>1176</td>
<td>1038</td>
<td>843</td>
<td>971</td>
<td>1007</td>
</tr>
<tr>
<td>Mean</td>
<td>740</td>
<td>603</td>
<td>694</td>
<td>707</td>
<td>686</td>
</tr>
</tbody>
</table>

C.D. for D marginal means 366-2 Kg/ha.

Crop :- Bajra (Kharif).
Site :- Govt. Agri. Farm, Tabiji.
Object :- To find out the economic way of controlling weeds in Bajra.

Ref :- 60(3), 61(2).
Type :- ‘D’.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Gram for 60(3); Barley for 61(2). (c) N.A. for 60(3); 44-8 Kg/ha of N+44-8 Kg/ha of P_2O_5. (ii) Sandy loam. (iii) 7.7.1960 ; 20.7.1961. (iv) (a) 3 to 5 ploughings. (b) N.A. (c) 6 Kg/ha. (d) 30 cm between rows. (e) N.A. (v) N.A. (vi) Local for 60(3); R.S.J. for 61(2). (vii) Unirrigated. (vii) and (ix) N.A. (x) 30.9.1960 ; Oct., 1961.

2. TREATMENTS:
   9 methods of controlling weeds: W_0=Control (unweeded), W_1=Local methods of weeding, W_2=Pre emergence application of weedicides, W_3=Post emergence application of weedicides (once), W_4=Post emergence (twice), W_5=Pre emergence +post emergence, W_6=Pre emergence +weeding, W_7=Post emergence +weeding and W_8=Pre emergence +Post emergence +weeding.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 7-3 m.*5-5 m. (b) 5-5 m.*3-7 m. (v) 91 cm.*91 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1959 to 1961. (b) No. (c) Results of combined analysis given under 5. (v) Bassi and Mandore. (vi) Nil. (vii) Results of Expt. no. 59(8) has also been included while giving combined results. Error variances are heterogeneous (Treatment x years) interaction is present.
5. **RESULTS:**

(i) 1107 Kg/ha, (ii) 376.6 Kg/ha, (based on 16 d.f. made up of treatments x years interaction). (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W₁</th>
<th>W₂</th>
<th>W₃</th>
<th>W₄</th>
<th>W₅</th>
<th>W₆</th>
<th>W₇</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>736</td>
<td>1500</td>
<td>850</td>
<td>964</td>
<td>1099</td>
<td>815</td>
<td>1018</td>
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<td>1452</td>
<td>1623</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.D.</td>
<td>325.8 Kg/ha.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

-Crop: Bajra (Kharif).
-Site: Govt. Agri. Farm, Tabiji.
-Ref: Rj. 60(7), 61(5), 62(12).
-Type: ‘D’.

Object: To study the effects of different doses and formulation of weedicides in the control of weeds.

1. **BASAL CONDITIONS:**

(i) (a) N.A. for 60(7), 61(5); Fallow-Wheat-Bajra for 62(12). (b) Gram for 60(7); Barley for 61(5); Wheat for 62(12). (c) Nil for 60(7); 44.8 Kg/ha. of N+44.8 Kg/ha. of P₂O₅. (ii) Sandy loam. (iii) 8.7.1960; 25.6.1961; 15.7.1962. (iv) (a) 3 to 5 ploughings. (b) N.A. (c) 6 Kg/ha. (d) 30 cm between rows. (e) N.A. (v) N.A. (vi) Local for 60(7); R.S.J. for others. (vii) Unirrigated. (viii) and (ix) N.A. (x) 29.9.1960; 10.10.1961; 1.11.1962.

2. **TREATMENTS and 3. DESIGN:**

Same as in Expts no. 61(9), 62(10) on page
Extra treatments are: E₀=Control and E₁=Weeding.
In exp. no. 60(7) the extra treatment is control (2 plots).

4. **GENERAL:**

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960 to 1962. (b) No. (c) Results of combined analysis given under 5. (v) and (vi) N.A. (vii) Expts. 61(5) and 62(12) have been pooled and their combined results presented below. Error variances are homogeneous and Treatments x years interaction is absent.

5. **RESULTS:**

**60(7)**

(i) 905 Kg/ha. (ii) 209.9 Kg/ha. (iii) Main effect of W is significant. Interaction D x W and ‘control vs. others’ are highly significant. (iv) Av. yield of grain in Kg/ha.

Control=546 Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>W₁</th>
<th>W₂</th>
<th>W₃</th>
<th>W₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>908</td>
<td>767</td>
<td>731</td>
<td>1138</td>
<td>886</td>
</tr>
<tr>
<td>D₂</td>
<td>972</td>
<td>1038</td>
<td>770</td>
<td>1021</td>
<td>950</td>
</tr>
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<td>D₃</td>
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<td>950</td>
<td>755</td>
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<tr>
<td>Mean</td>
<td>1017</td>
<td>1055</td>
<td>817</td>
<td>971</td>
<td>965</td>
</tr>
</tbody>
</table>

C.D. for W marginal means=173.4 Kg/ha.
C.D. for means in the body of D x W table=300.0 Kg/ha.
C.D. for ‘control vs. others’=161.7 Kg/ha.

**Combined results of 61(5), 62(12)**

(i) 1367 Kg/ha. (ii) 274.0 Kg/ha. (based on 91 d.f. made up of various components of treatments with years interaction and pooled error). (iii) Main effect of W and ‘extra treatments vs. others’ are significant. (iv) Av. yield of grain in Kg/ha.
Crop : Bajra (Kharif).

Site : Govt. Agri. Farm, Mandore.

Object :—To study the effect of fungicides in controlling the disease in two varieties of Bajra.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Fallow. (c) N.A. (ii) sandy. (iii) July, 1960. (iv) (a) 4 ploughings. (b) Dibbling.
   (c) N.A. (d) 30 cm. between rows. (c) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated.
   (viii) and (ix) N.A. (x) October, 1960.

2. TREATMENTS :
   Main-plot treatments :
   2 varieties : V1 = T5 and V2 = Local.
   Sub-plot treatments :
   8 fungicidal treatments : T0 = Control, T1 = Agrosan G.N. at 4 gm., T2 = Hervasan at 3 gm., T3 = Tillex.
   at 3 gm., T4 = Lunasan at 3 gm., T5 = Hervasan at 4 gm., T6 = Fervasan at 4 gm. and T7 = Sulphur at 6 gm.
   Treatments are applied to per Kg. of seed as dressing.

3. DESIGN :
   (i) Split-plot. (ii) (a) 2 main-plots/block ; 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 4·6 m. x 1·8 m. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960 only. (b) No. (c) Nil. (v) to (vii) N.A.

5. RESULTS :
   (i) 103 Kg/ha. (ii) (a) 28·1 Kg/ha. (b) 38·3 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<tr>
<th></th>
<th>V1</th>
<th>V2</th>
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</thead>
<tbody>
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</table>
Crop: Bajra (Kharif).

Site: Amer (Jaipur)(c.f.)

Object: To find out a suitable dose and time of dusting of Sodium salt of 2, 4-D for the control of striga in Bajra.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Barley. (c) N.A. (ii) Sandy. (iii) N.A. (iv) Local. (v) (a) 1 ploughing. (b) to (e) N.A. (vi) 5.7.1961. (vii) Unirrigated. (viii) and (ix) N.A. (x) 12.10.1961.

2. TREATMENTS:

   14 weedical treatments:
   
   1. Control, T1=2·2 Kg/ha. after 3 weeks of sowing, T2=2·2 Kg/ha. after 5 weeks of sowing, T3=3·4 Kg/ha. after 3 weeks of sowing, T4=3·4 Kg/ha. after 5 weeks of sowing, T5=4·5 Kg/ha. after 3 weeks of sowing, T6=4·5 Kg/ha. after emergence. T7=4·5 Kg/ha. after 5 weeks of sowing, T8=4·5 Kg/ha. after emergence. T9=2·2 Kg/ha. 3 and 5 weeks after emergence, T10=2·2 Kg/ha. 3 and 5 weeks after emergence. T11=2·2 Kg/ha. 3 and 5 weeks after sowing, T12=2·2 Kg/ha. after 3 weeks and after emergence and T13=2·2 Kg/ha. after 5 weeks and after emergence.

3. DESIGN:

   (i) R.B.D.; 14 plots/block and 4 replications. (ii) N.A. (iii) (a) N.A. (b) 4·6 m. x 1·8 m. (iv) Yes.

4. GENERAL:

   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) N.A. (b) and (c) Nil. (v) to (vii) Nil.

5. RESULTS:

   (i) 417 Kg/ha. (ii) 263·1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

   Treatment | T1 | T2 | T3 | T4 | T5 | T6
   Av. yield  | 324| 514| 445| 393| 375| 445

Crop: Maize (Kharif).

Site: Govt. Agri. Farm, Banswara.

Object: To study the effect of N, P and K on the yield of Maize.

1. BASAL CONDITIONS:

   (i) (a) to (c) N.A. (ii) N.A. (iii) 12.7.63. (iv) (a) and (b) N.A. (c) 18 Kg/ha. (d) 61 cm. x 30 cm. (e) N.A. (v) N.A. (vi) Hybrid. (vii) Irrigated. (viii) and (ix) N.A. (x) 27.10.61.

2. TREATMENTS:

   All combinations of (1), (2) and (3)
   
   (1) 3 levels of N as Ar/S.: N1=0, N2=67·3 and N3=134·5 Kg/ha.
   (2) 3 levels of P2O5 as super: P1=0, P2=44·3 and P3=89·7 Kg/ha.
   (3) 3 levels of K2O as Mur. Pot.: K1=0, K2=44·8 and K3=89·7 Kg/ha.

3. DESIGN:

   (i) 3 confd. (ii) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9·2 m. x 5·5 m. (b) 7·4 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.
4. GENERAL:
(i) Good. (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1963—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1670 Kg/ha. (ii) 107.2 Kg/ha. (iii) All the main effects and two factors interactions are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<tr>
<td>2169</td>
<td>2620</td>
<td>2246</td>
<td>1670</td>
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</tbody>
</table>

C.D. for N, P or K marginal means = 74.0 Kg/ha.
C.D. for means in the body of any table = 128.3 Kg/ha.

Crop: Maize (Kharif).
Site: Govt. Agri. Farm, Bassi.
Ref: Rj. 65(40).
Type: 'M'.

Object: To study the effect of N, P and K on the yield and uptake of nutrients by Maize.

2. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) 44.8 Kg/ha. of N. (ii) Sandy loam. (iii) 29.7.65. (iv) (a) Ploughing and planking. (b) N.A. (c) 17.9 Kg/ha. (d) 46 cm. x 61 cm. (e) N.A. (v) N.A. (vi) Maize B S. (vii) Irrigated. (viii) 4 weedings. (ix) N.A. (x) 27 to 29.10.65.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 4 levels of N as A/S: N0 = 0, N1 = 44.8, N2 = 89.7 and N3 = 134.5 Kg/ha.
(2) 3 levels of P2O5 as Super: P0 = 0, P1 = 44.8 and P2 = 89.7 Kg/ha.
(3) 3 levels of K2O as Mur. of Pot.: K0 = 0, K1 = 22.4 and K2 = 44.8 Kg/ha.

3. DESIGN:
(i) 4 x 3 x 3 confd. (ii) (a) 9 plots/block; 4 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 92 cm. x 5.5 m. (b) 74 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) Fair. (ii) Stem borer. (iii) Yield of grain and fodder. (iv) (a) 1964—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1546 Kg/ha. (ii) 395.8 Kg/ha. (iii) Main effect of K alone is significant. (iv) Av. yield of grain in Kg/ha.
Crop : Maize (Kharif).

Site :- Govt. Agri. Farm, Bassi.

Type :- 'M'.

Object :- To study the effect of different types of trace elements at different levels on the yield of Maize.

1. BASAL CONDITIONS:

   (i) (a) Nil for 61 (44); N.A. for others. (b) Fallow for 61 (44); Wheat for others. (c) Nil for 61 (44), 62 (21); G.M. for 63 (9). (ii) Sandy loam. (iii) 15.7.1:51; 27.7.U51; 17.7.1:53. (iv) (a) 3 to 5 ploughings. (b) N.A. (c) 18 to 22 Kg/ha. (d) 61 cm. x 15 cm. for 61 (44); 61 cm. x 45 cm. for others. (e) N.A. (v) Nil. (vi) Bassi selected. (vii) Unirrigated for 61 (44), 63 (9); Irrigated for 62 (21). (viii) 2 to 4 weedings. (ix) N.A. (x) 7.10.61; 23.10.62; 18, 19.10.63.

2. TREATMENTS:

   All combinations of (1) and (2) with 2 extra treatments

   (1) 3 levels of trace elements: \( L_1 = 5.6 \), \( L_2 = 11.2 \) and \( L_3 = 22.4 \) Kg/ha.

   (2) 5 trace elements: \( T_1 = \text{Cu. Sul.}, T_2 = \text{Zn. Sul.}, T_3 = \text{Boron}, T_4 = \text{Mn. Sul.}, \) and \( T_5 = \text{Fe. Sul.} \).

   All the (LT) combinations received 67.2 Kg/ha. of N as A'S + 33.6 Kg/ha. of P_2O_5 as super + 33.6 Kg/ha. of K_2O as Muri. Pot. as basal dressing.

   Extra treatments: \( E_0 = \text{No fertilizers (2 plots)} \) and \( E_1 = 67.2 \text{ Kg/ha. of N as A'S + 33.6 Kg/ha. of P_2O_5 as Super + 33.6 Kg/ha. of K_2O as Muri. Pot.} \). \( E_0 \) and \( E_1 \) were applied at the basal dressing.

   (iii) 9.2 m. x 5.5 m. for 61 (44) and 63 (9); 7.4 m. x 5.5 m. for 62 (21). (b) \( 7.4 \) m. x \( 3.7 \) for 61 (44) a and 63 (9); \( 6.5 \) m. x \( 2.7 \) for 62 (21). (v) 91 cm. x 91 cm. for 61 (44), 63 (9); 26 cm. x 137 cm. for 62 (21). (vi) Yes.

3. DESIGN:

   (i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 3. (iv) (a) 9.2 m. x 5.5 m. for 61 (44) and 63 (9); 7.4 m. x 5.5 m. for 62 (21). (b) \( 7.4 \) m. x \( 3.7 \) for 61 (44) a and 63 (9); \( 6.5 \) m. x \( 2.7 \) for 62 (21). (v) 91 cm. x 91 cm. for 61 (44), 63 (9); 26 cm. x 137 cm. for 62 (21). (vi) Yes.

4. GENERAL:

   (i) Growth was poor for 61 (44) and 62 (21); Good for 63 (9). (ii) Attack of stem borer for 61 (44), Endrin 20% was sprayed; N.A. for others. (iii) Yield of grain and fodder. (iv) 1951 to 1953, (b) N.A. (c) Nil. (v) N.A. (vi) Nil. (vii) Because the error variances are heterogeneous and Treatments x Years interaction is absent, results of individual years are presented under 5 Results.

5. RESULTS:

61(44)

   (i) 1522 Kg/ha. (ii) 268.6 Kg/ha. (iii) Main effect of T is significant. E effect and 'E vs. others' are highly significant. (iv) Av. yield of grain in Kg/ha.
Crop :- Maize (Kharif).

Site :- Govt. Agri. Farm, Bassi.

Object :- To study the effect of N, P and K at different levels alone and in combinations on the yield and quality of Maize.

Ref :- Rj. 61(117), 62(106), 63(10).

Type :- 'M'.
1. BASAL CONDITIONS:
(i) (a) Nil for 61 (117), 62 (105); N.A. for 63 (10). (b) Fallow for 61 (117); Wheat for 62 (106); Wheat+Zeera for 63 (10). (c) Nil for 61 (117), 62 (105); N.A. for 63 (10). (ii) Sandy loam. (iii) 11.7.61; 21.7.62; 17.7.63. (iv) (a) 2 to 3 ploughings. (b) N.A. (c) 18 to 20 Kglha. (d) 61 em. x 46 em. for 61 (117), 62 (106); N.A. for 63 (10). (e) N.A. (v) N.A. (vi) Bassi for 61 (117), 63 (10); Maize B.S. for 62 (106). (vii) Unirrigated for 61 (117), 62 (106); Irrigated for 63 (10). (viii) 2 to 3 weedicings. (ix) N.A. (lt) 6.10.61; 22.10.62. 18.10.63.

2. TREATMENTS:
All combination of (1), (2) and (3)
(1) 3 levels of N as A/S: N$_0$ =0, N$_1$ =50·4 and N$_2$ =100·9 Kgl/ha.
(2) 3 levels of P$_2$O$_5$ as Super: P$_0$ =0, P$_1$ =33·6 and P$_2$ =67·2 Kg/ha.
(3) 3 levels of K$_2$O as Mur. Pot.: K$_0$ =0, K$_1$ =33·6 and K$_2$ =67·2 Kg/ha.
P and K levels were tried in exp. no. 61 (117) at 0, 50 and 100 Kg/ha.

4. DESIGN:
(i) 3$^2$ Fact. confd. (ii) 9 plots/block; 3 blocks/replc.ation. (b) N.A. (iii) 1. (iv) (a) 9 2 m. x 5·5 m. (b) 7·4 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

5. RESULTS:
61(117)
(i) 800 Kg/ha. (ii) 291·9 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kgl/ha.

\[\begin{array}{ccc|ccc|c}
 & P_0 & P_1 & P_2 & K_0 & K_1 & K_2 & \text{Mean} \\
 N_0 & 107 & 301 & 251 & 295 & 136 & 229 & 220 \\
 N_1 & 726 & 1035 & 1164 & 892 & 956 & 1078 & 975 \\
 N_2 & 885 & 1482 & 1249 & 1424 & 1144 & 1048 & 1205 \\
 \text{Mean} & 573 & 939 & 888 & 870 & 745 & 785 & 800 \\
 K_0 & & & & 418 & 1115 & 1078 & \\
 K_1 & & & & 467 & 892 & 877 & \\
 K_2 & & & & 833 & 812 & 710 & \\
\end{array}\]

C.D. for N marginal means =33·1 Kgl/ha.

62(106)
(i) 1986 Kg/ha. (ii) 444·9 Kg/ha. (iii) Main effect of N is highly significant and that of P is significant. (iv) Av. yield of grain in Kgl/ha.

\[\begin{array}{ccc|ccc|c}
 & P_0 & P_1 & P_2 & K_0 & K_1 & K_2 & \text{Mean} \\
 N_0 & 885 & 1223 & 1157 & 920 & 1115 & 1230 & 1088 \\
 N_1 & 1509 & 2164 & 2574 & 1977 & 1905 & 2365 & 2082 \\
 N_2 & 2373 & 2969 & 3019 & 2797 & 2732 & 2833 & 2787 \\
 \text{Mean} & 1589 & 2119 & 2250 & 1898 & 1917 & 2143 & 1986 \\
 K_0 & & & & 1604 & 2085 & 2005 & \\
 K_1 & & & & 1345 & 2035 & 2372 & \\
 K_2 & & & & 1819 & 2237 & 2372 & \\
\end{array}\]

C.D. for N or P marginal means =513·1 Kgl/ha.
(i) 2445 Kg/ha. (ii) 147·0 Kg/ha. (iii) Main effect of N, P and interaction P \times K are highly significant. Interaction N \times P and N \times K are significant. (iv) Av. yield of grain in Kg/ha.

<table>
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<tr>
<th></th>
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<th>P₁</th>
<th>P₂</th>
<th>K₀</th>
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</table>

C.D. for N or P marginal means = 169·6 Kg/ha.
C.D. for means in the body of N \times P or N \times K or P \times K table = 293·8 Kg/ha.

---

Crop :- Maize (Kharif).
Site :- Govt. Agri. Res. Farm, Borekhera.
Ref. :- Rj. 60(78).
Type :- ‘M’.

Object :- To study the effect of different methods of application of sources and levels of N with and without P on the yield of Maize.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Fallow. (c) N.A. (ii) N.A. (iii) 7.7.1960. (iv) (a) 4 ploughings. (b) and (c) N.A. (d) 46 cm. between rows. (e) N.A. (v) N.A. (vi) Bassi (selected). (vii) Unirrigated. (viii) 2 weedicings. (ix) N.A. (x) 28.9.1960.

2. TREATMENTS:
Main-plot treatments:
3 levels of P₀: P₀ = 0. P₁ = 44·8 and P₂ = 89·7 Kg/ha.
Sub-plot treatments:
All combinations of (1), (2) and (3) with a control (No N)
(1) 2 levels of N: N₁ = 50·4 and N₂ = 100·9 Kg/ha.
(2) 2 sources of N: S₁ = A/S and S₂ = A/S/N.
(3) 2 methods of application of N: T₁ = Applied in 3 doses and T₂ = Applied in 2 doses.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication : 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10·5 m. \times 3·2 m. (b) 9·6 m. \times 2·3 m. (v) 45 cm. \times 45 cm. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Yield of grain. (iv) (a) 1960-1961 (experiment failed in 1961). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1380 Kg/ha. (ii) (a) 542·2 Kg/ha. (b) 528·5 Kg/ha. (iii) Main effect of N is significant and ‘control vs. others’ is highly significant. (iv) Av. yield of grain in Kg/ha.
Crop: Maize (Kharif).
Site: Govt. Agri. Farm, Dhakerkhedi.

Object: To study the effect of different methods of application of sources and levels of N with and without P on Maize.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) N.A. (iv) (a) 2 discings. (b) Line sowing. (c) N.A. (d) 46 cm. between rows. (e) -. (v) Nil. (vi) Basii (suitable). (vii) Unirrigated. (viii) 2 weedings. (ix) and (x) N.A.

2. TREATMENTS and 3. DESIGN:
   Same as in expt. no. 60 (78) on page 191.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Growth observations and yield of grain. (iv) (a) and (b) N. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1527 Kg/ha. (ii) (a) 232·2 Kg/ha. (b) 490·8 Kg/ha. (iii) Main effect of P and control vs. others are highly significant. Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

P₂N₄=700, P₁N₄=1156 and P₀N₄=1018 Kg/ha.

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C.D. for N marginal means =215·4 Kg/ha.
C.D. for 'control vs. rest' =322·6 Kg/ha.

Ref: Rj. 62(85).
Type: 'M'.
Crop :- Maize (Kharif).
Site :- Govt. Agri. Res. Farm, Sultanpur.

Object :- To study the effect of different methods of application, source and levels of N with and without P on Maize.

1. BASAL CONDITIONS :
(i) (a) Fallow-Maize. (b) Fallow. (c) Nil. (ii) N.A. (iii) 14.7.1963. (iv) (a) One ploughing, 2 bakherings and planking. (b) N.A. (c) 18 Kg./ha. (d) 46 cm. x 46 cm. (e) N.A. (v) N.A. (vi) Bassi (selected) (vii) Un-irrigated. (viii) 2 weedings. (ix) N.A. (x) 8.10.1963.

2. TREATMENTS and 3. DESIGN :
Same as in expt. no. 60(78) on page 191.

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

5. RESULTS :
(i) 1518 Kg/ha. (ii) (a) 213·0 Kg/ha. (b) 369·0 Kg/ha. (iii) Main effect of P and control vs other’s are highly significant. Main effect of N is significant. (iv) Av. yield of grain in Kg/ha.

Control=1259 kg/ha.

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C.D. for P marginal means=130·2 Kg/ha.
C.D. for N marginal means=150·3 Kg/ha.
C.D. for control vs. others=225·1 Kg/ha.

Crop :- Maize (Kharif).
Site :- Govt. Agri. Farm, Sumerpur.

Object :- To study the effect of different levels of phosphorus with different methods of placement on Maize yield and grain quality.

Ref :- Rj. 63(22).
Type :- ‘M’.

Ref :- Rj. 65(42).
Type :- ‘M’.
1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) 44·8 Kg/ha of N and 44·8 Kg/ha of P<sub>2</sub>O<sub>5</sub>. (ii) Sandy loam. (iii) 24·7.65. (iv) (a) Ploughing and planking. (b) Sowing behind the plough. (c) 12 Kg/ha. (d) 50 cm x 30 cm. (v) N.A. (vi) Bassi selected. (vii) Irrigated. (viii) 2 weedings. (ix) 46·4 cm. (x) 26.10.65.

2. TREATMENTS:

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

(1) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super:

P<sub>1</sub> = 33·6 Kg/ha; P<sub>2</sub> = 50·4 Kg/ha and P<sub>3</sub> = 67·2 Kg/ha.

(2) 3 methods of application:

M<sub>1</sub> = Broadcast, M<sub>2</sub> = Below the seed, and M<sub>3</sub> = Side hand placement.

P<sub>2</sub>O<sub>5</sub> applied at sowing.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 10·0 m. x 5·0 m. (b) 9·3 m. x 4·3 m. (v) 35 em. x 35 cm. (vi) Yes.

4. GENERAL:

(i) Fair. (ii) Attack of stemborer, 1·1 Kg in 897 litres/ha spray of 20% Elorin on 17.8.65. (iii) Height measurement and yield of grain. (iv) (a) 1965—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1204 Kg/ha. (ii) 292·3 Kg/ha. (iii) Main effect of P and interaction M x P are significant. (iv) Av. yield of grain in kg/ha.

Control = 965 Kg/ha.

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C. D. for P marginal means = 244·9 Kg/ha.

C. D. for body of M x P table = 423·9 Kg/ha.

Crop :- Maize (Kharif).

Site :- Govt. Agri. Farm, Tabiji.

Object :- To study the effect of different types of trace elements at different levels with the basal dose of N, P and K on the yield of Maize.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Barley. (c) Nil. (ii) Sandy loam. (iii) 21.7.62. (iv) (a) 5 ploughings. (b) N.A. (c) 17 Kg/ha. (d) 61 cm x 46 cm. (e) N.A. (v) N.A. (vi) Bassi selected. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 17.10.62.

2. TREATMENTS:

All combinations of (1) and (2) with 2 extra treatments

(1) 3 levels of micronutrients:

L<sub>1</sub> = CuS, L<sub>2</sub> = ZnSul., L<sub>3</sub> = Borax, L<sub>4</sub> = MnSul. and L<sub>5</sub> = FeSul.

2 Extra treatments:

E<sub>1</sub> = Control (2 plots) and E<sub>2</sub> = 67·3 Kg/ha of N as A/S as 33·6 Kg/ha of P<sub>2</sub>O<sub>5</sub> as Super as 33·6 Kg/ha of K<sub>2</sub>O as Mur. Pot. applied to all treatments except E<sub>2</sub> as basal dressing.

3. DESIGN:

(i) F.A.: 1 R 3 D. (ii) 'a' 11. (b) N.A. (iii) 3. (iv) (a) 9·2 m x 5·5 m. (b) 7·4 m x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

Ref :- Rj. 62(17).

Type :- 'M'.
4. GENERAL:
(i) N.A. (ii) Attack of stem borer. (iii) Yield of grain and fodder. (iv) (a) 1962 only. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 2752 Kg/ha. (ii) 414.2 Kg/ha. (iii) E effect and 'E vs others, are highly significant. (iv) Av. yield of grain in Kg/ha.

\[ E_0 = 1584 \text{ Kg/ha} \text{ and } E_1 = 2503 \text{ Kg/ha.} \]

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C. D. for E means = 686.5 Kg/ha.
C. D. for 'E vs. others' = 307.5 Kg/ha.

Crop :: Maize (Kharif).
Site :: Govt. Agri. Farm, Tabiji.
Object :: To study the effect of different levels and sources of N on Maize.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Wheat. (c) Nil. (ii) Sandy loam. (iii) 9.7.60. (iv) (a) 3 ploughings. (b) N.A. (c) 17 Kg/ha. (d) 61 cm. x 15 cm to 23 cm. (e) N.A. (v) N.A. (vi) Bassi (selection). (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 7.10.1960.

2. TREATMENTS:
All combinations of (1) and (2) with a control (no manure).
(1) 2 levels of N: N_1 = 33.6 and N_2 = 67.2 Kg/ha.
(2) 3 sources of N: S_1 = T.C, S_2 = F.Y.M. and S_3 = A/S.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 9’2 m. x 5’5 m. (b) 7’4 m. x 3’7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Effect of stem borer. (iii) Yield of grain and fodder. (iv) (a) 1960—1962 (modified in 1961). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2052 Kg/ha. (ii) 229’9 Kg/ha. (iii) Main effect of S alone is highly significant. (iv) Av. yield of grain in Kg/ha.

Control = 1982 Kg/ha.

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C. D. for S marginal means = 241.4 Kg/ha.

Ref :: Rj. 60(36).
Type :: ‘M’.
Crop :- Maize (Kharif).
Site :- Govt. Agri. Farm, Tabiji.

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

1. BASAL CONDITIONS:
(i) (a) Nil for 61(42); Maize-Wheat for 62(24). (b) Wheat. (c) Nil. (ii) Sandy loam. (iii) 9.7.1961; 13.7.1962. (iv) (a) 4 ploughings. (b) N.A. (c) 17 Kg/ha. (d) 61 cm. x 46 cm. (e) N.A. (v) N.A. (vi) Bassi selected. (vii) Irrigated. (viii) 2 to 3 weedings. (ix) N.A. (x) 7.10.1961; 15.10.1962.

2. TREATMENTS:
All combinations of (1) and (2) with a control
(1) 3 sources of N: S₁=T.C., S₂=F.Y.M. and S₃=AJS.
(2) 2 levels of N: N₁=50.4 and N₂=100.9 Kg/ha.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 7. (b) N.A. (iii) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 em. x 91 cm. (vi) Yes.

4. GENERAL:
(i) Poor growth in few plots due to poor soil fertility for 61(42); N.A. for other. (ii) Slight attack of stem borer, control measures N.A. (iii) Yield of grain and fodder. (iv) (a) 1960-1962 (treatments levels changed in 61). (b) N.A. (c) Results of combined analysis are given under 5. (v) and (vi) N.A. (vii) Error variances are homogeneous and Treatments x years interaction is present.

5. RESULTS:
(i) 1469 Kg/ha. (ii) 733.0 Kg/ha. (based on 6 df. made up of Treatments x years interaction). (iii) Main effect of S alone is insignificant. (iv) Av. yield of grain in Kg/ha.

Control=1318 Kg/ha.

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C.D. for S marginal means=634.0 Kg/ha.
3. **DESIGN:**

(i) Strip-plot. (ii) (a) 2 plots in one direction and 9 plots in perpendicular direction. (b) N.A. (iii) 3.

(iv) (a) 9·2 m. x 5'5 m. (b) 7·4 m. x 3'7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. **GENERAL:**

(i) N.A. for 60(35), 62(20); Poor growth in few plots due to poor soil fertility for 61(43). (ii) Slight attack of stem borer. (iii) Yield of grain. (iv) (a) 1950 to 1962. (b) No. (c) Nil. (d) Nil. (e) Nil. (f) Since the sub-plot error variances are heterogeneous results of individual years are presented under 5. Results.

5. **RESULTS:**

60(35)

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C.D. for M means at the same level of K=1334·1 Kg/ha.
C.D. for K means at the same level of M = 346·2 Kg/ha.

61(43)

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C.D. for N marginal means=613·1 Kg/ha.

62(20)

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C.D. for N marginal means=613·1 Kg/ha.
Crop :- Maize (Kharif).

Site :- Govt. Agri. Farm, Tabiji.

Object :- To study the effect of different levels of N, P and K alone and in combination on the yield of Maize.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat for 61(37); Barley for 62(28). (c) Nil. (ii) Sandy loam. (iii) 8.7.1961 ; 14.7.1962. (iv) (a) 4 to 5 ploughings. (b) N.A. (c) 17 Kg/ha. (d) 61 cm. x 46 cm. (e) N.A. (v) N.A. (vi) Bassi (selected). (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 8.10.1961 ; 16.10.1962.

2. TREATMENTS :
   All combinations of (1), (2) and (3)
   (1) 3 levels of N : \( N_0 = 0, N_1 = 33.6 \) and \( N_2 = 67.2 \) Kg/ha.
   (2) 3 levels of \( P_0 \) : \( P_0 = 0, P_1 = 33.6 \) and \( P_2 = 67.2 \) Kg/ha.
   (3) 3 levels of \( K_0 \) : \( K_0 = 0, K_1 = 33.6 \) and \( K_2 = 67.2 \) Kg/ha.

3. DESIGN :
   (i) 3\(^2\) Fact. confd. (ii) (a) 9 plots/block ; 3 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Stem borer attack, control measures N.A. (iii) Yield of grain and fodder. (iv) (a) 1961 to 1962. (b) No. (c) Results of combined analysis given under 5. (v) to (vi) Nil. (vii) Error variances are homogeneous, Treatments x years interaction is absent.

5. RESULTS :
   (i) 1810 Kg/ha. (ii) 506.9 Kg/ha. (based on 18 d.f. made up of various components of Treatments x years interaction). (iii) Main effect of N alone is highly significant. (iv) Av. yield of grain in Kg/ha.
Crop: Maize (Kharif).
Site: Rj. College of Agri. Udaipur.
Object: To study the effect of different levels of N, P and K alone and in combinations on the yield of Maize.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) N.A.
   (ii) Sandy loam.
   (iii) 23.5.64.
   (iv) (a) Ploughed with the soil inverting plough and disc harrow. (b) Drilling. (c) 25 Kg/ha. (d) 45 cm × 25 to 35 cm. (e) N.A. (v) N.A. (vi) Malan. (vii) Irrigated. (viii) and (ix) N.A. (x) 3.10.61.

2. TREATMENTS:
   All combinations of (1), (2) and (3) with one control
   (1) 5 levels of N: N₁=49.4, N₂=98.8, N₃=148.3, N₄=197.7 and N₅=247.1 Kg/ha.
   (2) 4 levels of P₂O₅: P₀=0, P₁=37.1 P₂=61.8 and P₃=86.5 Kg/ha.
   (3) 3 levels of K₂O: K₀=0, K₁=61.8 and K₂=86.5 Kg/ha.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 61. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 8.0 m × 4.5 m. (c) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) 1964 only. (c) Nil. (v) (vii) Nil.

5. RESULTS:
   (i) 2270 Kg/ha. (ii) 1690 Kg/ha. (iii) Main effect of N, P and 'control vs. others' are significant. (iv) Av. yield of grain in Kg/ha.

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<td>2047</td>
<td>2239</td>
<td>2173</td>
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<tr>
<td>Mean</td>
<td>2405</td>
<td>2293</td>
<td>2172</td>
<td>2290</td>
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C.D. for N marginal means=354.8 Kg/ha.
Crop: Maize (Kharif).
Site: Vidhya Bhavan Rural Ins. Farm, Udaipur.

Object: To study the effect of different levels of N, P, K alone and in combinations on the yield of Maize.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) Fallow.  (c) Nil.  (ii) Sandy loam.  (iii) 13.7.63.  (iv) (a) and (b) N.A.  (c) 13 Kg/ha.
   (d) 61 cm. x 30 cm.  (v) N.A.  (vi) Hybrid.  (vii) Unirrigated.  (viii) and (ix) N.A.  (x) 7.11.63.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 4 levels of N as A/S: N₀ = 0, N₁ = 67.3, N₂ = 134.5 and N₃ = 201.8 Kg/ha.
   (2) 3 levels of P₁₀ as Super: P₁₀ = 0, P₁ = 33.6 and P₁₀ = 67.3 Kg/ha.
   (4) 2 levels of K₂₀ as Mur. Pot.: K₀ = 0 and K₁ = 44.8 Kg/ha.

3. DESIGN:
   (i) 4 x 3 x 2 Fact. confd.  (ii) 12 plots/block, 2 blocks/replication.  (b) N.A.  (iii) 3.  (iv) (a) 9'2 m. x 5'5 m.
   (b) 7'4 m. x 3'7 m.  (v) 91 cm. x 91 cm.  (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A.  (iii) Yield of grain and fodder.  (iv) (a) 1963—contd.  (b) No.  (c) Nil.  (v) to (viii) Nil.

5. RESULTS:
   (i) 1497 Kg/ha.  (ii) 104.0 Kg/ha.  (iii) All the main effects and two factors interactions are highly significant.  (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
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<th>K₀</th>
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</tr>
</tbody>
</table>

C.D. for N marginal mean = 97.6 Kg/ha.
C.D. for P marginal mean = 87.1 Kg/ha.
C.D. for K marginal mean = 49.4 Kg/ha.
C.D. for means in the body of N x P table = 121.3 Kg/ha.
C.D. for means in the body of N x K table = 99.0 Kg/ha.
C.D. for means in the body of P x K table = 85.6 Kg/ha.
Crop: Maize (Kharif).

Ref: Rj. 63(23).

Site: Govt. Agri. College Farm, Udaipur.

Type: 'M'.

Object: To study the effect of different levels of N, P and K on the yield of Maize.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) Nil. (ii) Clay loam. (iii) 22, 23.7.62. (iv) (a) and (b) N.A. (c) 17 Kg/ha. (d) 61 cm. x 30 cm. (e) N.A. (v) Nil. (vi) Malan. (vii) Unirrigated. (viii) and (ix) N.A. (x) 3.11.62.

2. TREATMENTS:
8 manurial treatments:
- M₀ = Control.
- M₁ = 44·8 Kg/ha.
- P₀ = Super as 44·8 Kg/ha.
- M₂ = M₁ + 22·4 Kg/ha.
- M₃ = M₁ + 67·3 Kg/ha.
- M₄ = M₁ + 112·1 Kg/ha.
- M₅ = M₁ + 134·5 Kg/ha.
- M₆ = M₁ + 134·5 Kg/ha.
- M₇ = M₁ + 134·5 Kg/ha.

3. DESIGN:
(i) R.B.D. (ii) 8. (iii) 5. (iv) 9·2 m. x 5·5 m. (v) 7·4 m. x 3·7 m. (vi) 91 cm. x 91 cm. (vii) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) to (vii) N.A.

5. RESULTS:
(i) 1768 Kg/ha. (ii) 310 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
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<td>Av. yield</td>
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<td>1653</td>
<td>1912</td>
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<td>1698</td>
<td>1827</td>
<td>1816</td>
</tr>
</tbody>
</table>

Crop: Maize (Kharif).

Ref: Rj. 60, 61, 62, 63, 64(M.A.E).

Site: M.A.E. Centre, Sriganganagar.

Type: 'M'.

Object: Type II — To study the residual effects of different levels of N, P, K and FYM on the yield of Maize.

1. BASAL CONDITIONS:
(i) (a) Maize-Wheat-Tightsenji. (b) Senji. (c) N.A. (ii) Sandy loam. (iii) N.A., 20.6.61, N.A., 30.6.63 and 12.6.64. (iv) (a) 1 ploughing and Cross discing by tractor. (b) Drilling in lines. (c) 27·7 Kg/ha. (d) 46 cm. between rows. (e) Nil. (v) N.A. (vi) Bassi (for 61, 63), Local for 64, N.A. for others. (vii) Irrigated. (viii) Hoeing and weeding. (ix) Nil. (x) N.A., 24 to 26.9.61, N.A., 3.10.63 and 12.9.64.

2. TREATMENTS:
- All combinations of (1), (2), (3) and (4)
  (1) 2 levels of FYM: F₀ = 0 and F₁ = 5600 Kg/ha.
  (2) 3 levels of N as A/S: N₀ = 0, N₁ = 22·4 and N₂ = 44·8 Kg/ha.
  (3) 3 levels of N as A/S: N₀ = 0, N₁ = 22·4 and N₂ = 44·8 Kg/ha.
  (4) 3 levels of K₂O as Mur. Pot.: K₀ = 0, K₁ = 22·4 and K₂ = 44·8 Kg/ha.

3. DESIGN:
(i) 3² x 2 Fact. confd. (ii) (a) 9 plots/block and 6 blocks/replication. (3 blocks receiving F₀ and 3 blocks receiving F₁ treatment). (iii) 1. (iv) (a) 10·1 m. x 5·0 m. (b) 8·8 m. x 4·1 m. (v) 61 cm. x 46 cm. (vi) Yes.
4. GENERAL:

(i) Good. (ii) Attack of birds. (iii) Grain yield. (iv) (a) 1957 to 64. (b) and (c) N.A. (v) and (vi) N.A. 
(vii) Error variances are heterogeneous and Treatments x years interaction is absent. Results of individual 
years are presented under 5 Results.

5. RESULTS:

Rj. 60(M.A.E.)

(i) 1207 Kg/ha. (ii) 24'0 Kg/ha. (iii) Main effect of N and interaction N X P and F X N are significant. (iv) 
Av. yield of grain in Kg/ha.

<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>
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</tbody>
</table>

C.D. for N marginal means = 171·3 Kg/ha.
C.D. for means in the body of F X N table = 242·2 Kg/ha.
C.D. for means in the body of N X P table = 296·7 Kg/ha.

61(M.A.E.)

(i) 344 Kg/ha. (ii) 161'9 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<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>
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<td>350</td>
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<td>P₂</td>
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<td>406</td>
<td>423</td>
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<td></td>
<td></td>
<td>332</td>
<td>406</td>
<td>423</td>
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</tbody>
</table>

62(M.A.E.)

(i) 306 Kg/ha. (ii) 88'0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
63 (M.A.E.)

(i) 531 Kg/ha.  (ii) 58.1 Kg/ha.  (iii) Main effect of N is highly significant. Interaction N x K and F x N are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>F₀</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>
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Mean

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<tr>
<td>K₂</td>
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<td>289</td>
<td>270</td>
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</tbody>
</table>

P₀  292  304  316
P₁  280  305  309
P₂  352  321  275

64 (M.A.E.)

(i) 644 Kg/ha.  (ii) 221.9 Kg/ha.  (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>F₀</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>K₀</th>
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Mean

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<td>568</td>
<td>599</td>
</tr>
<tr>
<td>K₂</td>
<td>545</td>
<td>553</td>
<td>545</td>
</tr>
</tbody>
</table>

P₀  493  542  536
P₁  456  562  551
P₂  482  585  573

C.D. for N marginal means = 40.0 Kg/ha.
C.D. for means in the body of F x N table = 36.6 Kg/ha.
C.D. for means in the body of N x K table = 69.1 Kg/ha.

64 (M.A.E.)

(i) 644 Kg/ha.  (ii) 221.9 Kg/ha.  (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.
Crop: Maize.  
Ref: Rj. 62, 63 (S.F.T.).

Site: (District): Banswara.  
Type: ‘M’.

Object: To study the response curves of important cereal, cash, and oilseed crops to nitrogen applied singly and in combination with other nutrients (Type: A).

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  
(ii) Red and yellow; Grey brown.  
(iii) to (vi) N.A.  
(vii) Unirrigated.  
(viii) to (x) N.A.

2. TREATMENTS:
8 manurial treatments
- O = Control (no manure).
- N = 33.6 Kg/ha. of N.
- P = 33.6 Kg/ha. of P₂O₅.
- N₁P₁ = 33.6 Kg/ha. of N + 33.6 Kg/ha. of P₂O₅.
- N₂P₁ = 67.2 Kg/ha. of N + 33.6 Kg/ha. of P₂O₅.
- N₆P₁ = 67.2 Kg/ha. of N + 67.2 Kg/ha. of P₂O₅.
- N₆P₁K₁ = 67.2 Kg/ha. of N + 67.2 Kg/ha. of P₂O₅ + 33.6 Kg/ha. of K₂O.

N applied as A/S; P₂O₅ as Super and K₂O as Mur. Pot.

3. DESIGN:
A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern, etc. In each zone one block is selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A, 11 of type A₂, 11 of type A₃, and 3 are of type C. The eleven experiments under type A, A₂, and A₃ are distributed as 3 on a kharif cereal, 3 on a rabi cereal, 3 on a cash crop and 2 on oilseed. All the three type-C experiments are conducted on a legume crop. For the purpose of conducting the A, A₂, and A₃ experiments, 11 villages are randomly selected in each block and in each village 3 experiments each of type A, A₂, and A₃ are laid out. For conducting the three type-C trials, three villages are randomly selected in each block.

4. GENERAL:
(i) to (iii) N.A.  
(b) and (c) N.A.  
(v) to (vii) N.A.

5. RESULTS:

62 (S.F.T.)
Treatment N₁ N₂ P₁ N₁P₁ N₂P₁ N₆P₁ N₆P₁K₁ S.E.
Av. response of grain in Kg/ha. 190 306 133 282 664 375 554 1310

Control yield = 812 Kg/ha.; No. of trials = 2.

63 (S.F.T.)
Treatment N₁ N₂ P₁ N₁P₁ N₂P₁ N₆P₁ N₆P₁K₁ S.E.
Av. response of grain in Kg/ha. 133 127 94 160 198 230 233 429

Control yield = 382 Kg/ha.; No. of trials = 3.

Crop: Maize (Kharif).

Site: (District): Banswara.

Object: To study the response curves of important cereal, cash, and oilseed crops to nitrogen applied singly and in combination with other nutrients (Type: A₃).

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  
(ii) Red and yellow; Grey brown.  
(iii) to (vi) N.A.  
(vii) Unirrigated.  
(viii) to (x) N.A.
2. TREATMENTS:
8 manurial treatments
O = Control (no manure)
N₁ = 33.6 Kg/ha. of N
N₂ = 67.2 Kg/ha. of N
P₁ = 33.6 Kg/ha. of P₂O₅
N₁P₁ = 33.6 Kg/ha. of N + 33.6 Kg/ha. of P₂O₅
N₂P₁ = 67.2 Kg/ha. of N + 33.6 Kg/ha. of P₂O₅
N₁P₂ = 33.6 Kg/ha. of N + 67.2 Kg/ha. of P₂O₅
N₁P₂K₁ = 67.2 Kg/ha. of N + 67.2 Kg/ha. of P₂O₅ + 33.6 Kg/ha. of K₂O
N applied as A/S, P₂O₅ as Super and K₂O as Mur. of Pot.

3. DESIGN:
Same as in type A₁ (Irrigated) on page 204.

4. GENERAL:
(i) to (iii) N.A. (iv) (a) 1962 to 1966 for Banswara and 1962 to 1965 for Pali. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:
Banswara
62 (S.F.T.)
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<tr>
<th>Treatment</th>
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<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₂K₁</th>
<th>S.E.</th>
<th>Av. response of grain in Kg/ha.</th>
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<td>879</td>
<td>859</td>
<td>1201</td>
</tr>
<tr>
<td>Control</td>
<td>903</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Yield</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of trials</td>
<td>7.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

63 (S.F.T.)
<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₂K₁</th>
<th>S.E.</th>
<th>Av. response of grain in Kg/ha.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>131</td>
<td>419</td>
<td>170</td>
<td>296</td>
<td>474</td>
<td>616</td>
<td>673</td>
<td>952</td>
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<tr>
<td>Control</td>
<td>737</td>
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<tr>
<td>Yield</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No. of trials</td>
<td>7.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

64 (S.F.T.)
<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₂K₁</th>
<th>S.E.</th>
<th>Av. response of grain in Kg/ha.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>523</td>
<td>783</td>
<td>167</td>
<td>959</td>
<td>976</td>
<td>1307</td>
<td>1464</td>
<td>944</td>
</tr>
<tr>
<td>Control</td>
<td>806</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Yield</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of trials</td>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

65 (S.F.T.)
<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₂K₁</th>
<th>S.E.</th>
<th>Av. response of grain in Kg/ha.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>266</td>
<td>470</td>
<td>116</td>
<td>520</td>
<td>656</td>
<td>822</td>
<td>908</td>
<td>778</td>
</tr>
<tr>
<td>Control</td>
<td>602</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yield</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of trials</td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>

Pali
63 (S.F.T.)
<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₂K₁</th>
<th>S.E.</th>
<th>Av. response of grain in Kg/ha.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>63</td>
<td>11</td>
<td>92</td>
<td>120</td>
<td>155</td>
<td>242</td>
<td>422</td>
</tr>
<tr>
<td>Control</td>
<td>1231</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yield</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of trials</td>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Crop:** Maize (*Kharif*).

**Site:** (District): Pali.

**Object:** To study response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients (Type: A<sub>3</sub>).

1. **BASAL CONDITIONS:**
   (i) N.A. (ii) Grey brown (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. **TREATMENTS:**
   8 manurial treatments
   - O = Control (no manure)
   - \( N_i = 33.6 \) Kg/ha. of \( N \)
   - \( K_i = 33.6 \) Kg/ha. of \( K \)
   - \( N_iK_i = 33.6 \) Kg/ha. of \( N + 33.6 \) Kg/ha. of \( K \)
   - \( N_iK_i = 67.2 \) Kg/ha. of \( N + 67.2 \) Kg/ha. of \( K \)
   - \( N_iK_i = 67.2 \) Kg/ha. of \( N + 67.2 \) Kg/ha. of \( K \)
   - \( N_iK_i = 33.6 \) Kg/ha. of \( N + 33.6 \) Kg/ha. of \( K \)
   - \( N_iK_i = 33.6 \) Kg/ha. of \( N + 33.6 \) Kg/ha. of \( K \)
   - \( N_iK_i = 33.6 \) Kg/ha. of \( N + 33.6 \) Kg/ha. of \( K \)
   - N applied as A/S, P<sub>2</sub>O<sub>5</sub> as Super and K<sub>2</sub>O as Mur. of Pot.

3. **DESIGN:**
   Same as in type A<sub>3</sub>(Irrigated) on page 204.

4. **GENERAL:**
   (i) to (iii) N.A. (iv) (a) 1962 and 1963. (b) and (c) N.A. (v) to (vii) N.A.

5. **RESULTS:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>S.E.</th>
<th>208</th>
<th>133</th>
<th>109</th>
<th>294</th>
<th>127</th>
<th>466</th>
<th>317</th>
<th>122.5</th>
</tr>
</thead>
</table>

Control yield = 985 Kg/ha; No. of trials = 2.

---

**Crop:** Maize (*Kharif*).

**Site:** (District): Pali.

**Object:** To study response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients (Type: A<sub>3</sub>).

1. **BASAL CONDITIONS:**
   (i) N.A. (ii) Grey brown (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. **TREATMENTS:**
   8 manurial treatments
   - O = Control (no manure)
   - \( N_i = 33.6 \) Kg/ha. of \( N \)
   - \( K_i = 33.6 \) Kg/ha. of \( K \)
   - \( N_iK_i = 33.6 \) Kg/ha. of \( N + 33.6 \) Kg/ha. of \( K \)
   - \( N_iK_i = 67.2 \) Kg/ha. of \( N + 67.2 \) Kg/ha. of \( K \)
   - \( N_iK_i = 33.6 \) Kg/ha. of \( N + 33.6 \) Kg/ha. of \( K \)
   - \( N_iK_i = 33.6 \) Kg/ha. of \( N + 33.6 \) Kg/ha. of \( K \)
   - \( N_iK_i = 33.6 \) Kg/ha. of \( N + 33.6 \) Kg/ha. of \( K \)
   - N applied as A/S, P<sub>2</sub>O<sub>5</sub> as Super and K<sub>2</sub>O as Mur. of Pot.

3. **DESIGN:**
   Same as in type A<sub>3</sub>(Irrigated) on page 204.

4. **GENERAL:**
   (i) to (iii) N.A. (iv) (a) 1962 and 1963. (b) and (c) N.A. (v) to (vii) N.A.

5. **RESULTS:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>S.E.</th>
<th>208</th>
<th>133</th>
<th>109</th>
<th>294</th>
<th>127</th>
<th>466</th>
<th>317</th>
<th>122.5</th>
</tr>
</thead>
</table>

Control yield = 985 Kg/ha; No. of trials = 2.
Crop: Maize (Kharif).
Ref: Rj. 62, 63, 64, 65(S.F.T.) for Banswara and 63, 64, 65(S.F.T.) for Pali.
Site: (District) Banswara and Pali.
Type: 'M'.

Object: To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients (Type: A3).

1. BASAL CONDITIONS:
   (i) N.A. (ii) Red and yellow; Grey brown. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   8 manurial treatments
   O = Control (no manure).
   N1 = 33.6 Kg/ha. of N.
   K1 = 33.6 Kg/ha. of K20.
   K2 = 67.2 Kg/ha. of K20.
   N1K1 = 33.6 Kg/ha. of N + 33.6 Kg/ha. of K20.
   N1K2 = 33.6 Kg/ha. of N + 67.2 Kg/ha. of K20.
   N2K1 = 67.2 Kg/ha. of N + 33.6 Kg/ha. of K20.
   N2K2 = 67.2 Kg/ha. of N + 67.2 Kg/ha. of K20.
   N1P1K1 = 3.6 Kg/ha. of N + 33.6 Kg/ha. of P2O5 + 33.6 Kg/ha. of K2O.
   N applied as A/S, P2O5 as Super and K2O as Mur. of Pot.

3. DESIGN:
   Same as in type A1 (Irrigated) on page 204.

4. GENERAL:
   (i) to (iii) N.A. (iv) (a) 1952 to 1966 for Banswara and 1963 to 1966 for Pali. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

Banswara
62(S.F.T.)
Treatment

<table>
<thead>
<tr>
<th>Av. response of grain in Kg/ha.</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N2K1</th>
<th>N2K2</th>
<th>N1P1K1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>98</td>
<td>-50</td>
<td>-1</td>
<td>327</td>
<td>327</td>
<td>513</td>
<td>411</td>
<td>118'3</td>
</tr>
</tbody>
</table>

Control yield = 700 Kg/ha.; No. of trials = 9.

63(S.F.T.)
Treatment

<table>
<thead>
<tr>
<th>Av. response of grain in Kg/ha.</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N2K1</th>
<th>N2K2</th>
<th>N1P1K1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>251</td>
<td>34</td>
<td>37</td>
<td>270</td>
<td>277</td>
<td>509</td>
<td>350</td>
<td>72'6</td>
</tr>
</tbody>
</table>

Control yield = 610 Kg/ha.; No. of trials = 9.

64 (S.F.T.)
Treatment

<table>
<thead>
<tr>
<th>Av. response of grain in Kg/ha.</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N2K1</th>
<th>N2K2</th>
<th>N1P1K1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>555</td>
<td>74</td>
<td>114</td>
<td>542</td>
<td>688</td>
<td>868</td>
<td>1038</td>
<td>87'9</td>
</tr>
</tbody>
</table>

Control yield = 733 Kg/ha.; No. of trials = 7.

65 (S.F.T.)
Treatment

<table>
<thead>
<tr>
<th>Av. response of grain in Kg/ha.</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N2K1</th>
<th>N2K2</th>
<th>N1P1K1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>268</td>
<td>42</td>
<td>102</td>
<td>336</td>
<td>434</td>
<td>656</td>
<td>678</td>
<td>65'8</td>
</tr>
</tbody>
</table>

Control yield = 556 Kg/ha.; No. of trials = 5.

Pali
63(S.F.T.)
Treatment

<table>
<thead>
<tr>
<th>Av. response of grain in Kg/ha.</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N2K1</th>
<th>N2K2</th>
<th>N1P1K1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>63</td>
<td>89</td>
<td>127</td>
<td>172</td>
<td>29'1</td>
</tr>
</tbody>
</table>

Control yield = 1221 Kg/ha.; No. of trials = 2.
**Crop:** Maize.

**Object:** To study the response of Maize to levels of N, P and K applied individually and in combination. (Type: A).

### 1. BASAL CONDITIONS:

(i) N.A.  (ii) As per results.  (iii) to (x) N.A.

### 2. TREATMENTS:

- **O = Control (no manure)**
  - \( n = 22.4 \text{ Kg/ha. of } N \text{ as A/S} \)
  - \( p = 22.4 \text{ Kg/ha. of } P_2O_5 \text{ as Super} \)
  - \( k = 22.4 \text{ Kg/ha. of } K_2O \text{ as Mur. Pot.} \)
  - \( np = 22.4 \text{ Kg/ha. of } N \text{ as A/S} + 22.4 \text{ Kg/ha. of } P_2O_5 \text{ as Super} \)
  - \( nk = 22.4 \text{ Kg/ha. of } N \text{ as A/S} + 22.4 \text{ Kg/ha. of } K_2O \text{ as Mur. Pot.} \)
  - \( pk = 22.4 \text{ Kg/ha. of } P_2O_5 \text{ as Super} + 22.4 \text{ Kg/ha. of } K_2O \text{ as Mur. Pot.} \)
  - \( npk = 22.4 \text{ Kg/ha. of } N \text{ as A/S} + 22.4 \text{ Kg/ha. of } P_2O_5 \text{ as Super} + 22.4 \text{ Kg/ha. of } K_2O \text{ as Mur. Pot.} \)

- N applied as A/S; \( P_2O_5 \text{ as Super and } K_2O \text{ as Mur. of Pot.} \)

### 3. DESIGN:

(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year on kharif cereal, 8 on a rabi cereal, 8 on a cash crop, 4 on an oilseed crop and 3 on a legume crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of Type C. Residual effects of phosphate application are studied on Type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/98.8 ha.  (b) 1/197.7 ha.  (iv) Yes.

### 4. GENERAL:

(i) to (vii) N.A.

### 5. RESULTS:

<table>
<thead>
<tr>
<th>District</th>
<th>Soil class</th>
<th>No. of trials</th>
<th>Control N</th>
<th>P</th>
<th>K</th>
<th>S.E.</th>
<th>NP</th>
<th>NK</th>
<th>PK</th>
<th>NPK</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banaswara</td>
<td>Red and black</td>
<td>8</td>
<td>830</td>
<td>270</td>
<td>150</td>
<td>30</td>
<td>72.0</td>
<td>20</td>
<td>-60</td>
<td>10</td>
<td>-50</td>
</tr>
<tr>
<td>Pali Desert</td>
<td></td>
<td>4</td>
<td>720</td>
<td>140</td>
<td>-40</td>
<td>0</td>
<td>56.0</td>
<td>20</td>
<td>-20</td>
<td>20</td>
<td>-30</td>
</tr>
</tbody>
</table>

**Treatment**

<table>
<thead>
<tr>
<th>Av. response of grain in Kg/ha.</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&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;K&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>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>64 (S.F.T.)</td>
<td>-15</td>
<td>-1</td>
<td>13</td>
<td>100</td>
<td>155</td>
<td>133</td>
<td>35.8</td>
</tr>
</tbody>
</table>

Control yield = 569 Kg/ha.; No. of trials = 4.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>K&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&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;K&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>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 (S.F.T.)</td>
<td>-21</td>
<td>26</td>
<td>111</td>
<td>139</td>
<td>174</td>
<td>105</td>
<td>30.9</td>
</tr>
</tbody>
</table>

Control yield = 716 Kg/ha.; No. of trials = 6.

**Ref:** Rj. 60 (S.F.T.).

**Type:** 'M'.
Crop :- Maize.  
Site :- (District) Banaswara and Pali.  

Object :- To investigate the relative efficiency of different nitrogenous fertilizers at different doses (Type : B).

1. BASAL CONDITIONS :
(i) N.A.  (ii) Red and black ; Desert soil.  (iii) to (x) N.A

2. TREATMENTS :
O =Control (no manure).

\[ n_1 = 22.4 \text{ Kg/ha. of N as A/S.} \]
\[ n_2 = 44.8 \text{ Kg/ha. of N as A/S.} \]
\[ n'_1 = 22.4 \text{ Kg/ha. of N as Urea.} \]
\[ n'_2 = 44.8 \text{ Kg/ha. of N as Urea.} \]
\[ n_1'' = 22.4 \text{ Kg/ha. of N as C/A/N.} \]
\[ n_2'' = 44.8 \text{ Kg/ha. of N as C/A/N.} \]

3. DESIGN :

4. GENERAL :
(i) to (vii) N.A.

5. RESULTS :
Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>District</th>
<th>No. of trials</th>
<th>O</th>
<th>n_1</th>
<th>n_2</th>
<th>n'_1</th>
<th>n'_2</th>
<th>n_1''</th>
<th>n_2''</th>
<th>G.M.</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banaswara</td>
<td>8</td>
<td>780</td>
<td>1082</td>
<td>1210</td>
<td>1110</td>
<td>1150</td>
<td>1080</td>
<td>1320</td>
<td>1104</td>
<td>47.4</td>
</tr>
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<td>Pali</td>
<td>3</td>
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<td>830</td>
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</tr>
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</table>

Crop :- Maize (Kharif).  
Site :- Govt. Agri. Farm, Tabiji.  

Object :- To find out the effect of detasseling Maize at different stages on the yield of Maize.

1. BASAL CONDITIONS :
(i) (a) Maize-Wheat.  (b) Wheat.  (c) 67.3 Kg/ha. of N + 44.8 Kg/ha. of P_2O_5.  (ii) Sandy loam.  (iii) 20.7.61.  (iv) (a) 3 ploughings.  (b) and (c) N.A.  (d) 61 cm. between rows.  (e) N.A.  (v) N.A.  (vi) Basii (selected).  (vii) Un-irrigated.  (viii) and (ix) N.A.  (x) Sept.; 61.

2. TREATMENTS :
All combinations of (1) and (2) with a control.

(1) 2 types of detasseling : D_1 =Partial detasseling and D_2 =Detasseling in alternate rows.
(2) 2 periods of detasseling : T_1 =12 weeks after emergence and T_2 =2 weeks after emergence.

3. DESIGN :
(i) L. Sq.  (ii) (a) 5.  (b) N.A.  (iii) 5.  (iv) (a) 9.8 m. x 6.1 m.  (b) 9.2 m. x 5.5 m.  (v) 30 cm. x 30 cm.  (vi) Yes.

4. GENERAL :
(i) and (ii)-N.A.  (iii) Yield of grain and fodder.  (iv) (a) N.A.  (b) —N.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS :
(i) 3035 Kg/ha.  (ii) 419.1 Kg/ha.  (iii) N.s of the effects is significant.  (iv) Av. yield of grain in Kg/ha.
Crop :- Maize (Kharif).

Site :- Govt. Agri. Farm, Bassi.

Object :- To study the effect of different spacings and fertilizers on the yield of Maize.

1. BASAL CONDITIONS :
(i) (a) Wheat-Maize. (b) Wheat. (c) Nil. (ii) Sandy loam. (iii) 19.7.62. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) Bassi selected. (vii) Un-irrigated. (viii) 1 weeding. (ix) N.A. (x) 16.11.62.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 3 spacings between rows: S₁ = 46, S₂ = 61 and S₃ = 76 cm.
(2) 3 levels of fertilizers:
  M₀ = 0, M₁ = 67.3 Kg/ha. of N + 44.8 Kg/ha. of P₀ + 22.4 Kg/ha. of K₀
  M₂ = 89.7 Kg/ha. of N + 44.8 Kg/ha. of P₀ + 22.4 Kg/ha. of K₀

3. DESIGN :
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 9'1 m. x 6'1 m. (b) 8'2 m. x 5'5 m. (v) 46 cm. x 30 cm. (vi) Yes.

4. GENERAL :
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) and (b) N.A. (c) Nil. (v) to (vii) Nil.

5. RESULTS :
(i) 2926 Kg/ha. (ii) 491.7 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
<td>Mean</td>
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<td>2784</td>
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</tbody>
</table>

C. D. for M marginal means=414.2 Kg/ha.

Crop :- Maize (Kharif).

Site :- Govt. Agri. Farm, Sriganganagar.

Object :- To study the effect of different spacings and fertilizers on the yield of Maize.
1. **BASAL CONDITIONS**

(i) (a) Wheat-Maize. (b) Wheat. (c) N.A.  
(ii) Sandy loam. (iii) 10.7.62.  
(iv)(a) 3 ploughings, (b) and (c) N.A.  
(d) As per treatments. (e) N.A.  
(v) N.A.  
(vi) Bassi (selected). (vii) Irrigated.  
(viii) and (ix) N.A.  
(x) 22.10.62.

2. **TREATMENTS**

Same as in expt. no. 62(40) conducted at Bassi on page no. 212.

3. **DESIGN**

(i) Fact in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 12.2 m. x 9.1 m.  
(v) Nil. (vi) Yes.

4. **GENERAL**

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) and (b) N.A. (c) Nil.  
(v) to (vii) Nil.

5. **RESULTS**

(i) 464 Kg/ha.  
(ii) 120.2 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of grain in Kg/ha.

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<th>S3</th>
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<td>419</td>
<td>464</td>
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C. D. for M marginal means—10.2 Kg/ha.

---

**Crop:** Maize (Kharij).

**Site:** M.A.E. Centre, Sriganganagar.

**Ref:** Rj.63 (MAE).

Object:—Type XIII. To study the effect of different spacings and fertilizers on the yield of Maize.

1. **BASAL CONDITIONS**

(i) (a) to (c) N.A. (ii) Desert soil. (iii) 16.7.63. (iv) (a) to (e) N.A. (v) N.A. (vi) (147 days) As per treatments. (vii) Irrigated. (viii) and (ix) N.A. (x) 9.12.1963.

2. **TREATMENTS**

**Main-plot treatments**

All combinations of (1), (2) and (3)  
(1) 3 dates of sowing:  
D1 = 1.7.63, D2 = 16.7.63 and D3 = 2.8.63.  
(2) 3 varieties:  
V1 = Local, V2 = Hybrid and V3 = Bassi.  
(3) 3 levels of N:  
N0 = 0, N1 = 57.2, and N2 = 134.4 Kg/ha.

**Sub-plot treatments**

All combinations of (1) and (2)  
(1) 2 levels of P2O5:  
P0 = 0 and P1 = 22.2 Kg/ha.  
(2) 2 levels of K2O:  
K0 = 0 and K1 = 89.6 Kg/ha.

3. **DESIGN**

(i) Split-plot contd. (ii) (a) 3 blocks/replication; 9 main-plots/block, 4 sub-plots main-plot. (b) N.A.  
(iii) (a) and (b) N.A.  
(iv) (a) and (b) N.A.  
(v) and (vi) Yes.

4. **GENERAL**

(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1963 only. (b)—(c) Nil. (v) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 233 Kg/ha. (ii) (a) 55·2 Kg/ha. (b) 29·0 Kg/ha. (iii) Main effects of V, P and K are highly significant. Main effect of N is significant. (iv) Av. yield of grain Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>D_1</th>
<th>D_2</th>
<th>D_3</th>
<th>V_1</th>
<th>V_2</th>
<th>V_3</th>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
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</table>

C.D. for N or V marginal means=32·0 Kg/ha.
C.D. for P or K marginal means=12·0 Kg/ha.

Crop :- Maize (Kharif).
Site :- Govt. Agri. Farm, Banswara,
Object :- To determine the relative efficacy of seed dressing fungicides in relation to yield and germination of Maize.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Maize. (c) 33·6 Kg/ha. of N. (ii) Black cotton soil. (iii) 18.7.64. (iv) (a) 2 ploughings, 2 bakherings, 1 discing and 4 plankings. (b) Dibbling. (c) As per treatments. (d) 61 em. x 30 em. (e) 1. (v) 7·4 C.L./ha. of F.Y.M. (vi) Local. (vii) Unirrigated. (viii) 4 weedings. (ix) N.A. (x) 22.10.64.

2. TREATMENTS:
10 seed dressing treatments: T_0 = Control, T_1 = 3 gm. of Agrosan, T_2 = 2 gm. of eresan, T_3 = 2 gm. of Tillex, T_4 = 2 gm. of Lunasan, T_5 = 2 gm. of Harvasan, T_6 = 3 gm. of Thiram, T_7 = 2 gm. of Phygon XL, T_8 = 2 gm. of shell seed dresser and T_9 = 2 gm. of Merceline.

Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
(i) Incomplete L. Sq. (ii) (a) 3 plots/block, 10 blocks/sq. and 35 sq. (b) N.A. (iii) 9. (iv) (a) and (b) 2·7 m. x 1·8 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1964—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2721 Kg/ha. (ii) 743·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.
### Crop: Maize (Kharif)

**Site:** Govt. Agri. Farm, Tabiji.

**Object:** To study the effect of different levels and formulations of weedicides in the control of weeds in Maize.

#### 1. BASAL CONDITIONS:

- **(i)** (a) N.A. for 60(8); Wheat-Maize for others. (b) Wheat.  
  - (c) 44.8 Kg/ha. of N for 60(8); 44.8 Kg/ha. of N + 44.8 Kg/ha. of P₂O₅ for others.  
  - (ii) Sandy loam.  
  - (iv) 5 ploughings for 60(8); 3 ploughings for others.  
  - (c) 22 Kg/ha. for 60(8); 18 Kg/ha. for others.  
  - (d) 46 cm. for 60(8) and 61 cm. between rows for others.  
  - (e) N.A.  
  - (vi) Local for 60(8); Bassi (selected) for others.  
  - (vii) Unirrigated for 60(8), 62(4); Irrigated for 61(3).  
  - (viii) and (ix) N.A.

#### 2. TREATMENTS:

- All combinations of (1) and (2) with 2 extra treatments
  
  1. 4 types of weedicides:  
     - **W₁** = Sodium salt of 2, 4-D,  
     - **W₂** = Ethyl ester of 2, 4-D,  
     - **W₃** = Amine salt of 2, 4-D,  
     - **W₄** = Sodium salt of M.C.P.A.
  
  2. 3 levels of weedicides:  
     - **L₁** = 0.56,  
     - **L₂** = 1.12,  
     - **L₃** = 1.68 Kgf/ha.  

#### 3. DESIGN:

- (i) Fact. in R.B.D.  
- (ii) 14.  
- (iii) 4.  
- (iv) (a) 7.3 m. x 5.5 m.  
- (b) 5.5 m. x 3.7 m.  
- (v) 91 cm. x 91 cm.  
- (vi) Yes.

#### 4. GENERAL:

- (i) and (ii) N.A.  
- (iii) Yield of grain.  
- (iv) (a) 1960 to 1962.  
- (b) No.  
- (c) Results of combined analysis given under 5. Results.  
- (v) and (vi) N.A.  
- (vii) Error variances are homogeneous and the Treatments x years interaction is present.

#### 5. RESULTS:

- (i) 2310 Kg/ha.  
- (ii) 626.0 Kg/ha. [22 df made up of Treatments x years interaction]. (iii) None of the effects is significant.  
- (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>W₁</th>
<th>W₂</th>
<th>W₃</th>
<th>W₄</th>
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<td>2345</td>
<td>2229</td>
<td>2162</td>
<td>2310</td>
</tr>
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</table>

**Av. yield for extra treatments:**

- **E₀** = 2074 Kg/ha.  
- **E₁** = 4572 Kg/ha.  

- **For 61(3)***  
  
  **For 62(4)***  
  
  **For 60(8)***  

Control (2 plots) = 881 Kg/ha.
Crop :- Maize (Kharif).

Ref :- Rj. 60(4), 61(4), 62(11).

Site :- Govt. Agri. Farm, Tabiji.

Type :- 'D'.

Object :- To find out the economic method of controlling weeds in Maize.

1. BASAL CONDITIONS:

(i) (a) Wheat-Maize. (b) Wheat. (c) 44.8 Kg/ha. of N for 60(4); 44.8 Kg/ha. of N+44.8 Kg/ha. of P2O5 for others. (ii) Sandy loam. (iii) 6.7.1960; 10.7.1961; 13.7.1262. (iv) (a) 3 to 5 ploughings. (b) N.A. (c) 22 Kg/ha. for 60(4); 18 Kg/ha. for 61(4); 9 Kg/ha. for 62(11). (d) 46 to 61 cm. between rows. (e) N.A. (v) N.A. (vi) Local for 60(4); Bassi (selected) for others. (vii) Irrigated. (viii) and (ix) N.A. (x) 1.10.1960; 8.10.1961; 25.10.1962.

2. TREATMENTS:

9 weedicidal treatments: W0=Control, W1=Local method of weeding, W2=Pre-emergence spray of weedicides, W3=Post-emergence spray of weedicides, W4=Post-emergence spray of weedicides (twice), W5=Pre-emergence+Post-emergence spray of weedicides, W6=W1+W2, W7=W1+Ws and W8=W1+W2+W3.

3. DESIGN:

(i) R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) 7.3 m. x 5.5 m. (b) 5.5 m. x 3.7 m. (v) 91 em. x 91 em. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 to 1962. (b) No. (c) Results of combined analysis given under 5. Results. (v) Udaipur. (vi) Nil. (vii) Error variances are heterogeneous and Treatments x years interaction is present.

5. TREATMENTS:

(i) 3043 Kg/ha. (ii) 891.2 Kg/ha. [based on 16 d.f. made up of Treatments x years interaction.] (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W0</th>
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<th>W2</th>
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<tr>
<td>C.D. = 771.3 Kg/ha.</td>
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</table>

Crop :- Maize (Kharif).

Ref :- Rj. 60(5).

Site :- Govt. Agri. Farm, Udaipur.

Type :- 'D'.

Object :- To study the effect of different levels and formulations of weedicides in the control of weeds in Maize.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Wheat. (c) 44.8 Kg/ha. of N. (ii) Clay loam. (iii) 14.7.60. (iv) (a) 4 ploughings. (b) N.A. (c) 22 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) N.A. (vi) Bassi (selected). (vii) Irrigated. (viii) and (ix) N.A. (x) 11.10.60.

2. TREATMENTS:

Main-plot treatments:

4 weedicides: W1=Sodium Salt of 2, 4-D, W2=Ethylester of 2, 4-D, W3=Amine salt of 2, 4-D and W4=Sodium salt of M.C.P.A.

Sub-plot treatments:

5 doses of weedicides: D1=0, D2=0.56, D3=0.84, D4=1.12 and D5=1.40 Kg/ha. of acid equivalent.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main plots/replication 5 sub-plots/main plot. (b) N.A. (iii) 2. (iv) (a) 7.3 m. x 5.5 m. (b) 5.5 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1958 to 1962. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 1069 Kg/aa. (ii) (a) 445·1 Kg/ha. (b) 482·7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

\[ D_0 = 978 \text{ Kg/ha.} \]

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<th>( D_1 )</th>
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<td>1137</td>
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<tr>
<td>( W_4 )</td>
<td>975</td>
<td>368</td>
<td>1074</td>
<td>862</td>
<td>820</td>
</tr>
<tr>
<td>Mean</td>
<td>1314</td>
<td>809</td>
<td>1211</td>
<td>1035</td>
<td>1g92</td>
</tr>
</tbody>
</table>

**Crop:** Maize (Kharif).

**Ref:** Rj. 61(7).

**Site:** Govt. Agri. Farm, Udaipur.

**Type:** ‘D’.

Object:—To study the effect of different levels and formulations of weedicides in the control of weeds in Maize.

1. BASAL CONDITIONS:
(i) (a) Wheat-Maize. (b) Wheat. (c) 44·8 Kg/ha. (ii) Clay loam. (iii) 13.7.61. (iv) (a) 3 ploughings. (b) N.A. (c) 22 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. (vi) Malan. (vii) Irrigated... (viii) and (ix) N.A. (x) 5.11.61.

2. TREATMENTS:
All combinations of (1) and (2)+2 extra treatments.
(1) 4 weedicides: \( W_1 = \text{Sodium salt of 2, 4-D, } W_2 = \text{Ethyl Ester of 2, 4-D, } W_3 = \text{Amine salt of 2, 4-D, and } W_4 = \text{Sodium salt of M.C.P.A.} \)
(2) 3 doses of weedicides: \( D_1 = 0.60, D_2 = 1.12 \) and \( D_3 = 1.68 \) Kg/ha. acid equivalent.
Extra treatments: \( E_0 = \text{Control and } E_1 = \text{Local method of weeding.} \)

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 14. (b) N.A. (iii) 4. (i) (a) 7·3 m. x 5·5 m. (b) 5·5 m. x 3·7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1958-1962. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2135 Kg/ha. (ii) 488·0 Kg/ha. (iii) E effect alone is highly significant. (iv) Av. yield of grain in Kg/ha.

\[ E_0 = 1328 \text{ Kg/ha. and } E_1 = 2719 \text{ Kg/ha.} \]

<table>
<thead>
<tr>
<th></th>
<th>( D_1 )</th>
<th>( D_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( W_1 )</td>
<td>1808</td>
<td>1533</td>
<td>2642</td>
</tr>
<tr>
<td>( W_2 )</td>
<td>2232</td>
<td>2105</td>
<td>2074</td>
</tr>
<tr>
<td>( W_3 )</td>
<td>2232</td>
<td>2218</td>
<td>2253</td>
</tr>
<tr>
<td>( W_4 )</td>
<td>2381</td>
<td>1900</td>
<td>2369</td>
</tr>
<tr>
<td>Mean</td>
<td>2163</td>
<td>1939</td>
<td>2359</td>
</tr>
</tbody>
</table>

C.D. for E means = 697·1 Kg/ha.
Crop: Maize (Kharif).
Site: Rajasthan College of Agri., Udaipur.

Object: To study the effect of soil applied herbicides on the yield of Maize forage.

1. BASAL CONDITIONS:
   
   (i) (a) Nil. (b) and (c) N.A. (ii) Clay loam. (iii) 15.4.64. (iv) (a) Ploughed and cross-ploughed. (b) Drilling. (c) 30 Kg/ha. (d) and (e) N.A. (v) N.A. (vi) Malan. (vii) Unirrigated. (viii) and (ix) N.A. (x) 14.7.64.

2. TREATMENTS:
   
   All combinations of (1) and (2) with one control.
   
   (1) 8 herbicidal treatments: 
   
   \[ H_1 = \text{Sodium salt of 2, 4-D at 10.0 Kg/ha.} \], \[ H_2 = \text{Sodium salt of 2, 4-D at 20.0 Kg/ha.} \], \[ H_3 = \text{Sodium salt of 2, 4-D with Borax at 1.0 Kg/ha.} \], \[ H_4 = \text{Sodium salt of 2, 4-D with Borax at 2.0 Kg/ha.} \], \[ H_5 = \text{T.C.A. at 10.0 Kg/ha.} \], \[ H_6 = \text{T.C.A. at 20.0 Kg/ha.} \], \[ H_7 = \text{Simazine at 1.8 Kg/ha.} \], and \[ H_8 = \text{Simazine at 3.6 Kg/ha.} \].

   (2) 3 times of spraying: 
   
   \[ T_1 = \text{Pre-planting} \], \[ T_2 = \text{Pre-planting (twice)} \], and \[ T_3 = \text{Pre-mergence} \].

3. DESIGN:
   
   (i) Fact. in R.B.D. (ii) (a) 25. (b) N.A. (ii) 2. (iv) (a) N.A. (b) 8 m. x 5 m. (v) N.A. (vi) Yes.

4. GENERAL:
   
   (i) Fair. (ii) Nil. (iii) Yield of grain. (iv) (a) 1954 only. (b) —. (c) Nil. (y) to (vii) Nil.

5. RESULTS:
   
   (i) 2251 Kg/ha. (ii) 5100 Kg/ha. (iii) Main effect of H shows significant. (iv) Av. yield of grain in Kg/ha.

   Control=2110 Kg/ha.

\[
\begin{array}{cccccccc}
H_1 & H_2 & H_3 & H_4 & H_5 & H_6 & H_7 & H_8 & \text{Mean} \\
T_1 & 2020 & 2300 & 1980 & 1740 & 2200 & 2580 & 2790 & 2500 & 2264 \\
T_2 & 2060 & 2290 & 1860 & 2290 & 2110 & 2620 & 2350 & 2480 & 2257 \\
T_3 & 1940 & 1990 & 1860 & 1540 & 1620 & 1970 & 3080 & 4000 & 2250 \\
\text{Mean} & 2007 & 2193 & 1900 & 1857 & 1977 & 2390 & 2740 & 2993 & 2257 \\
\end{array}
\]

C.D. for H marginal means=607.6 Kg/ha.

Crop: Maize (Kharif).
Site: Rajasthan College of Agri., Udaipur.

Object: To evaluate herbicidal efficiency of a few weeds in the control of weeds in Maize under varying soil fertility.

1. BASAL CONDITIONS:
   
   (i) (a) Nil. (b) Gram. (c) N.A. (ii) Clay loam. (iii) 28.5.64. (iv) (a) Ploughed and cross ploughed. (b) Drilling. (c) 25 Kg/ha. (d) and (e) N.A. (v) 60 Kgf/ha. of N, A, S. (vi) Malan. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 7.10.64.
2. TREATMENTS:
   All combinations of (1), (2) and (3).
   (1) 6 herbicidal treatments: H1 = Hard weeding (no herbicide), H2 = Simazine 1 Kg/ha.; H3 = 2,4-D Sodium salt 1 Kg/ha. + 2,4-D Amine salt 0.5 Kg/ha., H4 = 2,4-D Sodium salt 1 Kg/ha. + P.C.P. 1.5 Kg/ha., H5 = T.C.A. 2 Kg/ha. + P.C.P. 1.5 Kg/ha.
   (2) 3 levels of manures: M0 = Control (no manure), M1 = 62 Kg/ha. of N+17 Kg/ha. of P205 + 20 Kg/ha. of K2O and M2 = 75 Kg/ha. of N+20 Kg/ha. of P205 + 35 Kg/ha. of K2O.
   (3) 2 stages of spraying of herbicides: C1 = Pre-emergence and C2 = Post-emergence.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 36, (b) 51.5 m. x 85.0 m. (iii) 4. (iv) (a) 9.0 m. x 6.0 m. (b) 8.0 m. x 5.0 m. (v) 50 cm. x 50 cm. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Observation on weeds, crop plants, dry matter production, yield of grain and its attributes. (iv) (a) to (c) No. (v) to (vii) Nil.

5. RESULTS:
   (i) 1345 Kg/ha. (ii) 296 Kg/ha. (iii) Main effects of H, C, M, and interaction H x C are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>H1</th>
<th>H2</th>
<th>H3</th>
<th>H4</th>
<th>H5</th>
<th>H6</th>
<th>C1</th>
<th>C2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>1768</td>
<td>938</td>
<td>750</td>
<td>1437</td>
<td>844</td>
<td>1037</td>
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<td>1314</td>
<td>1297</td>
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<tr>
<td>1750</td>
<td>2462</td>
<td>1344</td>
<td>1438</td>
<td>1312</td>
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<td>2097</td>
<td>1082</td>
<td>1114</td>
<td>1356</td>
<td>1085</td>
<td>1251</td>
<td>1438</td>
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<tr>
<td>C1</td>
<td>854</td>
<td>1758</td>
<td>1184</td>
<td>1124</td>
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<td>C2</td>
<td>1812</td>
<td>2437</td>
<td>979</td>
<td>1104</td>
<td>1358</td>
<td>941</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   C.D. for H marginal means =170.7 Kg/ha.
   C.D. for M marginal means =120.7 Kg/ha.
   C.D. for C marginal means =98.5 Kg/ha.
   C.D. for means in the body of H x C table =241.4 Kg/ha.

   **Crop:** Maize (Kharif).
   **Site:** Govt. Agri. Farm, Udaipur.
   **Ref:** Rj. 60(14), 61(6), 62(8).
   **Type:** 'D'.

   Object: —To find out the economic way of controlling weeds in Maize.

1. BASAL CONDITIONS:
   (i) (a) N.A. for 60 (14), 62 (8); Wheat-Maize for 61 (6). (b) Wheat. (c) 44.8 Kg/ha. of N for 60 (14), 62 (8); 37 C.L./ha. of F.Y.M. for 62 (8). (ii) Clay loam. (iii) 18.7; 12.7; 60; 22.7; 62. (iv) (a) 3 to 4 ploughings. (b) N.A. (c) 22 Kg/ha. (d) 30 to 46 cm. between rows. (e) N.A. (v) N.A. (vi) Bassi (selected) for 60 (14); Malan for others. (vii) Irrigated for 60 (14); Unirrigated for others. (viii) and (ix) N.A. (e) 16.10.60; 31.10.61; N.A. for 62 (8).

2. TREATMENTS:
   9 methods of controlling weeds: W0 = Control (unweeded), W1 = Local method of weeding, W2 = Pre-emergence application (once), W2 = Post-emergence application (once), W3 = Post-emergence application (twice), W4 = Pre + Post-emergence (once), W5 = Pre-emergence application + weeding, W6 = Post emergence + weeding and W7 = Pre + Post-emergence application + weeding.
3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 7·3 m. x 5·5 m. for 60 (14), 61 (6); 5·5 m. x 5·5 m. for 62 (8), (b) 5·5 m. x 3·7 m. for all (v) 91 c.m. x 91 c.m. for 63 (14), 61 (5); 91 c.m. o.t 224 sq. f. for 62 (8). (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1959 to 1962. (b) No. (c) Results of combined analysis given under 5. Results. (v) Tabiji. (vi) Nil. (vii) Expt. no. 59 (7) has also been included while giving combined results. Error variances are homogeneous and the Treatments x years interaction is absent.

5. RESULTS:
(i) 2141 Kg/ha (ii) 630·9 Kg/ha. (based on 120 d. f. made up of Treatments x years interaction and pooled error). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>W₁</th>
<th>W₂</th>
<th>W₃</th>
<th>W₄</th>
<th>W₅</th>
<th>W₆</th>
<th>W₇</th>
<th>W₈</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1724</td>
<td>2496</td>
<td>2041</td>
<td>2172</td>
<td>1967</td>
<td>2169</td>
<td>2311</td>
<td>2021</td>
</tr>
<tr>
<td>C.D. = 441·6 Kg/ha.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Crop : - Maize (Kharif).
Site : - Govt. Agri. Farm, Udaipur.
Object : - To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Maize.

1. BASAL CONDITIONS:
(i) (a) N.A. for 60(15) : Nil for 61(8). (b) Wheat. (c) 44·8 Kg/ha. of N. (ii) Clay loam. (iii) 14.7.1960; 12.7.1961. (iv) (a) 3 ploughings. (b) Dibbling. (c) N.A. (d) 46 cm. x 30 cm. (e) 3. (v) N.A. (vi) Malan (vii) Irrigated. (viii) and (ix) N.A. (x) 20.10.1960; 28.10.1961.

2. TREATMENTS:
8 fungicidal treatments: T₁=Control, T₂=3 gm. of Agrosan G.N., T₃=2 gm. of Ceresan, T₄=2 gm. of Tillex, T₅=2 gm. of Lunaasan, T₆=2 gm. of Hervasan, T₇=3 gm. of Thiram and T₈=4 gm. of Sulphur.

Treatments applied per Kg. of seed as dressing.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 4·6 m. x 2·7 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960 to 1962 (treatment modified in 62). (b) No. (c) Results of combined analysis are given under 5 Results. (v) and (vi) Nil. (vii) Error variances are heterogeneous and Treatments x years interaction is present.

5. RESULTS:
(i) 1991 Kg/ha. (ii) 980·9 Kg/ha. [based on 7 d.f. made up of Treatments x years interaction]. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1756</td>
<td>2577</td>
<td>2106</td>
<td>1984</td>
<td>1767</td>
<td>1990</td>
<td>1851</td>
</tr>
</tbody>
</table>

C.D. = 441·6 Kg/ha.
Crop :- Maize *(Kharif)*.

Site :- Govt. Agri. Farm, Udaipur.

Object :- To determine the relative efficiency of seed dressing fungicides in relation to germination and yield of Maize.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Wheat. (c) 44.8 Kg/ha. of N. (ii) Clay loam. (iii) 23.7.62. (iv) (a) 4 ploughings. (b) Dibbling. (c) N.A. (d) 46 cm. x 30 cm. (e) 3. (v) N.A. (vi) Malan. (vii) Unirrigated. (viii) and (ix) N.A. (x) 5.11.62.

2. TREATMENTS:
   8 fungicidal treatments: $T_0$ = Control, $T_1$ = 3 gm. of Agrosan G.N., $T_2$ = 2 gm. of Ceresan, $T_3$ = 2 gm. of Tillex, $T_4$ = 2 gm. of Lunasan, $T_5$ = 2 gm. of Hervasan, $T_6$ = 3 gm. of Thiram and $T_7$ = 2 gm. of Reej powder.

3. DESIGN:
   and 4. GENERAL:
   Same as in Expt. No. 60(15) on page no. 220.

5. RESULTS:
   (i) 3843 Kg/ha. (ii) 625·9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>3394</td>
<td>3838</td>
<td>3941</td>
<td>4107</td>
<td>4114</td>
<td>3684</td>
<td>3836</td>
<td>3812</td>
</tr>
</tbody>
</table>

Crop :- Gram *(Rabi).*

Site :- Govt. Agri. Farm, Bassi.

Object :- To study the effect of different levels of N, P and K on the yield of Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 11.10.64. (iv) (a) 5 ploughings and planking. (b) Line sowing. (c) 56 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) R.S. 10. (vii) Irrigated. (viii) Nil. (ix) Negligible. (x) 2.4.65.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 2 levels of N as A/S: $N_0$ = 0 and $N_1$ = 22.4 Kg/ha.
   (2) 3 levels of $P_2O_5$ as Super: $P_0$ = 0, $P_1$ = 22.4 and $P_2$ = 44.8 Kg/ha.
   (3) 2 levels of $K_2O$ as Mur. Pot.: $K_0$ = 0 and $K_1$ = 22.4 Kg/ha.

3. DESIGN:
   (i) 3 x 2^2 confd. (ii) (a) 6 plots/block; 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964 contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1895 Kg/ha. (ii) 404·1 Kg/ha. (iii) Main effect of P alone is significant. (iv) Av. yield of grain in Kg/ha.
2. TREATMENTS:

Main-plot treatments:
3 methods of application: $M_2$ = Full dose as soil application, $M_3$ = Half as soil + half as foliar and $M_4$ = Full dose as foliar in two splits.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 levels of N: $N_2$ = 0 and $N_1$ = 18.5 Kg/ha.
(2) 3 levels of P: $P_2$ = 0, $P_1$ = 18.5 and $P_0$ = 37.1 Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 5.5 m. x 3.7 m. (b) 4.9 m. x 3.1 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1964—contd. (treatments modified). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 2195 Kg/ha. (ii) (a) 341.8 Kg/ha. (b) 388.1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$N_0$</th>
<th>$N_1$</th>
<th>Mean</th>
</tr>
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<td>2206</td>
<td>2129</td>
<td>2147</td>
<td>2152</td>
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</tr>
<tr>
<td>2168</td>
<td>2157</td>
<td>2366</td>
<td>2150</td>
<td>2189</td>
<td>2229</td>
</tr>
<tr>
<td>1963</td>
<td>2325</td>
<td>2124</td>
<td>2209</td>
<td>2222</td>
<td>2206</td>
</tr>
</tbody>
</table>

Mean 2217 2230 2137 2202 2187 2195

Crop :- Gram (Rabi).
Site :- Govt. Agri. Res. Farm, Sriganganagar.
Object :- To study the effect of N, P and molybdenum on the yield of gram.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Sandy loam. (iii) 31.10.63. (iv) (a) Ploughing. (b) Drilling. (c) 62 Kg/ha. (d) 30 cm. between rows. (e) N.A. (f) Nil. (g) R.S.—10. (h) Irrigated. (i) 2 wer/duny. (ii) N.A. (x) 6.4.64.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 2 levels of molybdenum: $M_0$ = 0 and $M_1$ = 1.1 Kg/ha.
(2) 3 levels of N: $N_0$ = 0, $N_1$ = 16.8 and $N_2$ = 33.6 Kg/ha.
(3) 3 levels of $P_0$: $P_0$ = 0, $P_1$ = 33.6 and $P_2$ = 67.2 Kg/ha.

3. DESIGN:
(i) 3 x 2 Fact. confd. (ii) 6 plots/block, 3 blocks/replication. (b) N.A. (iii) 4. (iv) (a) 5.5 m. x 3.7 m. (b) 4.9 m. x 3.1 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1952—1954 (b) No. (c) Nil. (v) to (vii) Nil.
RESULTS:
(i) 948 Kg/ha. (ii) 218 Kg/ha. (iii) Main effect of P is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
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<td>M₀</td>
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<td>979</td>
<td>946</td>
<td>764</td>
<td>813</td>
<td>1124</td>
<td>900</td>
</tr>
<tr>
<td>M₁</td>
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<td>1044</td>
<td>928</td>
<td>846</td>
<td>1003</td>
<td>1136</td>
<td>995</td>
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<tr>
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</tr>
</tbody>
</table>

C.D. for P marginal means=126.9 Kg/ha.

Crop:- Gram (Rabi).

Site:- Govt. Agri. Res. Farm, Sriganganagar.

Object:- To study the effect of N and P with and without molybdenum on Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 27.10.64. (iv) (a) 2 ploughings. (b) Drilling. (c) 62 Kg/ha. (d) 30 cm. between rows. (v) Nil. (vi) R.S—10. (vii) Irrigated. (viii) 2 hand hoeings. (ix) N.A. (x) S.A. 65.

2. TREATMENTS:
   (1) 3 levels of N: N₀=0, N₁=18.5 and N₂=37.1 Kg/ha.
   (2) 3 levels of P₂O₅: P₀=0, P₁=37.1 and P₂=74.1 Kg/ha.
   (3) 2 levels of Molybdenum: M₀=0 and M₁=1.2 Kg/ha.

3. DESIGN and 4. GENERAL:
   Same as in expt. no. 63(63) on page no. 224.

5. RESULTS:
   (i) 1963 Kg/ha. (ii) 312.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
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**Crop:** Gram (*Rabi*).

**Ref:** Rj. 62(76).

**Site:** Govt. Agri. Res. Farm, Sultanpur.

**Type:** ‘MV’.

Object:—To study the effect of split application of different levels of P on Gram.

1. **BASAL CONDITIONS:**

   (i) (a) to (c) Nil.  
   (ii) (a) Black cotton soil.  
   (b) N.A.  
   (iii) 21.10.62.  
   (iv) 2 bakherings and 2 ploughings with desi plough.  
   (b) Behind the plough.  
   (c) 74 Kg/ha.  
   (d) 30 cm between rows.  
   (e) N.A.  
   (v) Nil.  
   (vi) R.S.—10.  
   (vii) Irrigated.  
   (viii) Hoeing.  
   (ix) N.A.  
   (x) 1st week of April, 63.

2. **TREATMENTS:**

   **Main-plot treatments:**
   - 3 levels of $P_2O_5$ as Super: $P_0=0$, $P_1=33.6$ and $P_2=67.2$ Kg/ha.

   **Sub-plot treatments:**
   - 10 methods of applications:
     - $M_1$ = Full dose at sowing by broadcast, $M_2$ = Full dose at sowing by drilling, $M_3$ = Half at sowing by broadcast + half as top dressing, $M_4$ = Half at sowing by drilling + half as top dressing, $M_5$ = Half at sowing by broadcast + $\frac{1}{4}$ as top dressing, $M_6$ = Half at sowing by drilling + $\frac{1}{4}$ as top dressing, $M_7$ = Half at sowing by broadcast + $\frac{1}{4}$ as top dressing after a month + $\frac{1}{4}$ as top dressing at flowering and $M_8$ = Half at sowing by drilling + $\frac{1}{4}$ as top dressing after a month + $\frac{1}{4}$ as top dressing at flowering.

3. **DESIGN:**

   (i) Split-plot, (ii) (a) 3 main-plots/replication, 10 sub-plots/main-plot.  
   (b) Nil.  
   (iii) 4.  
   (iv) (a) 3’1 m. x 2’4 m.  
   (b) 2’4 m x 1’8 m.  
   (v) 30 cm. x 30 cm.  
   (vi) Yes.

4. **GENERAL:**

   (i) Good.  
   (ii) Nil.  
   (iii) Yield of grain.  
   (iv) (a) 1962—contd.  
   (b) No.  
   (c) Nil.  
   (v) to (vii) Nil.

5. **RESULTS:**

   (i) 1466 Kg/ha.  
   (ii) (a) 505·0 Kg/ha.  
   (b) 236·4 Kg/ha.  
   (iii) Main effect of P and interaction $P \times M$ are highly significant and main effect of $M$ is significant.  
   (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
<th>$M_5$</th>
<th>$M_6$</th>
<th>$M_7$</th>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
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<td>1374</td>
<td>1626</td>
<td>1738</td>
<td>1934</td>
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<td>1514</td>
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<td>1388</td>
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<tr>
<td>$P_2$</td>
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<td>1682</td>
<td>1714</td>
<td>1878</td>
<td>2046</td>
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</tbody>
</table>

Mean:
- 1654
- 1780
- 1626
- 1752
- 1752
- 1598
- 1619
- 1584
- 1717
- 1633

- C.D. for $P$ marginal means $= 276·3$ Kg/ha.
- C.D. for $M$ marginal means $= 192·4$ Kg/ha.
- C.D. for $M$ means at the same level of $P = 333·2$ Kg/ha.
- C.D. for $P$ means at the same level of $M = 417·6$ Kg/ha.

---

**Crop:** Gram (*Rabi*).

**Ref:** Rj. 60(73)

**Site:** Govt. Agri. Res. Farm, Borkhera.

**Type:** ‘MV’.

Object:—To study the effect of different levels of N and P on different varieties of Gram.
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Jowar. (c) 22.4 Kg/ha. of N as A/S. (ii) Clay loam. (iii) 7,10,60. (iv) (a) 3 ploughings. (b) Drilling. (c) 45 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 varieties: \( V_1 = \text{R.S. 10}, V_2 = \text{Kabuli} \) and \( V_3 = \text{Local} \).
   Sub-plot treatments:
   All combinations of (1) and (2).
   (1) 3 levels of \( \text{P}_2\text{O}_5 \): \( P_0 = 0 \), \( P_1 = 16.8 \) and \( P_2 = 33.6 \) Kg/ha.
   (2) 2 levels of \( \text{N} \): \( N_0 = 0 \) and \( N_1 = 16.8 \) Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 10.1 m \( \times \) 5.0 m. (b) 9.6 m. \( \times \) 4.3 m. (v) 22 cm. \( \times \) 38 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960–1962 (Treatments modified from 1961). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 717 Kg/ha. (ii) (a) 230.4 Kg/ha. (b) 118.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>( V_1 )</th>
<th>( V_2 )</th>
<th>( V_3 )</th>
<th>( N_0 )</th>
<th>( N_1 )</th>
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</tr>
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<td>761</td>
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<td>( P_2 )</td>
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Crop: Gram (Rabi).  
Site: Govt. Agri. Farm, Borekhera.  
Ref: Rj. 61(104), 62(67).  
Type: 'MV'.
3. DESIGN:
(i) Split-plot (ii) (a) 3 main-plots/replication; 18 sub-plots/main-plots. (b) N.A. (iii) 2 for 61(104); 4 for 62(67). (iv) 4.9 m. x 3.1 m. for 61(104); 4.9 m. x 2.4 m. for 62(17). (v) 30 cm. x 30 cm. for 61(104) and 62(67). (vi) Yes.

4. GENERAL:
(i) Germination and growth affected by low temperatures and clouds for 61(104); N.A. for 62(67). (ii) White ant attack observed for 61(104); N.A. for 62(67). (iii) Yield of grain. (iv) 1960 to 1962. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS:
61(104)
(i) 1545 Kg/ha. (ii) (a) 52.8 Kg/ha. (b) 153.1 Kg/ha. (iii) Main effects of V, N and P are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>K2</th>
<th>K1</th>
<th>K3</th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
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</tr>
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C.D. for V marginal means = 53.4 Kg/ha.
C.D. for N marginal means = 59.3 Kg/ha.
C.D. for P marginal means = 72.6 Kg/ha.

62(67)
(i) 1374 Kg/ha. (ii) (a) 234.5 Kg/ha. (b) 254.7 Kg/ha. (iii) Main effects of V, N, P are highly significant. Interaction N x P is significant. (iv) Av. yield grain in Kg/ha.

<table>
<thead>
<tr>
<th>V1</th>
<th>V2</th>
<th>V3</th>
<th>K0</th>
<th>K1</th>
<th>K2</th>
<th>P0</th>
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</table>
Crop: Gram (Rabi).  

Site: Govt. Agri. Res. Farm, Sriganganagar.  

Object: To study the effect of different isolates of Rhizobia on the growth and yield of Gram.

1. BASAL CONDITIONS:
   - (i) (a) Nil. (b) Fallow. (c) Nil.  
   - (ii) Sandy loam.  
   - (iii) 14.11.63.  
   - (iv) (a) Ploughings.  
     - (b) Behind the plough.  
     - (c) 37 Kg/ha.  
     - (d) 30 cm. between rows.  
     - (e) N.A.  
   - (v) 22'4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.  
   - (vi) Local.  
   - (vii) Irrigated.  
   - (viii) 4 weedings.  
   - (ix) N.A.  
   - (x) 20.4.64.

2. TREATMENTS:
   - 6 seed culture treatments: T<sub>0</sub>=Control, T<sub>1</sub>=Rhizobium Kota, T<sub>2</sub>=Rhizobium Sriganganagar, T<sub>3</sub>=Rhizobium Ajmer, T<sub>4</sub>=Rhizobium Durgapura and T<sub>5</sub>=Rhizobium IARI.

3. DESIGN:
   - (i) B.I.B.D.  
   - (ii) (a) 2 plots/block; 15 blocks.  
     - (b) N.A.  
   - (iii) 5.  
   - (iv) (a) and (b) 7.3 m. x 5.5 m.  
   - (v) Nil.  
   - (vi) Yes.

4. GENERAL:
   - (i) Very good.  
   - (ii) Mild effect of rust.  
   - (iii) Yield of grain and fodder.  
   - (iv) (a) 1963 only.  
     - (b) No.  
     - (c) Nil.  
   - (v) Durgapura, Mandore, Sriganganagar and Kota.  
   - (vi) Heavy frost.  
   - (vii) Nil.

5. RESULTS:
   - (i) 2081 Kg/ha.  
   - (ii) 217'2 Kg/ha.  
   - (iii) Treatment differences are not significant.  
   - (iv) Av. yield of grain in Kg/ha.

<table>
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<th>T&lt;sub&gt;1&lt;/sub&gt;</th>
<th>T&lt;sub&gt;2&lt;/sub&gt;</th>
<th>T&lt;sub&gt;3&lt;/sub&gt;</th>
<th>T&lt;sub&gt;4&lt;/sub&gt;</th>
<th>T&lt;sub&gt;5&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
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<td>2287</td>
<td>2011</td>
<td>2119</td>
<td>2272</td>
<td>1936</td>
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</table>

Crop: Gram (Rabi).  

Site: Govt. Agri. Res. Farm, Sriganganagar.  

Object: To find out suitable variety and period of sowing for Gram under Rajasthan canal conditions.

1. BASAL CONDITIONS:
   - (i) (a) Nil.  
     - (b) Fallow.  
     - (c) Nil.  
   - (ii) Sandy loam.  
   - (iii) As per treatments.  
   - (iv) (a) 2 ploughings.  
     - (b) Drilling.  
   - (c) 37 Kg/ha.  
   - (d) 30 cm. between rows.  
   - (e) N.A.  
   - (v) N.A.  
   - (vi) As per treatments.  
   - (vii) Irrigated.  
   - (viii) 1 weeding.  
   - (ix) N.A.  
   - (x) 1, 9 and 17.4.63.

2. TREATMENTS:
   - Main-plot treatments:  
   - Sub-plot treatments:  
     - 3 varieties: V<sub>1</sub>=Kabuli, V<sub>2</sub>=R.S. 10 and V<sub>3</sub>=Local.

3. DESIGN:
   - (i) Split-plot.  
     - (ii) (a) main-plots/replication, 3 sub-plots/main-plot.  
     - (b) N.A.  
     - (iii) 4.  
     - (iv) (a) 9'2 m. x 4'0 m.  
     - (b) 8'4 m. x 3'4 m.  
     - (v) 41 cm. x 30 cm.  
     - (vi) Yes.
4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and Bhau. (iv) to (vii) N.A.

5. RESULTS:
(i) 2643 Kg/ha. (ii) (a) 1541·2 Kg/ha. (b) 859·7 Kg/ha. (iii) Main effect of D alone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>V1</th>
<th>V2</th>
<th>V3</th>
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<tr>
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</tr>
<tr>
<td>D3</td>
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<td>1869</td>
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</tr>
<tr>
<td>Mean</td>
<td>2174</td>
<td>3030</td>
<td>2726</td>
<td>2643</td>
</tr>
</tbody>
</table>

C.D. for D marginal means = 1539·4 Kg/ha.

Crop :- Gram (Rabi).
Site :- Govt. Agri. Res. Farm, Sriganganagar.
Object :- To study the effect of different dates of sowing, seed rates and levels of N and P on the yield of Gram.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. for 63(36); Fallow for 64(55). (c) N.A. for 63(36); Nil for 64(55). (ii) Sandy loam. (iii) As per treatments. (iv) (a) Ploughings with desi plough and tractor. (b) Drilling for 63(36); Behind the plough for 64(55). (c) As per treatments. (d) 30 cm. between rows. (e) N.A. (v) N.A. for 63(36); Nil for 64(55). (vi) R.S. 10. (vii) Irrigated. (viii) 2 weedings for 63(36); 2 hoeings for 64(55). (ix) N.A. for 63(36); 1 cm. for 64(55). (x) 8.4.1964; 30.3.1965 and 23.4.65.

2. TREATMENTS:
Main-plot treatments:
3 dates of sowing : D1 = 1st week of Oct., D2 = 3rd week of Oct. and D3 = 2nd week of November.
Sub-plot treatments:
3 seed rates : S1 = 37, S2 = 62 and S3 = 86 Kg/ha.
Sub-sub-plot treatments:
All combinations of (1) and (2)
(1) 2 levels of N : N0 = 0 and N1 = 37·1 Kg/ha.
(2) 3 levels of P2O5 : P0 = 0, P1 = 37·1 and P2 = 74·1 Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication ; 3 sub-plots/main-plot, 6 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) 5·5 m. x 3·7 m. (b) 4·9 m. x 3·1 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963 to 1964. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS:
63(36)
(i) 2021 Kg/ha. (ii) (a) 1155·0 Kg/ha. (b) 567·0 Kg/ha. (c) 439·0 Kg/ha. (iii) Main effect of P alone is highly significant. (iv) Av. yield of grain in Kg/ha.
Crop - Gram (Rabi).
Site - Govt. Agri. Res. Farm, Borkhera.
Object - To study the effect of different levels of P and different stages of topping on Gram varieties.
Ref - Rj. 61(91).
Type - 'CMV'.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Jowar. (c) Nil. (ii) Clay loam. (iii) 20.10.61. (iv) (a) 1 ploughing and 2 bakherings. (b) Drilling. (c) 56 Kg/ha. (d) 30 cm. between rows. (e) N.A. (f) N.A. (vi) As per treatments. (vii) Un-irrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS:
Main-plot treatments:
   (1) 3 stages of topping: T₀=Control (no topping), T₁=Topping after 40 days and T₂=Topping after 60 days.

<table>
<thead>
<tr>
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<th>D₂</th>
<th>D₃</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
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<td>2039</td>
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<td>1978</td>
<td>2011</td>
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<td>2021</td>
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C.D. for P marginal means = 208.7 Kg/ha.

64(55)
(i) 1292 Kg/ha. (ii) (a) 300.6 Kg/ha. (b) 232.2 Kg/ha. (c) 293.7 Kg/ha. (iii) Main effect of D alone is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>P₀</th>
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</table>

C.D. for D marginal means = 304.6 Kg/ha.
Sub-plot treatments:
All combinations of (1) and (2)
(1) 2 varieties of Gram : $V_1=$ Local and $V_2=$ R.S. 10.
(2) 4 levels of $P_2O_5$: $P_0=0$, $P_1=16.8$, $P_2=33.6$ and $P_3=50.4$ Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication, 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 7.5 m. x 5.5 m. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Low temperature and clouds affected the crop adversely. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961-1963 [design changed in 1962]. (b) No. (e) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 340 Kg/ha. (ii) (a) 60.7 Kg/ha. (b) 63.8 Kg/ha. (iii) Main effect of $P$ alone is significant. (iv) Av. yield of grain in Kg/ha.

<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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<th>$T_1$</th>
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<td>319</td>
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<td>343</td>
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<td>$V_2$</td>
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C.D. for P marginal means = 36.8 Kg/ha.

**Crop:** Gram *(Rabi)*

**Site:** Govt. Agri. Res. Farm, Borkhera

**Ref:** Rj. 62(58), 63(49).

**Type:** 'CMV'.

Object:—To find out the effect of different levels of phosphates in topping on different varieties of Gram.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) 13.10.1962; 15.10.1963. (iv) (a) 1 ploughing and 2 to 3 bakherings. (b) Drilling. (c) 67 to 74 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. for 62(58); Nil for 63(49). (vi) As per treatments. (vii) Unirrigated. (viii) 1 weeding for 62(58); Nil for other. (ix) N.A. for 62(58); 140 cm. for 63(49). (x) 8.3.1963: 24.3.1964.

2. TREATMENTS:
Main-plot treatments:
3 stages of topping: $T_0$=Control (no topping), $T_1$=Topping after 40 days and $T_2$=Topping after 60 days.

Sub-plot treatments:
2 varieties: $V_1$=Local and $V_2$=R.S. 10.

Sub-sub plot treatments:
4 levels of $P_2O_5$: $P_0=0$, $P_1=16.8$, $P_2=33.6$ and $P_3=50.4$ Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 2 sub-plots/main-plot; 4 sub-sub-plots/plot. (b) N.A.
(iii) 4. (iv) (a) 8.2 m. x 6.1 m. (b) 7.4 m. x 5.5 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of grain. (iv) (a) 1961-1963 [Design changed in 62]. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.
5. RESULTS:

62(58)

(i) 820 Kg/ha. (ii) (a) 280.7 Kg/ha. (b) 362.0 Kg/ha. (c) 832.7 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
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<th>P₂</th>
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</tbody>
</table>

63(49)

(i) 944 Kg/ha. (ii) (a) 99.7 Kg/ha. (b) 183.0 Kg/ha. (c) 132.0 Kg/ha. (iii) Main effect of P alone is highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
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<th>P₂</th>
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</tbody>
</table>

C.D. for P marginal means=76.5 Kg/ha.

---

**Crop**: Gram (*Rabi*).

**Site**: Govt. Agri. Res. Farm, Sriganganagar.

**Object**: To study the effect of different levels of P and irrigation on Gram.

**Ref**: Rj. 63(65).

**Type**: 'IM'.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (i) Sandy loam. (iii) 15.10.63. (iv) (a) Nil. (b) Drilling. (c) 56 Kg/ha. (d) 30 cm. between lines. (e) N.A. (v) Nil. (vi) R.S.-10. (vii) As per treatments. (viii) 2 weedings. (ix) N.A. (x) 27.3.64.

2. TREATMENTS:

**Main-plot treatments**:

7 irrigational treatments: I₀ = No irrigation, I₁ = One irrigation after 1/2 months, I₂ = 2 irrigations 1st after 1/2 and 2nd at flowering stage, I₃ = 3 irrigations 1st after 1/2 months, I₄ = 1 irrigation at flowering stage, I₅ = 1 irrigation at seed formation stage, I₆ = 2 irrigations 1st after 1½ months and 2nd at seed formation stage.

**Sub-plot treatments**:

3 levels of P₀O₅: P₀ = 0, P₁ = 37.1 and P₂ = 74.1 Kg/ha.
3. DESIGN:
   (i) Split-plot. (ii) 7 main-plots/repl. 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 5·5 m. x 4·6 m. (b) 4·3 m. x 3·4 m. (v) 61 cm. x 61 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1963-65 (modified in 1964). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1514 Kg/ha. (ii) (a) 276·0 Kg/ha. (b) 222·0 Kg/ha. (iii) Main effects of I and P are highly significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
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<th></th>
<th>Ia</th>
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<td>1631</td>
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<td>1751</td>
<td>1413</td>
<td>1895</td>
<td>943</td>
<td>1961</td>
</tr>
</tbody>
</table>

C.D. for I marginal means = 283·5 Kg/ha. C.D. for P marginal means = 140·3 Kg/ha.

---

_Crop_: Gram (Rabi).  
_Site_: Govt. Agri. Res. Farm, Sriganganagar.  
_Ref_: Rj. 64(53), 65(32).  
_Type_: 'IM'.

Object: To study the effect of irrigations and different levels of P on the yield of Gram.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 27.10.64; 27.10.65. (iv) (a) 1 to 2 ploughings. (b) Drilling for 64 (53); Behind the plough for 65 (32). (c) 37 Kg/ha. for 64 (53); 62 Kg/ha. for 65(32). (d) 30 cm. x 15 cm. (e) N.A. (v) 18·5 Kg/ha. of N. (vi) R.S.-10. (vii) As per treatments. (viii) 2 hand hoeings. (ix) N.A. (x) 8.4.65; 28.3.66.

2. TREATMENTS:
   Main-plot treatments:
   8 irrigational treatments: I1 = No irrigation, I2 = One irrigation after 45 days and the 2nd at flowering stage, I3 = One irrigation at flowering stage, I4 = One irrigation after 45 days at 2nd and flowering stage and 3rd at seed formation, I5 = One irrigation at seed formation, I6 = One irrigation after 45 days and 2nd at seed formation and I7 = One irrigation at flowering and 2nd at seed formation.

Sub-plot treatments:
   3 levels of P4O5 : P0 = 0, P1 = 37·1 and P2 = 74·1 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 8 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 5·5 m. x 3·7 m. for 64 (53); 5·5 m. x 5·5 m. for 65 (32). (b) 4·9 m. x 2·7 m. for 64 (53); 4·9 m. x 4·6 m. for 65(32). (v) 30 cm. x 46 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. for 64 (53); Nil for 65(32). (iii) Yield of grain. (iv) (a) 1963 to 1965 (modified in 64). (b) No. (c) Results of combined analysis are given under 5. (v) and (vi) Nil. (vii) Both the error variances are homogeneous and main and sub-plot Treatments x years interaction is absent.
5. RESULTS:

(i) 1444 Kg/ha.  (ii) (a) 338.6 Kg/ha. (based on 35 d.f. made up of Treatments x years interaction and pooled error).  (b) 299.5 Kg/ha. (based on 80 d.f. made up of various components of Treatments x years interaction and pooled error).  (iii) None of the effects is significant.  (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
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<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
<th>I₄</th>
<th>I₅</th>
<th>I₆</th>
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Crop :- Moth (Kharif).
Site :- Govt. Agri. Farm, Mandore.

Object :- To study the response of different levels of P and row spacings on the yield of different varieties of Moth.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) Sandy loam.  (iii) N.A.  (iv) (a) One summer ploughing and one ploughing at the time of sowing and 2 times cultivation.  (b) N.A.  (c) 11 Kg/ha.  (d) As per treatments.  (e) N.A.  (f) Nil.  (vi) As per treatments.  (vii) Unirrigated.  (viii) 1 weeding.  (ix) 20 cm.  (x) 21.10.64.

2. TREATMENTS:

Main-plot treatments:
- 3 spacings between rows: S₁ = 46 cm., S₂ = 61 cm and S₃ = 91 cm.

Sub-plot treatments:
- All combinations of (1) and (2).

(1) 3 levels of P₂O₅: P₀ = 0, P₁ = 22.4 and P₂ = 44.8 Kg/ha.
(2) 2 varieties: V₁ = B19-54 and V₂ = Local.

3. DESIGN:

(i) Split-plot.  (ii) (a) 3 main-plots/replication; 6 sub-plots/main-plot.  (b) N.A.  (iii) 2.  (iv) (a) and (b) 5.5 m. x 3.7 m.  (v) Nil.  (vi) Yes.

4. GENERAL:

(i) Good.  (ii) Nil.  (iii) Stand, height, no. of leaves, no. of branches and yield of grain and fodder.  (iv) 1964 only.  (b) No.  (c) N.A.  (v) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 112 Kg/ha.  (ii) (a) 40.2 Kg/ha. (b) 23.9 Kg/ha. (iii) Main effect of V alone is highly significant.  (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
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<th></th>
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<th>S₃</th>
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P₀  | 114 | 113 | 118 |
P₁  | 97  | 117 | 113 |
P₂  | 105 | 111 | 118 |

C.D. for V marginal means = 17.0 Kg/ha.
Crop :- Moong (Kharij).
Site :- Govt. Agri. Farm, Mandore.
Object — To study the effect of different levels of P on different varieties of Moong.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) N.A. (iv) (a) 2 ploughings and 2 cultivations at the time of sowing. (b) Dibbling. (c) 15 Kg/ha. (d) 61 cm. between rows. (e) 3. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 2 weedings. (ix) 20 cm. (x) 28.9.64.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 varieties of Moong : V₁=R.S. 4, V₂=China Moong and V₃=Local.
   (2) 4 levels of P₂O₅ : P₀=0, P₁=16·8, P₂=33·6 and P₃=50·4 Kg/ha.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 5·5 m. x 3·7 m. (b) 4·9 m. x 3·1 m. (v) 30 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Yield of grain and fodder : stand, height, no. of branches/plant, no. of leaves' plant. (iv) (a) 1964 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 181 Kg ha. (ii) 148·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<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>V₁</td>
<td>84</td>
<td>73</td>
<td>160</td>
<td>166</td>
<td>121</td>
</tr>
<tr>
<td>V₂</td>
<td>171</td>
<td>187</td>
<td>150</td>
<td>259</td>
<td>192</td>
</tr>
<tr>
<td>V₃</td>
<td>274</td>
<td>231</td>
<td>163</td>
<td>256</td>
<td>231</td>
</tr>
<tr>
<td>Mean</td>
<td>176</td>
<td>164</td>
<td>158</td>
<td>227</td>
<td>181</td>
</tr>
</tbody>
</table>
4. GENERAL:
(i) Normal. (ii) Hairy caterpillar, hand picking and dusting of D.D.T. (iii) Growth observations and yield of grain. (iv) (a) 1965—N.A. (b) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
(i) 267 kg/ha. (ii) (a) 389·2 Kg/ha, (b) 116·1 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>Mean</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$P_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$N_0$</td>
<td>244</td>
<td>374</td>
<td>182</td>
<td>267</td>
<td>231</td>
<td>260</td>
<td>309</td>
</tr>
<tr>
<td>$N_1$</td>
<td>268</td>
<td>307</td>
<td>194</td>
<td>257</td>
<td>231</td>
<td>269</td>
<td>270</td>
</tr>
<tr>
<td>$N_2$</td>
<td>219</td>
<td>333</td>
<td>280</td>
<td>277</td>
<td>261</td>
<td>312</td>
<td>252</td>
</tr>
<tr>
<td>Mean</td>
<td>244</td>
<td>338</td>
<td>219</td>
<td>267</td>
<td>243</td>
<td>280</td>
<td>277</td>
</tr>
</tbody>
</table>

Crop: Moong. (Kharif).
Site: Govt. Agrı. Farm, Bassi.
Object: To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Moong.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Moong. (c) Nil. (ii) 1 sandy. (iii) 9.7.60. (iv) (a) 4 ploughings. (b) Dibbling. (c) 4 Kg/ha. (d) 46 cm. between rows. (e) 1. (v) N.A. (vi) R.S—4. (vii) Unirrigated. (viii) Weeding and thinning. (ix) N.A. (x) 27.10.60.

2. TREATMENTS:
8 fungicidal treatments: $T_1$ Control, $T_2=3·8$ gm., of Agrosan G.N., $T_3=2·8$ gm. of ceresan, $T_4=2$ gm. of Tilles, $T_5=2$ gm. of Lunasan, $T_6=2$ gm. of Hervasan, $T_7=3$ gm. of Fernasan and $T_8=4$ gm. of sulphur.

Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) 6·1 m. x 1·8 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960—contd. (Treatments modified). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 513 Kg/ha. (ii) 113·4 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatment
$T_0$ $T_1$ $T_2$ $T_3$ $T_4$ $T_5$ $T_6$ $T_7$
Av. yield
242 309 326 364 326 305 356 280.

Ref: Rj. 60(6). Type: ‘D’.
Crop :- Moong. (Kharif).
Site :- Govt. Agri. Farm, Bassi.

Object :- To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Moong.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Fallow. (c) N.A. (ii) Sandy loam. (iii) 18.7.61. (iv) (a) 4 ploughings. (b) Dibbling. (c) 4 Kg/ha. (d) 46 cm. between rows. (e) I. (v) N.A. (vi) R.S—4. (vii) Unirrigated. (viii) Weeding and thinning. (ix) N.A. (x) 24.10'61.

2. TREATMENTS:
   8 fungicidal treatments: $T_0$=Control, $T_1$=3 gm. of Agrosan, $T_2$=2 gm. of cersan, $T_3$=2 gm. of Tillex, $T_4$=2 gm. of Lunasan, $T_5$=2 gm. of Hervasan, $T_6$=3 gm. of Thiram and $T_7$=4 gm. of sulphur.
   Treatments applied to per Kg. of seed as dressing.

3. DESIGN and 4. GENERAL:
   Same as in exp. no. 60(6) on page 237.

5. RESULTS:
   (i) 254 Kg/ha. (ii) 59·3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.
   Treatment. $T_0$ $T_1$ $T_2$ $T_3$ $T_4$ $T_5$ $T_6$ $T_7$
   Av. yield. 217 228 240 269 257 285 250 285

---

Crop :- Moong (Kharif).
Site :- Govt. Agri. Farm, Bassi.

Object :- To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Moong.

1. BASAL CONDITIONS:
   (i) (a) Fallow—Gram—Moong. (b) Gram. (c) Nil. (ii) Sandy loam. (iii) 22.7.62. (iv) (a) 3 ploughings. (b) Dibbling. (c) 4 Kg/ha. (d) 46 cm. x 30 cm. (e) H. (v) N.A. (vi) R.S—4. (vii) Unirrigated. (viii) Weeding and thinning. (ix) N.A. (x) 30.10'62.

2. TREATMENTS:
   8 fungicidal treatments: $T_0$=Control, $T_1$=3 gm. of Agrosan G.N. $T_2$=2 gm. of cersan, $T_3$=2 gm. of Tillex, $T_4$=2 gm. of Lunasan, $T_5$=2 gm. of Hervasan, $T_6$=3 gm. of Thiram and $T_7$=2 gm. of Beej powder.
   Treatments applied to per Kg. of seed as dressing.

3. DESIGN : and 4. GENERAL:
   Same as in exp. no. 60(6) on page 237.

5. RESULTS:
   (i) 1484 Kg/ha. (ii) 152·5 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.
   Treatment. $T_0$ $T_1$ $T_2$ $T_3$ $T_4$ $T_5$ $T_6$ $T_7$
   Av. yield. 1393 1473 1421 1508 1648 1386 1614 1430
   C.D.=178·6 Kg/ha.
Object:—To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Moong.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 2.9.63. (iv) (a) 4 ploughings. (b) Dibbling (c) 4 Kg/ha. (d) 46 cm x 23 cm. (e) I. (v) N.A. (vi) R.S.—4. (vii) Unirrigated. (viii) Thinnning (ix) N.A. (x) 1.11.63.

2. TREATMENTS:
   10 fungicidal treatments: T₀=Control, T₁=3 gm. of Agrosan G.N., T₂=2 gm. of Ceresan, T₃=2 gm. of Tillex, T₄=2 gm. of Lunasan, T₅=2 gm. of Hervasan, T₆=3 gm. of Thiram, T₇=4 gm. of Shell seed dresser, T₈=4 gm. of Tritisan and T₉=2 gm. of Beej Power.

   Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
   (i) Incomplete L. Sq. (ii) (a) 3 plots/block; 10 blocks/Sq. and 3 Squ. (b) N.A. (iii) 9. (iv) 4'6 m. x 2'7 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Germination % and yield of grain. (iv) (a) 1960—contd. (Design changed in 1963). (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. RESULTS:
   (i) 63'0 degree. (ii) 5'1 degree. (iii) Treatment differences are not significant. (iv) Av. percentage germination in degrees.

   Treatment. T₀ T₁ T₂ T₃ T₄ T₅ T₆ T₇ T₈ T₉
   Mean angle 67'1 63'3 64'3 65'2 64'2 63'5 59'9 61'7 61'5 58'7

Crop :- Moong (Kharif).
Site :- Govt. Agri. Farm, Bassi.
4. GENERAL:
   (i) Good. (ii) Nil. (iii) Germination % and grain yield. (iv) (a) 1960—contd. (treatments and design modified). (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Grain yield:
   (i) 945 Kg/ha. (ii) 172·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>810</td>
<td>1061</td>
<td>1016</td>
<td>920</td>
<td>911</td>
<td>1037</td>
<td>925</td>
<td>933</td>
<td>916</td>
<td></td>
</tr>
</tbody>
</table>

Germination analysis:
   (i) 43·6 degree. (ii) 3·8 degree. (iii) Treatment differences are not significant. (iv) Av. percentage germination in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>F₃</th>
<th>F₄</th>
<th>F₅</th>
<th>F₆</th>
<th>F₇</th>
<th>F₈</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean angle</td>
<td>44·4</td>
<td>44·8</td>
<td>44·4</td>
<td>38·3</td>
<td>42·6</td>
<td>45·5</td>
<td>45·4</td>
<td>42·9</td>
<td>43·4</td>
</tr>
</tbody>
</table>

_Crop:- Moong. (Kharif)._  
_Site:- Govt. Agri. Farm, Durgapura._  
_Ref:- Rj. 61(13).  
_Type:- 'D'.

Object:—To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Moong.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Barley. (c) Nil. (ii) Sandy. (iii) 12.7.61. (iv) (a) 4 ploughings. (b) Dibbling. (c) 4 Kg/ha. (d) 46 cm. x 30 cm. (e) 1. (v) N.A. (vi) R.S.—4. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) 15.10.61.

2. TREATMENTS:
   8 fungicidal treatments: T₀=Control, T₁=3 gm. of Agrosan G.N., T₂=2 gm. of Crescan, T₃=2 gm. of Tillex, T₄=2 gm. of Lunasan, T₅=2 gm. of Hervasan, T₆=3 gm. of Thiram and T₇=4 gm of sulphur.

Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 6·1 m. x 1·8 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1959 to 1961. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

Grain yield:
   (i) 158 Kg/ha. (ii) 41·2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>102</td>
<td>183</td>
<td>157</td>
<td>195</td>
<td>148</td>
<td>140</td>
<td>178</td>
<td>161</td>
</tr>
</tbody>
</table>

_C.D. =48·3 Kg/ha._
Crop :- Moong (Kharif).

Site :- Govt. Agri. Farm, Mandore.

Object :- To study the effect of different fungicides on the yield of Moong.

BASAL CONDITIONS:
(i) (a) Nil. (b) Bajra. (c) Nil. (ii) Sandy loam. (iii) 22.7.62. (iv) (a) 1 ploughing. (b) Dibbling. (c) 15 Kg/ha. (d) 46 cm x 30 cm. (e) 3. (v) N.A. (vi) Local. (vii) Unirrigated: (viii) 2. weedings. (ix) 30 cm. (x) 15:10.62.

2. TREATMENTS:
8 fungicidal treatments: $T_0$=Control, $T_1$=Agrosan G.N. at 3 gm., $T_2$=Ceresan at 2 gm., $T_3$=Tillex at 2 gm., $T_4$=Lunasan at 2 gm., $T_5$=Herasan at 3 Kg. and $T_6$=Beej powder at 2 gm.

Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
(i) R.B.D. (ii) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 6:1.m. x 8:1.m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Plant count and yield of Grain. (iv) (a) 1961—N.A. (b) No: (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1230 Kg/ha. (ii) 1964 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1282</td>
<td>1166</td>
<td>1178</td>
<td>1005</td>
<td>1323</td>
<td>1162</td>
<td>1450</td>
</tr>
<tr>
<td>C.D.</td>
<td>230</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Moong (Kharif).

Site :- Govt. Agri. Farm, Mandore.

Object :- To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Moong.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 8, 10, 11:8:1963; 29.7:1964. (iv) (a) 2 ploughings. (b) Dibbling. (c) N.A. (d) Between lines 46 cm. and between plants 23 cm. (e) 3. seeds/hole for 63 (116) and 1 seed/hole for 64 (103). (v) Nil. (vi) Local. (vii) Unirrigated. (viii) 1-2 weedings and 1 hoeing. (ix) N.A. (x) 23, 24.10.63; 19.10.64.

2. TREATMENTS:
10 Seed dressing Treatments:
$T_0$=Control.
$T_1$=Agrosan G.N at the rate of 2:8 gm./kg., $T_2$=Ceresan at the rate of 1:9 gm./kg., $T_3$=Tillex at the rate of 1:9 gm./kg., $T_4$=Lunasan at the rate of 1:9 gm./kg., $T_5$=Herasan at the rate of 1:9 gm./kg., $T_6$=Thiram at the rate of 4 gm./kg., $T_7$=Shell seed dresser at the rate of 4 gm./kg., $T_8$=Tritisan at the rate of 4 gm./kg., $T_9$=Beej powder at the rate of 2 gm./kg.

3. DESIGN:
(i) Incomplete. L Sq. (ii) (a) 3-plots/block; 10 blocks/ Sq. and 3 Sqs. (b) N.A. (iii) 9. (iv) (a) and (b) 4:6 m. x 2:7 m. (v) Nil. (vi) Yes.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 1962, (b) No, (c) Nil, (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments x years interaction is absent.

5. RESULTS:
(i) 278.3 Kg/ha. (ii) 56.8 Kg/ha, (based on 86 d.f. made up of pooled error) (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatments

<table>
<thead>
<tr>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
<th>T_8</th>
</tr>
</thead>
<tbody>
<tr>
<td>288.5</td>
<td>276.0</td>
<td>272.5</td>
<td>286.0</td>
<td>265.0</td>
<td>283.0</td>
<td>260.0</td>
<td>273.5</td>
</tr>
</tbody>
</table>

Av. yield

4. GENERAL:
(i) and (ii) Nil. (iii) Yield of grain. (iv) (a) 1961 to 1962. (b) No. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments x years interaction is absent.

3. RESULTS:
(i) 278.3 Kg/ha. (ii) 56.8 Kg/ha, (based on 86 d.f. made up of pooled error) (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

Treatments

<table>
<thead>
<tr>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
<th>T_8</th>
</tr>
</thead>
<tbody>
<tr>
<td>278.3</td>
<td>281.0</td>
<td>272.5</td>
<td>286.0</td>
<td>265.0</td>
<td>283.0</td>
<td>260.0</td>
<td>273.5</td>
</tr>
</tbody>
</table>

Av. yield

---

**Crop:** Moong (Kharif).

**Site:** Govt. Agri. Farm, Mandore.

**Ref:** Rj. 63(19), 64(3).

**Type:** 'D'.

Object:—To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Moong.

2. BASAL CONDITIONS:
(i) (a) N.A. for 61 (19); Bajra-Fallow-Moong. for 62 (3). (b) N.A. for 61 (19); Bajra for 62 (3). (c) N.A.
(ii) Sandy loam. (iii) 29.7.61; 22.7.62. (iv) (a) 1 ploughing. (b) Dibbling. (c) 15 Kg/ha. (d) 46 cm. x 30 cm. (e) 3. (v) N.A. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) 6.11.61; 15.10.62.

2. TREATMENTS:
8 fungicidal treatments: T_1 = Control; T_2 = 2 gm. of Agrosan, T_3 = 2 gm. of Ceresan; T_4 = 2 gm. of Tillex; T_5 = 2 gm. of Lumasan, T_6 = 2 gm. of Hervasan; T_7 = 3 gm. of Thiram and, T_8 = 2 gm. of Beej Powder.

Treatments applied to per kg of seed as dressing.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (’a) and (b) 6.1 m. x 1.8 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of gram. (iv) (a) 1961 to 1962. (b) No. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments x years interaction is absent.

5. RESULTS:
(i) 1076 Kg/ha. (ii) 219.5 Kg/ha, (based on 77 d.f. made up of pooled error and Treatments x years interaction). (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

Treatments

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
</tr>
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<tbody>
<tr>
<td>Av. yield</td>
<td>1087</td>
<td>992</td>
<td>1162</td>
<td>912</td>
<td>1148</td>
<td>1007</td>
<td>1238</td>
</tr>
</tbody>
</table>

C.D. = 178.3 Kg/ha.

---

**Crop:** Moong (Kharif).

**Site:** Govt. Agri. Farm, Mandore.

**Ref:** Rj. 63(72), 64(3).

**Type:** 'D'.

Object:—To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Moong.

1. BASAL CONDITIONS:
(ii) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 8, 10, 11.8.63; 29.7.64. (iv) (a) 2 ploughings. (b) Dibbling. (c) 15 Kg/ha. (d) 46 cm. x 23 cm. (e) 3 for 63 (72); 1 for 64 (3). (v) Nil. (vi) Local. (vii) Unirrigated. (viii) 2 hand weedings and thinning for 63 (72); 2 hand weedings and hoeing for 64 (3). (x) 23, 24.10.63 for 63 (72): 19.10.64 for 64 (3).
I. TREATMENTS:

10 fungicidal treatments: T₀ = 0, T₁ = 3 g/m² of Agroasan G; N₀, T₁ = 2 g/m² of Ceresan; T₂ = 2 g/m² of Tillex, T₃ = 2 g/m² of Lunāsant; T₄ = 2 g/m² of Hervasan; T₅ = 3 g/m² of Thiram; T₆ = 1 g/m² of shell seed dresser, T₇ = 1 g/m² of Tritsan and T₈ = 0.6 g/m² of Beej powder.

Treatments applied to per Kg of seed as dressing.

3. DESIGN:

(i) Incomplete L. Sq. (ii) (a) 3 plots/block; 10 blocks/sq., 3 Squares. (b) N.A. (iii) 9. (iv) (a) and (b) 4 x 6 m. x 2.7 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) N.A. for 63 (72); Good for 64 (3). (ii) N.A. for 63 (72); Nil for 64 (3). (iii) Germination % and yield of grain. (iv) (a) 1963 to 1964. (b) N.A. (v) Nil. (vi) Nil. (vii) Since the error variances are heterogeneous and Treatments x years interaction is absent, results of individual years are presented under 5 results.

5. RESULTS:

63(72)

Germination:

(i) 62·0 degrees. (ii) 4·7 degrees. (iii) Treatment differences are not significant. (iv) Av. germination in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀</td>
<td>60·4</td>
</tr>
<tr>
<td>T₁</td>
<td>63·6</td>
</tr>
<tr>
<td>T₂</td>
<td>63·7</td>
</tr>
<tr>
<td>T₃</td>
<td>61·5</td>
</tr>
<tr>
<td>T₄</td>
<td>59·9</td>
</tr>
<tr>
<td>T₅</td>
<td>62·8</td>
</tr>
<tr>
<td>T₆</td>
<td>63·5</td>
</tr>
<tr>
<td>T₇</td>
<td>59·7</td>
</tr>
<tr>
<td>T₈</td>
<td>62·8</td>
</tr>
<tr>
<td>T₉</td>
<td>61·7</td>
</tr>
</tbody>
</table>

64(3)

Germination:

(i) 57·8 degrees. (ii) 7·4 degrees. (iii) Treatment differences are not significant. (iv) Av. germination in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀</td>
<td>58·9</td>
</tr>
<tr>
<td>T₁</td>
<td>60·8</td>
</tr>
<tr>
<td>T₂</td>
<td>60·3</td>
</tr>
<tr>
<td>T₃</td>
<td>56·4</td>
</tr>
<tr>
<td>T₄</td>
<td>56·8</td>
</tr>
<tr>
<td>T₅</td>
<td>60·7</td>
</tr>
<tr>
<td>T₆</td>
<td>56·2</td>
</tr>
<tr>
<td>T₇</td>
<td>51·5</td>
</tr>
<tr>
<td>T₈</td>
<td>60·4</td>
</tr>
<tr>
<td>T₉</td>
<td>56·5</td>
</tr>
</tbody>
</table>

Yield:

(i) 268 Kg/ha. (ii) 65·8 Kg/ha. (iii) Treatment differences are not significant: (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀</td>
<td>269</td>
</tr>
<tr>
<td>T₁</td>
<td>281</td>
</tr>
<tr>
<td>T₂</td>
<td>249</td>
</tr>
<tr>
<td>T₃</td>
<td>296</td>
</tr>
<tr>
<td>T₄</td>
<td>273</td>
</tr>
<tr>
<td>T₅</td>
<td>286</td>
</tr>
<tr>
<td>T₆</td>
<td>245</td>
</tr>
<tr>
<td>T₇</td>
<td>249</td>
</tr>
<tr>
<td>T₈</td>
<td>254</td>
</tr>
<tr>
<td>T₉</td>
<td>273</td>
</tr>
</tbody>
</table>


Object: To study the effect of different methods of application of N and P on the yield of grain.

1. BASAL CONDITIONS:

(i) (a) No. (b) Cotton. (c) N.A. (ii) N.A; (iii) 12·7.65. (iv) (a) One disc ploughing. (b) Drilling. (c) N/A; (d) Between lines 30 cm; (e) N/A; (v) N.A. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and weedings. (ix) N.A. (x) 23·10·65.

2. TREATMENTS:

Main-plot treatments

3 methods of placements : M₁ = Broadcast, M₂ = Drilled below the seed and M₃ = Band placement.

Sub-plot treatments

All combinations of (1) and (2).

(1) 2 levels of N : N₀ = 0 and N₁ = 33.6 Kg/ha.

(2) 3 levels of P₂O₅ : P₀ = 0, P₁ = 33·6 and P₂ = 67·2 Kg/ha.
3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 3·7 m. x 4·0 m. (iv) 30 cm. x 30 cm. (v) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Stand, height, no. of branches and yield of grain. (iv) 1965-N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 997 Kg/ha. (ii) (a) 330'0 Kg/ha. (b) 261'0 Kg/ha. (iii) Main effects of N, P are significant and interaction  M x N x P is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>N_2</th>
<th>N_1</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_0</td>
<td>875</td>
<td>752</td>
<td>916</td>
<td>726</td>
<td>970</td>
<td>848</td>
</tr>
<tr>
<td>P_1</td>
<td>866</td>
<td>1012</td>
<td>1051</td>
<td>1003</td>
<td>950</td>
<td>976</td>
</tr>
<tr>
<td>P_2</td>
<td>877</td>
<td>1322</td>
<td>1250</td>
<td>939</td>
<td>1394</td>
<td>1166</td>
</tr>
<tr>
<td>Mean</td>
<td>873</td>
<td>1045</td>
<td>1072</td>
<td>889</td>
<td>1105</td>
<td>927</td>
</tr>
</tbody>
</table>

C.D. for N marginal means=145·0 Kg/ha.
C.D. for P marginal means=179·6 Kg/ha.

Crop := Urad.
Site := Govt. Agri. Res. Farm, Borkhera.
Object := To study the effect of different fungicides on the yield of Urad.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) Sandy loam. (iii) N.A. (iv) (a) Ploughing. (b) Dibbling. (c) 15 Kg ha. (d) 46 cm. between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 22.11.1961.

2. TREATMENTS:
8 fungicidal treatments: T_e := Control, T_1 := 3 gm. of Agrosan, T_2 := 2 gm. of Ceresan, T_3 := 2 gm. of Tillex, T_4 := 2 gm. of Lunasan, T_5 := 2 gm. of Hervasan, T_6 := 3 gm. of Thiram and T_7 := 4 gm. of Sulphur.

Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
(i) R.B.D. (ii) a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 6'1 m. x 1'8 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1960-1962 [Treatments are modified in 1962]. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Experiment for 1960 failed.

5. RESULTS:
(i) 145 Kg/ha. (ii) 86'1 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_e</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>135</td>
<td>109</td>
<td>157</td>
<td>141</td>
<td>140</td>
<td>231</td>
<td>101</td>
<td>146</td>
</tr>
</tbody>
</table>

Ref := Rj. 61(118). Type := ‘D’.
Crop :- Urad (Kharif).

Site :- Govt. Agri. Res. Farm, Borkhera.

Object :- To determine the relative efficiency of different fungicides on the yield of Urad.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Sandy loam. (iii) 28.7.62 (iv) (a) Ploughing. (b) Dibbling. (c) 15 Kg/ha. (d) 46 cm. x 30 cm. (e) N.A. (v) N.A. (vi) Local. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) 22.11.62.

2. TREATMENTS:
   8 fungicidal treatments: T₀ = Control, T₁ = Agrosan G.N. at 3 gm., T₂ = Ceresan at 2 gm., T₃ = Tillex at 2 gm., T₄ = Lunasan at 2 gm., T₅ = Hervasan at 2 gm., T₆ = Thiram at 3 gm. and T₇ = Beej powder at 2 gm.

   Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
   Same as in Expt. No. 61(118) on page 244.

5. RESULTS:
   (i) 664 Kg/ha. (ii) 352.5 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

   Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ | T₆ | T₇
   Av. yield | 591 | 568 | 657 | 759 | 707 | 732 | 794 | 502

   C.D. = 272.0 Kg/ha.

---

Crop :- Urad (Kharif).

Site :- Govt. Agri. Res. Farm, Sriganganagar.

Object :- To determine the relative efficiency of different fungicides on the yield of Urad.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Cotton. (c) 44.8 Kg/ha. of N. (ii) Sandy loam. (iii) 22.7.61. (iv) (a) 3 ploughings. (b) Dibbling. (c) 17 Kg/ha. (d) 46 cm. x 30 cm. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) December, 1961.

2. TREATMENTS:
   8 fungicidal treatments: T₀ = Control, T₁ = Agrosan G.N. at 3 gm., T₂ = Ceresan at 2 gm., T₃ = Tillex at 2 gm., T₄ = Lunasan at 2 gm., T₅ = Hervasan at 2 gm., T₆ = Thiram at 3 gm. and T₇ = Sulphur at 4 gm.

   Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 6·1 m. x 1·8 m. (v) Nii. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1961 to 1963. (b) No. (c) Nii. (v) to. (vii) N.A.

5. RESULTS:
   (i) 1225 Kg/ha. (ii) 232.2 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of grain in Kg/ha.

   Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ | T₆ | T₇
   Av. yield | 940 | 1195 | 1399 | 1263 | 1123 | 1254 | 1237 | 1390

   C.D. = 272.0 Kg/ha.
Crop :- Urad (Kharif).
Site :- Govt. Agri. Res. Farm, Sriganganagar.

Object :-To determine the relative efficacy of seed dressing fungicides on the yield of Urad.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Cotton. (c) 44.8 Kg/ha. of N. (ii) Sandy loam. (iii) 28.7.62. (iv) (a) 3 ploughings. (b) Dibbling. (c) 17 Kg/ha. (d) 46 cm. x 30 cm. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 2 hoeings and 2 weedings. (ix) N.A. (x) 4.12.62.

2. TREATMENTS :
   8 fungicidal treatments: T₀=Control, T₁=Agrosan G.N. at 3 gm., T₂=Ceresan at 2 gm., T₃=Tillex at 2 gm., T₄=Lunasan at 2 gm., T₅=Hervasan at 2 gm., T₆=Thiram at 3 gm. and T₇=Beej powder at 0.6 gm.
   Treatments applied to per Kg. of seed as dressing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 6.1 m. x 1.8 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Yield of grain and fodder. (iv) (a) 1961 to 1963. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 678 Kg/ha. (ii) 148.9 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of grain in Kg/ha.

   Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ | T₆ | T₇
Av. yield  | 534| 593| 839| 661| 613| 687| 661| 839
C.D.       | 174.5 Kg/ha.

Crop :- Urad (Kharif).
Site :- Govt. Agri. Res. Farm, Sriganganagar.

Object :-To determine the relative efficacy of different fungicides on the yield of Urad.

1. BASAL CONDITIONS :
   (i) (a) to (c) Nil. (ii) Sandy loam. (iii) 16.7.63. (iv) (a) Ploughings. (b) Dibbling. (c) 17 Kg/ha. (d) 46 cm. x 30 cm. (e) 3. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 1 hoeings and thinning. (ix) 7 em. (x) 16.17.10.63.

2. TREATMENTS :
   10 fungicidal treatments: T₀=Control, T₁=Agrosan G.N. at 3 gm., T₂=Ceresan at 2 gm., T₃=Tillex at 2 gm., T₄=Lunasan at 2 gm., T₅=Hervasan at 2 gm., T₆=Thiram at 3 gm., T₇=Shell seed dresser at 1 gm., T₈=Tritisan at 1 gm. and T₉=Beej powder No. 1 at 0.6 gm.
   Treatments applied 15 per Kg. of seed as dressing.

3. DESIGN:
   (i) Incomplete L. sq. (ii) (a) 3 plots/block, 10 blocks/sq. and 3 sqts. (b) N.A. (iii) 9. (iv) (a) and (b) 6.1 m. x 1.8 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Germination percentage and yield of grain. (iv) (a) 1951-1953 (modified). (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.
5. RESULTS:
(i) 61.94%. (ii) 6.54%. (iii) Treatment differences are highly significant. (iv) Av. germination of seed in percentage.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. percentage</td>
<td>67.5</td>
<td>69.4</td>
<td>70.5</td>
<td>64.2</td>
<td>59.6</td>
<td>64.5</td>
<td>43.7</td>
<td>50.7</td>
<td>67.2</td>
<td>62.2</td>
</tr>
<tr>
<td>C.D. = 6.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Urad (Kharij).
Site: Govt. Agri. Res. Farm, Sriganganagar.
Ref: Rj. 63(75).
Type: DM.

Object: To study the effect of Rhyzobia on the yield and growth of Urud with artificial inoculation.

1. BASAL CONDITIONS:
(i) (a) to (c) Nil. (ii) Sandy loam. (iii) 16.7.63. (iv) (a) Ploughing. (b) Dibbling. (c) 17 Kg/ha. (d) 46 cm. x 30 cm. (e) N.A. (v) Nil. (vi) N.A. (vii) Irrigated. (viii) 1 hoeing. (ix) 7 cm. (x) 26, 27.10.63.

2. TREATMENTS:
Main-plot treatments:
2 types of inoculation: T₅ = No inoculation and T₁ = Rhyzobia inoculation.

Sub-plot treatments:
3 manurial treatments: M₀ = Control, M₁ = 33.6 Kg/ha. of P₂O₅ as super and M₂ = 1.1 Kg/ha. of Sodium molybdate.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 7.3 m. x 5.5 m. (b) 5.5 m. x 9.7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1963 only. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. RESULTS:
(i) 1668 Kg/ha. (ii) (a) 172.0 Kg/ha. (b) 162.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>×M₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₀</td>
<td>1628</td>
<td>1800</td>
<td>1670</td>
<td>1699</td>
</tr>
<tr>
<td>T₁</td>
<td>1740</td>
<td>1672</td>
<td>1495</td>
<td>1636</td>
</tr>
<tr>
<td>Mean</td>
<td>1684</td>
<td>1736</td>
<td>1582</td>
<td>1667</td>
</tr>
</tbody>
</table>

Crop: Cow-pea (Kharij).
Site: Govt. Agri. Farm, Durgapura.
Ref: Rj. 63(74).
Type: CM.

Object: To study the effect of Rhyzobia on growth and yield of crop with artificial inoculation.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Barley. (c) N.A. (ii) Sandy. (iii) 30.7.63. (iv) (a) 5 ploughings. (b) to (e) N.A. (v) N.A. (vi) 9. (vii) Unirrigated. (viii) and (ix) N.A.: (x) 20.10.63.
2. TREATMENTS : and 3. DESIGN :
Same as in expt. no. Rj. 63(75) on page 247.

4. GENERAL :
(i) and (ii) N.A. (iii) No. of modules in the middle two row per Kg. plants and plant height. (iv) (a) 1963 only. (b) No. (c) N.A. (v) and (vi) N.A. (vii) Nil.

5. RESULTS :
(i) 571 modules/ten plants. (ii) (a) 5'29 modules/ten plants. (b) 11'5 modules/ten plants. (iii) None of the effects is significant. (iv) Av. No. of modules/ten plants,

<table>
<thead>
<tr>
<th></th>
<th>M 6</th>
<th>M 1</th>
<th>M 2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>551</td>
<td>584</td>
<td>569</td>
<td>568</td>
</tr>
<tr>
<td>T1</td>
<td>569</td>
<td>568</td>
<td>584</td>
<td>574</td>
</tr>
</tbody>
</table>

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Crop :- Potato (Rabi).
Site :- Govt. Agri. Res. Farm, Borkhera.

Ref :- Rj. 62(65), 63(41).
Type :- ‘M’.

Object :- To study the effects of fertilizers and sources of N on the yield of Potato.

1. BASAL CONDITIONS :
(i) (a) Wheat—Fallow—Potato for 62(65) ; Nil for other. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) 26.11.1962 ; 19.10.1963. (iv) (a) Cross ploughings, cross discs, pata for 62(65) ; 2 bakherings, 1 ploughing and planking for 63(41). (b) N.A. for 62(65) ; sowing on ridges for 63(41) (c) 7'4 Q/ha. for 62(65) ; 11'1 Q/ha. (d) 46 cm. between lines. (e) N.A. (vi) S. (vii) Irrigate I. (viii) 2 weedings with earthing. (ix) N.A. (x) Digging on 13 to 15.3.1964 for 62(65), 12 to 15.2.1964 for 63(41).

2. TREATMENTS :
Main-plot treatments :
3 manurial treatments:

\[ \text{M}_1 = 44'18 \text{ Kg/ha. of N} + 22'4 \text{ Kg/ha. of P}_2\text{O}_5 + 22'4 \text{ Kg/ha. of K}_2\text{O}, \text{M}_2 = 89'7 \text{ Kg/ha. of N} + 44'8 \text{ Kg/ha. of P}_2\text{O}_5 + 44'8 \text{ Kg/ha. of K}_2\text{O} \text{ and M}_3 = 134'5 \text{ Kg/ha. of N} + 67'2 \text{ Kg/ha. of P}_2\text{O}_5 + 67'2 \text{ Kg/ha. of K}_2\text{O}. \]

Sub-plot treatments :
7 sources of N : 

\[ S_1 = \text{Complete inorganic}, \quad S_2 = \text{F.Y.M.} + \frac{1}{4} \text{ inorganic}, \quad S_3 = \frac{1}{2} \text{ oil cake} + \frac{1}{4} \text{ inorganic}, \quad S_4 = \frac{1}{2} \text{ oil cake} + \frac{1}{4} \text{ F.Y.M.} + \frac{1}{4} \text{ inorganic}, \quad S_5 = \frac{1}{2} \text{ F.Y.M.} + \frac{3}{4} \text{ inorganic}, \quad S_6 = \frac{1}{2} \text{ oil cake} + \frac{3}{4} \text{ inorganic and S}_7 = \frac{1}{2} \text{ oil cake} + \frac{1}{4} \text{ F.Y.M.} + \frac{3}{4} \text{ inorganic.} \]

3. DESIGN :
(i) Split-plot. (ii) (a) 3 main-plots/replication ; 7 sub-plots/main-plot. (b) N.A. (iii) 2 for 62(65) ; 3 for 63(41). (iv) (a) N.A. for 62(65) ; 4'3 m. x 4'3 m. for 63(41). (b) 3'7 m. x 3'7 m. for 62(65) and 63(41). (v) N.A. for 62(65) ; 30 cm. x 30 cm. for other. (vi) Yes.

4. GENERAL :
(i) N.A. for 62(65); Normal for 63(41). (ii) N.A. for 62(65) ; Infected by late blight and controlled by spraying cupramar for 63(41). (iii) Yield of potato. (iv) (a) 1962—1963. (b) No. (c) Nil. (vi) N.A. for 62(65); Light effect of frost for 63(41). (vii) Since the sub-plot error variances are heterogeneous results of individual years are presented under 5. Results.

5. RESULTS :
62(65).

(i) 259·2 Q/ha. (ii) (a) 41·2 Q/ha. (b) 51·7 Q/ha. (iii) Main effects of S is highly significant and that of M is significant. (iv) Av. yield of potato in Q/ha.
Crop: Potato (Rabi).  
Site: Govt. Agri. Farm, Durgapura.  
Ref: Rj. 60(49).  
Type: ‘M’.

Object: To study the effect of N, P and K on the yield of Potato.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Bajra. (c) Nil. (ii) Sandy loam. (iii) 6.11.10. (iv) (a) 2 ploughings. (b) N.A. (c) 9:12 to 13 8 Q/ha. (d) 61 cm. x 23 cm. (e) N.A. (v) N.A. (vi) Phulva. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 21 to 25.3.61.

2. TREATMENTS:
   All combinations of (1), (2) and (3).
   (1) 3 levels of N as A/S: \( N_0 = 0, N_1 = 50.4 \) and \( N_2 = 100.9 \) Kg/ha.
   (2) 3 levels of \( P_2O_5 \) as Super: \( P_0 = 0, P_1 = 50.4 \) and \( P_2 = 100.9 \) Kg/ha.
   (3) 3 levels of \( K_2O \) as Mur. Pot.: \( K_0 = 0, K_1 = 5.4 \) and \( K_2 = 100.9 \) Kg/ha.

3. DESIGN:
   (i) 3\(^2\) Factorial. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9:5 m. x 4:3 m. (b) 8-9 m. x 3:1 m. (v) 61 cm. x 30 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of potato. (iv) (a) 1960—N.A. (b) and (c) N.A. (v) and (vi) N.A. (vii) The plants were frozen due to cold.

5. RESULTS:
   (i) 186:3 Q/ha. (ii) 11:7 Q/ha. (iii) Main effect of N alone is highly significant. (vi) Av. yield of potato in Q/ha.

---

<table>
<thead>
<tr>
<th>M(_1)</th>
<th>S(_1)</th>
<th>S(_2)</th>
<th>S(_3)</th>
<th>S(_4)</th>
<th>S(_5)</th>
<th>S(_6)</th>
<th>S(_7)</th>
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<td></td>
</tr>
</tbody>
</table>

C.D. for M marginal means = 67:1 Q/ha.
C.D. for two S means at the same level of M = 23:8 Q/ha.
C.D. for two M means at the same level of S = 24:7 Q/ha.
Crop :- Potato (Rabi).
Site :- Govt. Agri. Farm, Durgapura.

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

1. BASAL CONDITIONS :
   (i) (a) Maize-Potato. (b) Fallow. (c) N.A. (ii) N.A. (iii) Nov., 60. (iv) (a) 3 ploughings. (b) N.A. (c) N.A. (d) Row to row 61 cm. (e) N.A. (v) N.A. (vi) Phulwa. (vii) Irrigated. (viii) and (ix) N.A. (x) March, 61.

2. TREATMENTS :
   All combinations of (1) and (2) with a control
   (1) 2 levels of N : N₁=50'4 and N₂=100'9 Kg/ha.
   (2) 4 sources of N : S₁=A/S, S₂=Cake and A/S in 1 : 1 ratio, S₃=Cake and A/S in 1 : 2 ratio and S₄=Cake and A/S in 1 : 3 ratio.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) 9. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 8'0 m. x 4'9 m. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Yield of Potato. (iv) to (vii) N.A.

5. RESULTS :
   (i) 79'5 Q/ha. (ii) 21'1 Q/ha. (iii) Main effect of N and ‘control vs. others’ are highly significant. (iv) Av. yield of Potato in Q/ha.

Control=34'5 Q/ha.

<table>
<thead>
<tr>
<th></th>
<th>( P₁ )</th>
<th>( P₂ )</th>
<th>( K₀ )</th>
<th>( K₁ )</th>
<th>( K₂ )</th>
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<td>( N₀ )</td>
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<td>22'6</td>
<td>20'1</td>
<td>20'5</td>
<td>21'7</td>
<td>24'1</td>
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<td>( N₁ )</td>
<td>52'0</td>
<td>48'4</td>
<td>50'5</td>
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<td>46'5</td>
<td>53'1</td>
</tr>
<tr>
<td>( N₂ )</td>
<td>69'4</td>
<td>72'1</td>
<td>64'1</td>
<td>65'8</td>
<td>73'7</td>
<td>66'2</td>
</tr>
<tr>
<td>Mean</td>
<td>48'4</td>
<td>47'7</td>
<td>44'9</td>
<td>45'8</td>
<td>47'3</td>
<td>47'8</td>
</tr>
<tr>
<td>( K₀ )</td>
<td>47'2</td>
<td>46'0</td>
<td>44'3</td>
<td>45'2</td>
<td>46'0</td>
<td>44'3</td>
</tr>
<tr>
<td>( K₁ )</td>
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<td>50'0</td>
<td>41'5</td>
<td>50'4</td>
<td>50'0</td>
<td>41'5</td>
</tr>
<tr>
<td>( K₂ )</td>
<td>47'6</td>
<td>47'1</td>
<td>48'8</td>
<td>47'6</td>
<td>47'1</td>
<td>48'8</td>
</tr>
</tbody>
</table>

C.D. for N marginal mean=6'74 Q/ha.
Crop: Potato.  
Ref: Rj. 60(1).  
Site: Govt. Seed Multiplication Farm, Sardar Garh.  
Type: 'M'.

Object: To study the effect of F.Y.M. and different levels and sources of N on the yield of Potato.

1. BASAL CONDITIONS:  
(i) (a) to (c) Nil, (ii) Loamy. (iii) 16.1.60.  (iv) (a) 4 ploughings. (b) N.A. (c) 11'1 Q/ha. (d) Row to row 46 cm. (e) N.A. (v) N.A. (vi) Shimla. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 18.5.60.

2. TREATMENTS:  
All combinations of (1) and (2) with 2 extra treatments  
(1) 2 levels of N: N\(_1\) = 50'4 and N\(_2\) = 100'9 Kg/ha.  
(2) 3 sources of N: S\(_1\) = G.N. (De-oiled), S\(_2\) = G.N. (expeller) and S\(_3\) = A/S.  
Extra treatments are: E\(_0\) = Control and E\(_1\) = 5604 Kg/ha. of F.Y.M.  
5604 Kg/ha. of F.Y.M. applied in all the treatment combinations except control plot.

3. DESIGN:  
(i) Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) 8'3 m. x 4'9 m. (b) 7'4 m. x 3'7 m. (v) 61 cm. x 46 cm. (vi) Yes.

4. GENERAL:  
(i) Good. (ii) No. (iii) Yield of Potato.  (iv) (a) 1960 N.A. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:  
(i) 33'2 Q/ha.  (ii) 10'15 Q/ha.  (iii) 'Control vs. others' alone is significant.  (iv) Av. yield of Potato in Q/ha.

\[ E_0 = 20'9 \text{ and } E_1 = 27'2 \text{ Q/ha.} \]

<table>
<thead>
<tr>
<th></th>
<th>S(_1)</th>
<th>S(_2)</th>
<th>S(_3)</th>
<th>Mean</th>
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<tbody>
<tr>
<td>N(_1)</td>
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<td>39'3</td>
<td>36'2</td>
<td>37'4</td>
</tr>
<tr>
<td>N(_2)</td>
<td>42'6</td>
<td>30'8</td>
<td>32'3</td>
<td>35'0</td>
</tr>
<tr>
<td>Mean</td>
<td>35'7</td>
<td>35'0</td>
<td>34'2</td>
<td>36'3</td>
</tr>
</tbody>
</table>

C.D. for 'Control vs. others' = 13'5 Kg/ha.

---

Crop: Potato (Rabi).  
Ref: Rj. 60(65), 61(87).  
Site: Govt. Agri. Farm, Sewar.  
Type: 'M'.

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

1. BASAL CONDITIONS:  
(i) (a) Fallow-Potato for 60(65); N.A. for 61(87). (b) Fallow. (c) Nil, (ii) N.A. (iii) Oct., 1960; 14.11.1961.  
(iv) (a) 3 to 4 ploughings. (b) and (c) N.A. (d) 61 cm. between rows. (e) N.A. (v) N.A. for 60(65); 50'4 Kg/ha. of each of P\(_2\)O\(_5\) and K\(_2\)O for 61(87)  
(vi) Phulwa. (vii) Irrigated. (viii) N.A. for 60(65); 2 weedings for other. (ix) N.A. (x) March, 1961; 18.4.1962.

2. TREATMENTS:  
All combinations of (1) and (2) with a control  
(1) 4 sources of N: S\(_1\) = A/S, S\(_2\) = Cake and A/S in 1 : 1, S\(_3\) = Cake and A/S in 1 : 2 ratio, S\(_4\) = Cake and A/S in 1 : 3 ratio.  
(2) 2 levels of N: N\(_1\) = 50'4 and N\(_2\) = 100'9 Kg/ha.
3. DESIGN:
(i) Fact. in R.B.D. (ii) N.A. (iii) 4. (iv) (a) N.A. for 60(65); 8·9 m. x 6'1 m. for 61(87). (b) 8·0 m. x 4·9 m. for 60(65) and 61(87). (v) N.A. for 60(65); 46 cm. x 61 cm. for 61(87). (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of tuber. (iv) (a) 1960 to 1961. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) Since error variances are heterogeneous and the Treatments x years interaction is absent. Results of individual years are presented under 5. Results.

5. RESULTS:
60(65)
(i) 186'1 Q/ha. (ii) 45'8 Q/ha. (iii) 'Control vs. others' effect alone is significant. (iv) Av. yield of Potato in Q/ha.

\[
\begin{array}{cccc|c}
\text{S} & S & S & S & \text{Mean} \\
N_1 & 180'8 & 175'5 & 198'0 & 201'1 & 188'9 \\
N_2 & 204'1 & 200'6 & 202'2 & 185'7 & 198'1 \\
\hline
\text{Mean} & 192'4 & 188'0 & 200'1 & 193'4 & 193'5 \\
\end{array}
\]

C.D. for 'control vs. others' = 30'3 Q/ha.

61(87)
(i) 126'0 Q/ha. (ii) 29'8 Q/ha. (iii) Main effect of S alone is significant. (iv) Av. yield of Potato in Q/ha.

\[
\begin{array}{cccc|c}
\text{S} & S & S & S & \text{Mean} \\
N_1 & 129'1 & 115'4 & 112'0 & 143'3 & 122'4 \\
N_2 & 145'5 & 114'4 & 123'5 & 165'0 & 136'8 \\
\hline
\text{Mean} & 139'3 & 114'9 & 112'7 & 151'6 & 129'6 \\
\end{array}
\]

C.D. for S marginal means = 30'7 Q/ha.

---

Crop :- Potato (Rabi).

Site :- Govt. Agri. Res. Farm, Borkhara.

Object :- To study the effect of insecticidal spraying on the incidence of pests and virus transmitting of Potato.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) G.M. for 63(95); Fallow for 64(40). (c) 33'6 Kg/ha. of P\textsubscript{2}O\textsubscript{5} for 63(95); Nil for other. (ii) Clay loam. (iii) 30, 31.10. N\textsubscript{63}; 12, 13.11.1964. (iv) (a) N.A. (b) Dibbling. (c) 8 Q/ha. (d) 61 cm. x 23 cm. (e) 1. (v) 89'7 Kg/ha. of N + 44'8 Kg/ha. of P\textsubscript{2}O\textsubscript{5} + 44'8 Kg/ha. of K\textsubscript{2}O for 63(95); 44'8 Kg/ha. of N + 44'8 Kg/ha. of P\textsubscript{2}O\textsubscript{5} + 44'8 Kg/ha. of K\textsubscript{2}O by drilling along the rows for 64(40). (vi) Nil. (vii) Irrigated. (viii) Hand weedings, hoeing and earthing. (ix) N.A. for 63(95); Nil for 64(40). (x) 6.2.1964, 10.3.1365.

Ref :- Rj. 63(95), 64(40).
TREATMENTS:

7 insecticidal treatments: $T_0 =$ Control, $T_1 = 2$ sprays of Endrin 0·02%, $T_2 = 3$ sprays of Endrin 0·02%, $T_3 = 2$ dusting of sevin at 44·8 Kg/ha., $T_4 = 3$ dusting of sevin at 44·8 Kg/ha., $T_5 = 2$ sprays of B.H.C. 0·3% and $T_6 = 3$ sprays of B.H.C. 0·3%.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) and (b) 6·4 m. x 4·3 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Incidence of pests and control measures as per treatments. (iii) Yield of tuber. (iv) (a) 1963 to 1964. (b) No. (c) Nil. (v) Nil. (vi) A cold wave and heavy frost in the month of January for 1963/64; Nil for other. (vii) Since error variances are heterogeneous and Treatments x years interaction is absent, results of individual years are presented under 5. Results.

5. RESULTS:

63(95)

(i) 64·9 Q/ha. (ii) 6·2 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of potato in Q/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>64·4</td>
<td>65·0</td>
<td>66·4</td>
<td>59·0</td>
<td>68·2</td>
<td>63·6</td>
</tr>
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</table>

64(40)

(i) 117·1 Q/ha. (ii) 10·5 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of potato in Q/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>109·8</td>
<td>115·8</td>
<td>119·0</td>
<td>116·2</td>
<td>119·4</td>
<td>112·6</td>
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</table>

Crop :- Carrot (Rabi).


Object :- To study the response of Carrot to different doses of N and P alone and in combination.

1. BASAL CONDITIONS:

(i) (a) Fallow-Carrot. (b) Bajra in last year. (c) Nil. (ii) Sandy loam. (iii) 6·10·60. (iv) (a) 4 ploughings. (b) Broadcast. (c) 11 Kg/ha. (d) and (e) Nil. (v) 56·0 Kg/ha. of N. (vi) Local. (vii) 8 Irrigated. (viii) 1 weeding. (ix) Nil. (x) 6·3.61.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 3 levels of N : $N_0 = 0, N_1 = 22·4$ and $N_2 = 44·8$ Kg/ha.

(2) 4 levels of $P_2O_5$ : $P_0 = 0, P_1 = 33·6, P_2 = 67·2$ and $P_3 = 100·9$ Kg/ha.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 4·6 m. x 3·7 m. (b) 4·0 m. x 3·1 m. (v) 46 cm. x 30 cm. (vi) Yes.

4. GENERAL:

(i) and (ii) Nil. (iii) Yield of the roots and foliage. (iv) (a) 1960 only. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

1. Roots.

(i) 446 Q/ha. (ii) 118·1 Q/ha. (iii) Main effect of N and interaction N x P are significant. (iv) Av. yield of roots in Q/ha.
<table>
<thead>
<tr>
<th></th>
<th>$P_1$</th>
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<th>$P_4$</th>
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<td>419</td>
<td>357</td>
<td>461</td>
</tr>
<tr>
<td>$N_1$</td>
<td>565</td>
<td>396</td>
<td>445</td>
<td>583</td>
<td>497</td>
</tr>
<tr>
<td>$N_2$</td>
<td>396</td>
<td>317</td>
<td>431</td>
<td>380</td>
<td>381</td>
</tr>
<tr>
<td>Mean</td>
<td>477</td>
<td>437</td>
<td>432</td>
<td>440</td>
<td>446</td>
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</tbody>
</table>

C.D. for $N$ marginal means = 84.9 Q/ha.
C.D. for means in the body of $N \times P$ table = 70.0 Q/ha.

2. Foliage.
(i) 734 Q/ha.  (ii) 120.3 Q/ha.  (iii) None of the effects is significant.  (iv) Av. yield of foliage in Q/ha.

<table>
<thead>
<tr>
<th></th>
<th>$P_1$</th>
<th>$P_2$</th>
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<td>722</td>
<td>758</td>
<td>728</td>
<td>734</td>
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**Crop:** Brinjal (*Rahi*).
**Site:** Govt. Nursery, Sriganganagar.

Object: To study the effect of insecticidal spraying on the control of Brinjal.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) and (c) N.A.  (ii) Sandy loam.  (iii) 11.7.64.  (iv) (a) 2 ploughings.  (b) Dibbling.  (c) N.A.  (d) 61 cm. x 61 cm.  (e) 2.  (v) N.A.  (vi) Local.  (vii) Irrigated.  (viii) 3 hoeings.  (ix) N.A.  (x) Pluckings on 17, 27.11.64 and 15.12.64.

2. TREATMENTS:
5 insecticidal sprayings: $T_0$ = Control, $T_1$ = Endrin E.C. 0.5%, $T_2$ = Sevin W.P. 0.2%, $T_3$ = Telodrin E.C. 0.03% and $T_4$ = B.H.C.+D.D.T. (1:1) W.P. 0.3%.

3. DESIGN:
(i) R.B.D.  (ii) (a) 5.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 3.7 m. x 2.4 m.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) Normal.  (ii) Incidence of pests and control measures as per treatments.  (iii) Yield of Brinjal.  (iv) (a) 1962 only.  (b) No.  (c) N.A.  (v) Nil.  (vi) Frost appeared.  (vii) Nil.

5. RESULTS:
(i) 4139 Kg/ha.  (ii) 1834 Kg/ha.  (iii) Treatment differences are not significant.  (iv) Av. yield of Brinjal in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
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<td>3976</td>
<td>4384</td>
<td>4373</td>
<td>4575</td>
</tr>
</tbody>
</table>
Crop: Pea (Rabi).
Ref: Rj. 63(17), 64(80), 65(39).
Site: Govt. Agri. Res. Farm, Sriganganagar. Type: 'M'.

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

BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow for 63 (17), 64 (80); Cotton for 65 (39). (c) Nil for 63 (17), 64 (80); N.A. for 65(39). (ii) Sandy loam. (iii) 20.11.63; 20.11'; 18.11.65. (iv) (a) 5 ploughings for 63 (17); 2 cultivations with tractor and 2 ploughings with bullocks for 64 (80); ploughings and planking for 65 (39). (b) line sowing (c) 17 Kg/ha. (d) 61 cm. x 8 cm. for 63 (17); 61 cm. x 23 cm. for others. (e) N.A. (v) Nil. (vi) N.P. -29 for 63 (17), 64 (80); Bonavella for 65 (39). (vii) Irrigated. (viii) 2 to 5 hoeings and weedings. (ix) N.A.; 1 cm.; N.A. (x) 10.4.1964; 15.4.65; 8.4.1966.

1. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N as A/S: No=O, N1=22.4 and N2=33.6 Kg/ha.
(2) 3 levels of P2O5 as Super: P0=0, P1=22.4 and P2=44.8 Kg/ha.
Levels of P2O5 tried in 64 (80) are P0=0, P1=22.4 and P2=33.6 Kg/ha.
Fertilizers were applied before sowing, N broadcast and P2O5 drilled for 64 (80).

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 3. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. for 63 (17), 64 (80); 6.5 m. x 4.3 m. for 65 (39). (v) 91 cm. x 91 cm. for 63 (17), 64 (80); 122 cm. x 61 cm. for 65 (39). (vi) Yes.

4. GENERAL:
(i) Poor for 63 (17); Normal for others. (ii) B.H.C. was applied before sowing for 63 (17); Nil for 64 (80); 0.02% solution of Aldrin was sprayed for 65 (39). (iii) Yield of pea. (iv) (a) 1963 to 1965 (treatments modified in 64). (b) No. (c) Nil. (v) and (vi) Nil. (vii) Expt. no. 63 (17) and 65 (39) have been pooled. Error variances are heterogeneous and Treatments x years interaction is present.

5. RESULTS:
64(80)
(i) 725 Kg/ha. (ii) 217.1 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of pea in Kg/ha.

|       | P0  | P1  | P2  | Mean 
|-------|-----|-----|-----|------
| N0    | 456 | 513 | 678 | 531 |
| N1    | 764 | 703 | 925 | 797 |
| N2    | 727 | 974 | 777 | 826 |
| Mean  | 649 | 732 | 793 | 725 |

C.D. for N marginal means=217.1 Kg/ha.

Combined results of 63 (17) and 65 (39)
(i) 927 Kg/ha. (ii) 447.7 Kg/ha. (8 d. f. made up of interaction of Treatments with years.) (iii) Main effect of N alone is significant. (iv) Av. yield of pea in Kg/ha.

|       | P0  | P1  | P2  | Mean 
|-------|-----|-----|-----|------
| N0    | 459 | 754 | 549 | 654 |
| N1    | 710 | 1035| 1204| 983 |
| N2    | 809 | 1226| 1397| 1144 |
| Mean  | 726 | 1005| 1050| 927 |

C.D. for N marginal means=344.1 Kg/ha.
Crop :- Pea (Rah).  
Site :- Govt. Agri. Res. Farm, Borkhera.  
Ref :- Rj. 63(86).  
Type :- ‘C’.

Object :- To study the effect of different isolates of Rhizobia on the growth and yield of Pea.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Jowar.  (c) N.A.  (ii) Clay loam.  (iii) 4.12.63.  (iv) (a) 2 ploughings.  (b) Behind the plough.  (c) 35 Kg/ha.  (d) 46 cm. x 15 cm.  (e) N.A.  (v) N.A.  (vi) N.P.  (vii) N.A.  (viii) 1 weeding and 1 earthing up.  (ix) N.A.  (x) 1.4.64.

2. TREATMENTS:
   7 seed culture treatments:  
   $T_0$ = Control, $T_1$ = Rhizobium Kota, $T_2$ = Rhizobium Sriganganagar, $T_3$ = Rhizobium Ajmer, $T_4$ = Rhizobium Durgapur, $T_5$ = Rhizobium I.A.R.I. and $T_6$ = Rhizobium Udaipur.

3. DESIGN:
   (i) Youden Sq.  (ii) 3 plots/block, 7 blocks/sq., 2 sqs.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 4.6 m. x 3.7 m.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A.  (iii) Grain yield.  (iv) (a) and (b) 1963 only.  (c) Nil.  (v) Sriganganagar, Mandore and Durgapur.  (vi) N.A.  (vii) Nil.

5. RESULTS:
   (i) 875 Kg/ha.  (ii) 382 Kg/ha.  (iii) Treatment differences are not significant.  (iv) Av. yield of pea in Kg/ha.
   
   Treatment  
   $T_0$  $T_1$  $T_2$  $T_3$  $T_4$  $T_5$  $T_6$  
   Av. yield 892 803 638 983 951 813 1048

Crop :- Pea (Rabi).  
Site :- Govt. Agri. Farm, Durgapur.  
Ref :- Rj. 65(23).  
Type :- ‘C’.

Object :- To study the effect of different mulching materials on the growth and yield of Pea.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Moong.  (c) N.A.  (ii) Sandy soils.  (iii) 23.10.65.  (iv) (a) Dist ploughing and harrowing.  (b) Behind the plough.  (c) 40 Kg/ha.  (d) 45 cm. x 15 cm.  (e) N.A.  (v) N.A.  (vi) Bonivilla.  (vii) Irrigated.  (viii) 3 weedings.  (ix) N.A.  (x) 2.3.1966.

2. TREATMENTS:
   8 cultural treatments:  
   $T_0$ = Control (cultivators practice), $T_1$ = Well decomposed cowdilng, $T_2$ = Staw of wheat of Karbi, $T_3$ = Allkathene sheet, $T_4$ = Handhoe after each irrigation, $T_5$ = ENCAP, $T_6$ = Oil emulsion and $T_7$ = Foliage of wild weeds.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 8.  (b) N.A.  (iii) 6.  (iv) (a) 4.5 m. x 2.3 m.  (b) 3.5 m. x 1.3 m.  (v) 50 cm. x 50 cm.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) Nil.  (iii) Yield of grain.  (iv) (a) 1965-contd.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:
   (i) 3024 Kg/ha.  (ii) 1234.5 Kg/ha.  (iii) Treatment differences are not significant.  (iv) Av. yield of pea in Kg/ha.
Crop: Pea (Rabi).
Site: Govt. Agri. Farm, Durgapura.
Ref: Rj. 63(87).
Type: 'C'.

Object: To study the effect of different isolates of rhizobia on the growth and yield of Pea.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Ground nut, Guar and Cowpea. (c) N.A. (ii) Sandy loam. (iii) 26.11.63. (iv) (a) 2 ploughings and 2 plankings. (b) Behind the plough. (c) 30 Kg/ha. (d) 46 cm. x 23 cm. (e) N.A. (v) 33.6 Kg/ha. of P₂O₅. (vi) NP-29. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 2.4.64.

2. TREATMENTS:
   7 seed culture treatments: T₀=Control, T₁=Rhyzobium Kota, T₂=Rhyzobium Sriganganagar, T₃=Rhyzobium Mandore, T₄=Rhyzobium Durgapura, T₅=Rhyzobium I.A.R.I. and T₆=Rhyzobium Udaipur.

3. DESIGN:
   (i) Youden sq. (ii) (a) 3 plots/block; 7 blocks/sq., 2 sqs. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 7.3 m. x 5.5 m. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Av. height of plants and yield of pea. (iv) (a) 1963 only. (b) No. (c) Nil. (v) Sriganganagar, Borkhera and Mandore. (vi) Heavy attack of frost. (vii) Nil.

5. RESULTS:
   (i) 1160 Kg/ha. (ii) 116.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
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<tr>
<td>Av. yield</td>
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<td>1110</td>
<td>1092</td>
<td>1194</td>
<td>1302</td>
<td>1165</td>
<td>1102</td>
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Crop: Pea (Rabi).
Site: Govt. Agri. Res. Farm, Sriganganagar.
Ref: Rj. 63(78).
Type: 'C'.

Object: To study the effect of different isolates of rhizobia on the growth and yield of Pea.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 14.11.63. (iv) (a) N.A. (b) Behind the plough. (c) 22 Kg/ha. (d) 61 cm. between rows. (e) N.A. (v) 22.4 Kg/ha. of N. (vi) T-19. (vii) Irrigated. (viii) 4 weedings. (ix) N.A. (x) 8.4.64.

2. TREATMENTS:
   7 seed culture treatments: T₀=Control (local), T₁=Rhyzobium Kota, T₂=Rhyzobium Sriganganagar, T₃=Rhyzobium Jodhpur, T₄=Rhyzobium Durgapura, T₅=Rhyzobium I.A.R.I. and T₆=Rhyzobium Udaipur.

3. DESIGN:
   (i) Youden sq. (ii) (a) 7 blocks/sq.; 3 plots/block and 2 sqs. (b) N.A. (iii) 6. (iv) (a) and (b) 7.3 m. x 5.5 m. (v) Nil. (vi) Yes.
4. GENERAL:
   (i) Normal. (ii) Heavy infection of powdery mildew; spraying of sperules 0.5%.
   (iii) Yield of pea.
   (iv) 1963-contd. (b) No. (c) Nil. (v) Borkhera, Mandore and Durgapura. (vi) and (vii) Nil.

5. RESULTS:
   (i) 971 Kg/ha. (ii) 239.0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pea in Kg/ha.
   
<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
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<tr>
<td>Av. yield</td>
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<td>815</td>
<td>1100</td>
<td>1077</td>
<td>986</td>
<td>1072</td>
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</tbody>
</table>

**Crop:** Pea (Rabi).

**Ref:** Rj. 61(93) ; 62(59) ; 63(40).

**Site:** Govt. Agri. Res. Farm, Borkhera.

**Type:** ‘CM’.

Object: To study the effect of different levels of P and K with different spacings on the yield of Pea.

1. BASAL CONDITIONS:
   (i) (a) Groundnut-Maize-Pea for 61(93); N.A. for others. (b) Maize for 61(93) and 62(59); Fallow for 63(40). (c) Nil. (ii) Clay loam. (iii) 30.10.61; 20.10.62; 19.11.63. (iv) (a) Two ploughings and two bakherings. (b) Behind the plough. (c) 35 Kg/ha. for 61(93) and 62(59); 34 Kg/ha. for 63(40). (d) As per treatments. (e) N.A. (v) N.A. (vi) N.P. 29. (vii) Irrigated. (viii) N.A. for 61(93); 1 weeding for 62(59); 2 hoeings by kudali for 63(40). (ix) N.A. for 61(93) and 62(59); 7 cm. for 63(40). (x) N.A.

2. TREATMENTS:
   **Main-plot treatments:**
   4 spacings between rows: S₁=30, S₂=46, S₃=61 and S₄=91 cm.

   **Sub-plot treatments:**
   All combinations of (1) and (2)
   (1) 3 levels of P₂O₅: P₀=0, P₁=33.6 and P₂=67.2 Kg/ha.
   (2) 3 levels of K₂O: K₀=0, K₁=33.6 and K₂=67.2 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 5.2 m. x 4.3 m. for 61(93) and 62(59); 5.5 m. x 4.6 m. for 63(40). (b) 4.6 m. x 3.7 m. (c) 30 cm. x 30 cm. for 61(93) and 62(59); 46 cm. x 46 cm. for 63(40). (vi) Yes.

4. GENERAL:
   (i) N.A. for 61(93); Good for 62(59); Normal for 64(40). (ii) Effected by mildew, control measure for 61(93); N.A. for 62(59); Incidence of cut worm; controlled by spraying B.H.C. for 63(40). (iii) Yield of pea. (iv) a) 1961–1963. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS:
   61(93)
   (i) 12337 Kg/ha. (ii) (a) 1261.7 Kg/ha. (b) 1489.0 Kg/ha. (iii) Main effect of S, P, K and interaction P x S are highly significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
<th>Mean</th>
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<td>10440</td>
<td>10370</td>
<td>9927</td>
<td>7191</td>
<td>8820</td>
<td>9612</td>
<td>10043</td>
<td>9492</td>
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<tr>
<td>14661</td>
<td>17377</td>
<td>13191</td>
<td>9628</td>
<td>13253</td>
<td>14015</td>
<td>13874</td>
<td>13714</td>
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<td>14980</td>
<td>17013</td>
<td>13669</td>
<td>9558</td>
<td>12774</td>
<td>14463</td>
<td>14176</td>
<td>13804</td>
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<tr>
<td>Mean</td>
<td>13360</td>
<td>14920</td>
<td>12276</td>
<td>8792</td>
<td>11616</td>
<td>12697</td>
<td>12698</td>
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</table>

   | P₀  | 12807| 14227| 11307| 8123  |
   | K₁  | 13993| 14900| 12687| 9209  |
   | K₂  | 13280| 15633| 12832| 9044  |
Crop: - Pea (Rabi).

Site: - Govt. Agri. Farm, Durgapura.

Object: - To study the effect of fertility, moisture relationship with initial growth, germination and yield of pea.

I. BASAL CONDITIONS :
   (i) (a) Nil. (b) Moong. (c) N.A. (ii) Sandy loam. (iii) 1:1.5:5. (iv) (a) Disk ploughing and harrowing, mould board ploughing. (b) Behind the plough. (c) 37.6 Kg/ha. (d) 45 cm. x 15 cm. (e) N.A. (v) 33.6 Kg/ha. of K₂O. (vi) Bonelli. (vii) Irrigated. (viii) 4 weedings. (ix) N.A. (x) 3, 4.3.1966.

C.D. for S marginal means = 672.7 Kg/ha.
C.D. for P or K marginal means = 604.8 Kg/ha.
C.D. for P means at the same level of S = 1209.7 Kg/ha.
C.D. for S means at the same level of P = 1196.5 Kg/ha.

62(59)

(i) 5536 Kg/ha. (ii) (a) 1465.1 Kg/ha. (b) 1219.9 Kg/ha. (iii) Main effects of S, P and K are highly significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
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<td>493</td>
<td>3132</td>
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<td>P₂</td>
<td>664</td>
<td>703</td>
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<td>6146</td>
<td>7402</td>
<td>6209</td>
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<td>5418</td>
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<tr>
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<td>6153</td>
<td>6668</td>
<td>5711</td>
<td>3613</td>
<td>5112</td>
</tr>
</tbody>
</table>

C.D. for P or K marginal means = 495.5 Kg/ha.

63(40)

(i) 1330 Kg/ha. (ii) (a) 2215 Kg/ha. (b) 1686 Kg/ha. (iii) Main effect of S, P and K are highly significant and interaction S x P is significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
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<td>14281</td>
<td>15861</td>
<td>13128</td>
<td>9935</td>
<td>12584</td>
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</table>

C.D. for S marginal means = 781.1 Kg/ha.
C.D. for P or K marginal means = 495.5 Kg/ha.

Ref: - Rj. 65(22).
Type: - 'IM'.

Mean
2. TREATMENTS:

Main-plot treatments:
4 cultural treatments: $S_1$ = Dry sowing and post irrigation with normal seeds, $S_2$ = Pre irrigation and post sowing with normal seeds, $S_3$ = Dry sowing and post irrigation with 12 hrs. soaked seeds, and $S_4$ = Pre irrigation and post sowing with 12 hrs. soaked seeds.

Sub-plot treatments:
4 manural treatments: $F_1$ = 20 Kg/ha. of N+40 Kg/ha. of $P_2O_5$, $F_2$ = Twice $F_1$, $F_3$ = 40 Kg/ha. of $P_2O_5$ and $F_4$ = Twice $F_2$.

3. DESIGN:
(i) Split-plot. (ii) 4 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) 3.5 m. x 2.3 m. (b) 3.5 m. x 1.3 m. (v) 50 cm. x 50 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Germination count, stand, height and yield of pea etc. (iv) (a) 1965 - N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 3339 Kg/ha. (ii) (a) 723.2 Kg/ha. (b) 782.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>$F_1$</th>
<th>$F_2$</th>
<th>$F_3$</th>
<th>$F_4$</th>
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<td>4549</td>
<td>3463</td>
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<tr>
<td>$S_3$</td>
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<td>3046</td>
<td>3691</td>
<td>3251</td>
<td>3218</td>
</tr>
<tr>
<td>$S_4$</td>
<td>3051</td>
<td>3343</td>
<td>3629</td>
<td>3234</td>
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<td>Mean</td>
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<td>3379</td>
<td>3753</td>
<td>3167</td>
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**Crop:** Pea (*Rabi*).  
**Site:** Govt. Agri. Res. Farm, Sultanpur.  
**Ref:** Rj. 62(86).  
**Type:** ‘IM’.

Object: —To study the effect of different levels of irrigation under different levels of fertilisers on Pea.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) N.A. (iii) 4.11.62. (iv) (a) 2 bakherings with Bukhar and 2 ploughings with desl plough. (b) Behind the plough in rows. (c) 58 Kg/ha. (d) 30 cm. between lines (e) N.A. (v) Nil. (vi) Bonevilla. (vii) Irrigated. (viii) 1 hoeing. (ix) N.A. (x) 15.3.63.

2. TREATMENTS:

Main-plot treatments:
3 times of irrigation: $T_1$ = Every 15th day, $T_2$ = Every 22nd day and $T_3$ = Every 29th day.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 3 intensities of irrigation: $I_1$ = 1.5 acre inches, $I_2$ = 2.0 acre inches and $I_3$ = 2.5 acre inches.
(2) 3 fertility levels: $M_1$ = 33.6 Kg/ha. of $P_2O_5$ as Super. $M_2$ = 16.8 Kg/ha. of N as A/S + 33.6 Kg/ha. of $P_2O_5$ as Super + 15% $K_2O$ as Mur. Pot. and $M_3$ = Twice $M_2$.

3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/replication; 9 sub-plots/main-plot. (b) 12.2 m. x 10.4 m. (iii) 4. (iv) (a) 3.7 m. x 3.1 m. (b) 3.1 m. x 2.4 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Growth observations and yield of pea (iv) (a) 1962—contd. (b) No. (c) Nil. (v) to (vii) Nil.
5. RESULTS:
(i) 851 Kg/ha. (ii) (a) 183·9 Kg/ha. (b) 285·4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
<th>M₁</th>
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<td>T₃</td>
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<td>813</td>
<td>856</td>
<td>884</td>
<td>791</td>
<td>935</td>
<td>826</td>
<td>851</td>
</tr>
</tbody>
</table>

M₁: 737 739 779
M₂: 931 905 970
M₃: 751 824 903

Crop: Pea (Rabi).
Site: Govt. Agri. Res. Farm, Sultanpur.

Ref: Rj. 63(46).
Type: 'IM'.

Object: To find out the irrigation requirement under varying levels of fertilizers for Pea.

1. BASAL CONDITIONS:
(i) (a) to (c) Nil. (ii) N.A. (iii) 26.10.63. (iv) (a) 2 ploughings and 2 bakherings. (b) Behind the plough in rows. (c) 38 Kg/ha. (d) 30 cm. between lines. (e) N.A. (v) N.A. (vi) V. Bonevilla. (vii) Irrigated. (viii) 1 hoeing. (ix) N.A. (x) 9.3.64.

2. TREATMENTS:
Main-plot treatments: 
- 3 times of irrigation: T₁=Every 15th day, T₂=Every 22nd day and T₃=Every 29th day.
Sub-plot treatments: 
- 3 levels of fertilizers: M₁=33·6 Kg/ha. of P₂O₅ as Super, M₂=16·8 Kg/ha. of N as A/S+33·6 Kg/ha. of P₂O₅ as Super+16·8 Kg/ha. of K₂O as Mur. Pot. and M₃=Twice M₂.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 3·7 m. x 3·1 m. (b) 3·1 m. x 2·4 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of pea. (iv) (a) 1962—contd. (Modifed in 63). (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1432 Kg/ha. (ii) (a) 373·0 Kg/ha. (b) 301·0 Kg/ha. (iii) Main effect of M alone is highly significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>T₁</th>
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<th>T₃</th>
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<td>1720</td>
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<tr>
<td>Mean</td>
<td>1387</td>
<td>1364</td>
<td>1544</td>
<td>1432</td>
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C.D. for M marginal means=204·8 Kg/ha.
Crop :- Pea (Rabi).
Site :- Govt. Agri. Res. Farm, Sultanpur.

Object :- To find out the irrigation requirement under different fertility levels for Pea.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) N.A. (iii) 25.10.64. (iv) (a) 3 bakherings before sowing with Bakher. (b) Drilling. (c) N.A. (d) 46 cm. between lines. (e) Nil. (vi) Bonevilla. (vii) Irrigated. (viii) 1 weeding. (ix) Negligible. (x) 26.2.65.

2. TREATMENTS :
Main-plot treatments :
3 times of irrigation : T1 = Every 15th day, T2 = Every 22nd day and T3 = Every 29th day.

Sub-plot treatments :
3 levels of fertilizers : M1 = 33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super, M2 = 16.8 Kg/ha. of N as A/S + 33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super + 16.8 Kg/ha. of K<sub>2</sub>O as Pot. Sul. and M3 = 33.6 Kg/ha. of N as A/S + 67.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super + 6.8 Kg/ha. of K<sub>2</sub>O as Pot. Sul.

3. DESIGN and 4. GENERAL:
Same as in expt. no. 63(46) on page 261.

5. RESULTS :
(i) 2326 Kg/ha. (ii) (a) 605.6 Kg/ha. (b) 329.9 Kg/ha. (iii) Main effect of Malone is highly significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>M&lt;sub&gt;1&lt;/sub&gt;</th>
<th>M&lt;sub&gt;2&lt;/sub&gt;</th>
<th>M&lt;sub&gt;3&lt;/sub&gt;</th>
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<tr>
<td>Mean</td>
<td>1949</td>
<td>2387</td>
<td>2642</td>
<td>2326</td>
</tr>
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</table>

C.D. for M marginal means = 224.6 Kg/ha.

Crop :- Pea (Rabi).
Site :- Govt. Agri. Res. Farm, Borkhera.

Object :- To study the effect of different times of irrigation and levels of P on different varieties of Pea.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Jowar for 63(47); G.M. for 64(71); Fallow for 65(7). (c) Nil. (ii) Clay loam. (iii) 11.11.1963 ~ 24.10.1964; 28.10.1965. (iv) (a) Ploughing, bakhering and planking for 63(47) and 64(71); Harrowing by disc harrow for 65(7). (b) Behind the plough for 63(47); Drilling for 64(71) and 65(7). (c) 38 Kg/ha. for 63(47); 49 Kg/ha. for 64(71); 85 Kg/ha. for 65(7). (d) Between lines 30 cm. for 63(47) and 65(7); between lines 46 cm. for 64(71). (e) N.A. (vi) 56 Kg/ha. of N as A/S broadcast on 10.11.63 for 63(47); G.M. for 64(71); N.A. for 65(7). (vii) As per treatments. (viii) 1 hcing for 63(47); 1-2 hcedings for 64(71) and 65(7). (ix) 29 cm. for 63(47); Negligible for 64(71) and N.A. for 65(7). (x) 4.3.64 for 63(47); 4 and 5.3.65 for 64(71); 23.2.66 for 65(7).

2. TREATMENTS :
Main-plot treatments :
6 times of irrigations : I<sub>1</sub> = Irrigation after 30 days, I<sub>2</sub> = Irrigation after 60 days, I<sub>3</sub> = Irrigation after 90 days, I<sub>4</sub> = Irrigations after 30 and 60 days, I<sub>5</sub> = Irrigations after 30 and 90 days and I<sub>6</sub> = Irrigations after 60 and 90 days.
Sub-plot treatments:

All combinations of (1) and (2)

(1) 3 varieties: \( V_1 = \text{Chleabra}, V_2 = \text{Bonevilla} \) and \( V_3 = \text{N. P. 29} \).

(2) 3 levels of \( P_2 \) as Super: \( P_0 = 0 \), \( P_1 = 44.8 \) and \( P_2 = 89.7 \) Kg/ha.

3. DESIGN:

(i) Split-plot. (ii) (a) 6 main-plots/replication, 9 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 5.5 m × 4.3 m for 63(47); 4.3 m × 3.7 m for 64(71) and 65(7). (b) 4.9 m × 3.7 m for 63(47); 3.7 m × 3.1 m for 64(71) and 65(7). (v) 30 cm × 30 cm. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Effect of powdary mildew in latter stages for 63(47); incidence of borers for 64(71); N.A for 65(7). (iii) Yield of Pea. (iv) (a) 1963–1965. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Since the main-plot errors are heterogeneous and the main-plot Treatments × years interaction is absent, results of individual years are presented under 5. Results...

5. RESULTS:

63(47)

(i) 965 Kg/ha. (ii) (a) 136.0 Kg/ha. (b) 254.0 Kg/ha. (iii) Main effects of I, V and interaction I × V are highly significant and main effect of P is significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th></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>
<th>( V_1 )</th>
<th>( V_2 )</th>
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<td>644</td>
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<tr>
<td>( P_1 )</td>
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<td>575</td>
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<td>778</td>
</tr>
<tr>
<td>( P_2 )</td>
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<td>1051</td>
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<td>981</td>
<td>723</td>
<td>1054</td>
<td>902</td>
<td>557</td>
<td>835</td>
<td>765</td>
</tr>
</tbody>
</table>

C.D. for I marginal means = 116.5 Kg/ha.
C.D. for V or P marginal means = 120.5 Kg/ha.
C.D. for V means at the same level of I = 295.1 Kg/ha.
C.D. for I means at the same level of V = 266.0 Kg/ha.

64(71)

(i) 557 Kg/ha. (ii) (a) 683.3 Kg/ha. (b) 268.6 Kg/ha. (iii) Main effect of P is highly significant and that of V is significant. (iv) Av. yield of Pea in Kg/ha.

<table>
<thead>
<tr>
<th></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>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
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<td>318</td>
<td>392</td>
<td>628</td>
<td>446</td>
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<tr>
<td>( V_2 )</td>
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<td>374</td>
<td>224</td>
<td>698</td>
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<td>634</td>
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<td>( V_3 )</td>
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<td>646</td>
<td>740</td>
<td>740</td>
<td>389</td>
<td>691</td>
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<tr>
<td>Mean</td>
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<td>617</td>
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<td>807</td>
<td>393</td>
<td>558</td>
<td>718</td>
<td>557</td>
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</tbody>
</table>

C.D. for P or V marginal means = 127.4 Kg/ha.
(i) 993 Kg/ha. (ii) (a) 496.4 Kg/ha. (b) 290.5 Kg/ha. (iii) Main effect of I is significant and that of V is highly significant. (iv) Av. yield of Pea in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>l₁</th>
<th>l₂</th>
<th>l₃</th>
<th>l₄</th>
<th>l₅</th>
<th>l₆</th>
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<th>P₂</th>
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<td>977</td>
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<td>993</td>
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<td>V₃</td>
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<td>1061</td>
<td>1107</td>
<td>832</td>
<td>954</td>
<td>1193</td>
<td>993</td>
</tr>
</tbody>
</table>

C.D. for I marginal means = 425.4 Kg/ha.
C.D. for V marginal means = 137.8 Kg/ha.

**Crop:** Pea (Rabi).

**Site:** Govt. Agri. Farm, Banswara.

**Object:** To study the efficiency of different fungicides in the control of powdery mildew of Pea.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) and (c) N.A. (ii) Red loam. (iii) N.A. (iv) (a) 2 ploughings, 1 bakherings and 1 plaking.
   (b) N.A. (c) 39 Kg/ha. (d) 30 cm. between plants. (e) N.A. (v) 10 Kg. of Urea for whole of the experiment. (vi) N.P. 29. (vii) Irrigated. (viii) 1 hand weeding. (ix) N.A. (x) 25.2.64; 6, 16.3.64.

2. **TREATMENTS:**
   9 fungicidal treatments: T₁=Control, T₂=Sersul 0.5%, T₃=Eiosal 0.5%, T₄=Speraz 0.3%, T₅=Karathane 0.2%, T₆=B.P. wettable sulphur 0.25%, T₇=Ultra Sulphur 0.25%, T₈=Sulphur dust at 11.2 Kg/ha. + ash at 5.6 Kg/ha. and T₉=Sulphur dust at 16.8 Kg/ha.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 5’5 m. x 3’7 m. (b) 4’6 m. x 2’7 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. **GENERAL:**
   (i) N.A. (ii) Attack of powdery mildew. control measures as per treatments. (iii) Percentage disease index and weight of green pods. (iv) (a) 1963—N.A. (b) No. (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. **RESULTS:**
   (i) 47.3 degrees. (ii) 5.17 degree. (iii) Treatment differences are highly significant. (iv) Av. of disease index in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
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<td>Mean angle</td>
<td>56.8</td>
<td>46.5</td>
<td>48.0</td>
<td>48.0</td>
<td>49.4</td>
<td>46.5</td>
<td>48.0</td>
<td>39.2</td>
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<tr>
<td>C.D.</td>
<td>7.53 degrees.</td>
<td></td>
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</tbody>
</table>
Crop: Pea (Rabi).
Site: Govt. Agri. Farm, Mandore.

Object: To study the effect of different fungicides in the control of Powdery Mildew of Pea.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 12.11.63. (iv) (a) 2 ploughings. (b) Behind the plough. (c) 37 Kg/ha. (d) 46 cm. between lines. (e) N.A. (v) 0.07 cu. meters/ha. of T.C. and 44.8 Kg/ha. of A/S. (vi) Bonevilla. (vii) Irrigated. (viii) 1 weeding. (x) N.A. (x) 10.3.64.

2. TREATMENTS:
   9 fungicidal treatments: T₀ = Control, T₁ = Sper sul 0.5%, T₂ = Elcosal 0.5%, T₃ = Thiovit 0.5%, T₄ = Ultra Sulphur 0.25%, T₅ = Karathane W.D. 0.2%, T₆ = Wettable sulpha 0.5% and T₇ = Sulphur dust at 16.8 Kg/ha.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 5.5 m. x 3.7 m. (b) 4.6 m. x 2.7 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Effect of powdery mildew; Control measures are taken as per treatments. (iii) No. of plants affected by powdery mildew/plot and yield of pea. (iv) (a) 1962-N.A. (b) No. (c) N.A. (v) (a) Durgapura, Sriganganagar and Kota. (vi) N.A. (vii) Nil.
5. RESULTS:
(i) 290 Kg/ha. (ii) 167 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_0</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
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</tr>
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<tbody>
<tr>
<td>Av. yield</td>
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<td>287</td>
<td>234</td>
<td>263</td>
<td>339</td>
<td>257</td>
<td>341</td>
<td>438</td>
<td>257</td>
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</tbody>
</table>

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

**Site :- Govt. Agri. Farm, Sriganganar.**

Object: —To study the efficacy of different fungicides in the control of *powdery* mildew of Pea.

1. BASAL CONDITIONS:
(i) (a) No. (b) Cotton. (c) 44.8 Kg/ha. of N. (ii) Sandy loam. (iii) 14.11.62. (iv) (a) 3 ploughings (b) and (c) N.A. (d) 61 cm. between rows. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 3 hoeings and weeding. (ix) N.A. (x) 12.4.63.

2. TREATMENTS:
8 fungicidal treatments: T_0 = Control, T_1 = 5 persul 0.5%, T_2 = Elatol 0.5%, T_3 = Talovic 0.5%, T_4 = Nitra sulphur 0.25%, T_5 = Karathane W.D. 0.2%, T_6 = Wettable sulphur 0.3% and T_7 = Sulphur dust at 16.8 Kg/ha.

3. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 5.5 m. x 3.7 m. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of Pea. (iv) (a) 1952-Treatment; (v) (a) Banswara and Mandore. (b) N.A. (vi) and (vii) N.A.

5. RESULTS:
(i) 673 Kg/ha. (ii) 140.9 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_0</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
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<td>Av. yield</td>
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<td>897</td>
<td>648</td>
<td>648</td>
<td>598</td>
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</table>
4. GENERAL:

(i) Normal. (ii) Attack of powdery mildew; Control measures as per treatments. (iii) Yield of pea and fodder. (iv) (a) 1962-contd. (b) No. (c) N.A. (v) (a) Mandore, Durgapura and Banswara. (vi) N.A. (vii) Nil.

5. RESULTS:

(i) 2155 Kg/ha. (ii) 478 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1495</td>
<td>2392</td>
<td>2372</td>
<td>2392</td>
<td>1934</td>
<td>2452</td>
<td>2292</td>
<td>1933</td>
</tr>
</tbody>
</table>

Crop :- Pea (Rabi).
Site :- Govt. Agri. Res. Farm, Sriganganagar.

Object :- To find out the optimum dose and time of sperul application for the control of powdery mildew of Pea.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Pea. (c) N.A. (ii) Sandy loam. (iii) 17.11.65. (iv) (a) Ploughing and planking with tractor and plank. (b) Local method of sowing. (c) N.A. (d) 46 cm. between lines. (e) N.A. (v) 33.6 Kg/ha. of N+33.6 Kg/ha. of P2O5. (vi) Voveilla. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 14.4.66.

2. TREATMENTS:

8 spraying treatments : T0 = Control (no spray), T1 = Spray of sperul 2% at 10 days interval, T2 = Spray of sperul 3% at 10 days interval, T3 = Spray of sperul 4% at 10 days interval, T4 = Spray of sperul 2% at 15 days interval, T5 = Spray of sperul 3% at 15 days interval, T6 = Spray of sperul 4% at 15 days interval

3. DESIGN:

(i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 3.7 m. x 2.7 m. (b) 2.7 m. x 1.8 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of pea etc. (iv) (a) 1965. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1861 Kg/ha. (ii) 642 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pea in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1440</td>
<td>1873</td>
<td>1814</td>
<td>2239</td>
<td>1848</td>
<td>1922</td>
<td>1973</td>
<td>1778</td>
</tr>
</tbody>
</table>

Crop :- Sugarcane.
Site :- Govt. Agri. Res. Farm, Sriganganagar.

Object :- To study the effect of different types of fertilizers at different levels and their combination on the yield and quality of Sugarcane.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Nil. Wheat. (c) Nil. N.A. (ii) Sandy loam. (iii) 13.3.1961; 29.3.1963. (iv) (a) 5 ploughings. (b) N.A. (c) N.A.; 55.3 Q/ha. (d) 91 cm. between rows; 91 cm. x 30 cm. in 1963. (e) N.A. (v) N.A. (vi) Co—312. (vii) Irrigated. (viii) 4 to 5 weedings. (ix) N.A. (x) 23.12.1961; 9, 10.1.1964.

2. TREATMENTS:

All combinations of (1), (2), (3) and (4)+3 extra treatments (in each block)

(1) 3 levels of N as A/S : N1=67.2, N2=134.5 and N3=201.7 Kg/ha.
(2) 3 levels of P2O5 as Super : P1=0, P2=56.0 and P3=112.1 Kg/ha.
(3) 3 levels of K₂O as Mur. Pot.: K₃₀, K₃₀=550 and K₃₀=1121 Kg/ha.
(4) 3 levels of F.Y.M.: F₀=0, F₁=11208 and F₂=22417 Kg/ha.
Extra treatments are: E₁=269 Kg/ha. of N as A/S+1121 Kg/ha. of P₂O₅ as Super+1121 Kg/ha. of K₂O as Mur. Pot., E₂=1345 Kg/ha. of N as A/S+1315 Kg/ha. of N as oil cake+1500 Kg/ha. of P₂O₅ as Super+1500 Kg/ha. of K₂O as Mur. Pot.

3. DESIGN:
(i) 3² x 3 fact. confd. (ii) (a) 12 plots/block; 9 blocks/replication. (b) N.A. (iii) 1. (iv) (a) 9:2 m. x 5:5 m, (b) 7:4 m. x 3:7 m. (v) 61 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) Poor growth of the plants in 1961; Poor. (ii) Heavy effect of the top borer in 1961. Crop affected badly by top borer in 1963. Dusting of B.H.C 5% to control it. (iii) Yield of Sugarcane. (iv) (a) 1961—contd, (b) No. (c) N.A. (v) and (vi) N.A. (vii) Error variances are homogeneous. Treatments x years interaction is absent.

5. RESULTS:
(i) 384.0 Q/ha. (ii) 109.0 Q/ha. [based on 162 d.f, made up of pooled error and various components of Treatments x years interaction]. (iii) Main effect of N is highly significant. ‘Extra treatments vs. Others’ is also highly significant. (iv) Av. yield of cane in Q/ha.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>283.2</td>
<td>311.4</td>
<td>365.5</td>
<td>343.0</td>
<td>326.6</td>
<td>290.6</td>
<td>315.3</td>
<td>341.8</td>
<td>303.0</td>
<td>320.0</td>
</tr>
<tr>
<td>N₁</td>
<td>364.1</td>
<td>350.0</td>
<td>353.3</td>
<td>340.7</td>
<td>390.6</td>
<td>336.0</td>
<td>376.8</td>
<td>322.4</td>
<td>368.2</td>
<td>355.8</td>
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<tr>
<td>N₂</td>
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<td>438.8</td>
<td>421.6</td>
<td>415.9</td>
<td>419.8</td>
<td>418.0</td>
<td>381.2</td>
<td>446.4</td>
<td>426.1</td>
<td>417.9</td>
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<tr>
<td>Mean</td>
<td>346.9</td>
<td>366.7</td>
<td>380.1</td>
<td>366.5</td>
<td>379.0</td>
<td>348.2</td>
<td>357.8</td>
<td>370.2</td>
<td>365.8</td>
<td>364.6</td>
</tr>
<tr>
<td>F₄</td>
<td>348.7</td>
<td>364.4</td>
<td>360.2</td>
<td>343.6</td>
<td>364.7</td>
<td>365.0</td>
<td>343.6</td>
<td>364.7</td>
<td>365.0</td>
<td></td>
</tr>
<tr>
<td>F₁</td>
<td>367.9</td>
<td>364.1</td>
<td>378.6</td>
<td>371.6</td>
<td>389.6</td>
<td>349.4</td>
<td>371.6</td>
<td>389.6</td>
<td>349.4</td>
<td></td>
</tr>
<tr>
<td>F₄</td>
<td>324.1</td>
<td>371.6</td>
<td>401.6</td>
<td>384.4</td>
<td>382.8</td>
<td>330.2</td>
<td>384.4</td>
<td>382.8</td>
<td>330.2</td>
<td></td>
</tr>
<tr>
<td>K₀</td>
<td>354.0</td>
<td>374.0</td>
<td>371.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K₁</td>
<td>354.5</td>
<td>384.5</td>
<td>398.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>K₂</td>
<td>332.1</td>
<td>341.6</td>
<td>370.9</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

C.D. for N marginal means=41.6 Q/ha.
C.D. for extra treatments vs. others=33.9 Q/ha

Crop :- Sugarcane.
Ref :- Rj. 63, 64, 65(S.F.T). for Sriganganagar, Kota and 65(S.F.T.) for Banswara.
Site :- (District) : Sriganganagar, Kota and Banswara. Type :- ‘M’.
Object :- To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients (Type : A₁).

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Desert soil; Red and black; Red and yellow. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.
2. TREATMENTS:

8 manural treatments

O = Control (no manure).

N = $16.8 \text{ Kg/ha. of N.}$

$N_1 = 33.6 \text{ Kg/ha. of N.}$

$P_1 = 33.6 \text{ Kg/ha. of P}_2O_5$

$N_1P_1 = 16.8 \text{ Kg/ha. of } N + 33.6 \text{ Kg/ha. of } P_2O_5$

$N_2P_1 = 33.6 \text{ Kg/ha. of } N + 33.6 \text{ Kg/ha. of } P_2O_5$

$N_3P_1 = 33.6 \text{ Kg/ha. of } N + 67.2 \text{ Kg/ha. of } P_2O_5$

$N_4P_1K_1 = 33.6 \text{ Kg/ha. of } N + 67.2 \text{ Kg/ha. of } P_2O_5 + 33.6 \text{ Kg/ha. of } K_2O$

N applied as A/S; $P_2O_5$ as Super and $K_2O$ as Mur. of Pot.

3. DESIGN:

A selected district is divided into four agriculturally homogenous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50—100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A, 11 of type B, 11 of type C. The eleven experiments under type A, A and A are distributed as 3 on a kharif cereal, 3 on a rabi cereal, 3 on a cash crop and 2 on oilseed. All the three type—C experiments are conducted on a legume crop. For the purpose of conducting the A, A and A experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type A, A and A are laid out. For conducting the three type—C trials three villages are randomly selected in each block.

4. GENERAL:

(1) to (iii) N.A. (iv) (a) 1963 to 1965 for Sri ganaganagar, 1964 to 1965 for Kota and 1965 to 1966 for Banswara. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

Sriganganagar

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$P_1$</th>
<th>$N_1P_1$</th>
<th>$N_2P_1$</th>
<th>$N_3P_1$</th>
<th>$N_2P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cane yield in Q/ha.</td>
<td>162.7</td>
<td>253.1</td>
<td>44.1</td>
<td>178.2</td>
<td>340.8</td>
<td>349.1</td>
<td>365.9</td>
<td>32.7</td>
</tr>
</tbody>
</table>

Control yield=465'7 Q/ha.; No. of trials=8.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$P_1$</th>
<th>$N_1P_1$</th>
<th>$N_2P_1$</th>
<th>$N_3P_1$</th>
<th>$N_2P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cane yield in Q/ha.</td>
<td>631</td>
<td>185.4</td>
<td>43.8</td>
<td>146.5</td>
<td>242.1</td>
<td>269.7</td>
<td>279.3</td>
<td>23.7</td>
</tr>
</tbody>
</table>

Control yield=475'8 Q/ha.; No. of trials=9.

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$P_1$</th>
<th>$N_1P_1$</th>
<th>$N_2P_1$</th>
<th>$N_3P_1$</th>
<th>$N_2P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cane yield in Q/ha.</td>
<td>566</td>
<td>93.3</td>
<td>138.7</td>
<td>93.5</td>
<td>262.8</td>
<td>171.9</td>
<td>175.3</td>
<td>93.5</td>
</tr>
</tbody>
</table>

Control yield=326'7 Q/ha.; No. of trials=11.

Kota

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$P_1$</th>
<th>$N_1P_1$</th>
<th>$N_2P_1$</th>
<th>$N_3P_1$</th>
<th>$N_2P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cane yield in Q/ha.</td>
<td>471</td>
<td>94.1</td>
<td>27.2</td>
<td>123.0</td>
<td>178.4</td>
<td>214.7</td>
<td>252.6</td>
<td>51.2</td>
</tr>
</tbody>
</table>

Control yield=558'2 Q/ha.; No. of trials=4.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$P_1$</th>
<th>$N_1P_1$</th>
<th>$N_2P_1$</th>
<th>$N_3P_1$</th>
<th>$N_2P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cane yield in Q/ha.</td>
<td>628</td>
<td>.88</td>
<td>36.8</td>
<td>139.4</td>
<td>199.4</td>
<td>272.5</td>
<td>269.9</td>
<td>91.5</td>
</tr>
</tbody>
</table>

Control yield=523'2 Q/ha.; No. of trials=6.
65 (S.F.T.)

Treatment

Av. response of cane yield in Q/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₃</th>
<th>N₁P₃K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>101.6</td>
<td>156.4</td>
<td>29.2</td>
<td>114.1</td>
<td>168.3</td>
<td>228.7</td>
<td>234.5</td>
<td>12.3</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 532.5 Q/ha.; No. of trials = 9.

Banswara

65 (S.F.T.)

Treatment

Av. response of cane yield in Q/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₃</th>
<th>N₁P₃K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>86.7</td>
<td>138.7</td>
<td>27.3</td>
<td>205.3</td>
<td>276.7</td>
<td>288.0</td>
<td>310.7</td>
<td>25.3</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 452.7 Q/ha.; No. of trials = 3.

Crop: Sugarcane.

Site: (District) Banswara, Sriganganagar and Kota.

Ref: Rj. 63, 64, 65 (S.F.T.)

Type: ‘M’.

Object: To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients (Type: A₁).

1. BASAL CONDITIONS:
   (i) N.A. (ii) Red and yellow; Desert soil; Red and black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   8 manurial treatments:
   O = Control (no manure).
   N₁ = 16.8 Kg/ha. of N.
   P₁ = 33.6 Kg/ha. of P₂O₅.
   N₁P₁ = 16.8 Kg/ha. of N + 33.6 Kg/ha. of P₂O₅.
   N₂P₁ = 33.6 Kg/ha. of N + 67.2 Kg/ha. of P₂O₅.
   N₂P₂ = 33.6 Kg/ha. of N + 67.2 Kg/ha. of K₂O.
   N₁P₁K₁ = 33.6 Kg/ha. of N + 67.2 Kg/ha. of P₂O₅ + 67.2 Kg/ha. of K₂O.

N applied as A/S, P₂O₅ as Super and K₂O as Murr. of Pot.

3. DESIGN:
   Same as in Type A₁ (irrigated) on page no. 268.

4. GENERAL:
   (i) to (iii) N.A. (iv) (a) 1953 to 1955 for Sriganganagar and 1953 to 1965 for others. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

Banswara

63 (S.F.T.)

Treatment

Av. response of cane yield in Q/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>P₁</th>
<th>P₂</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₃</th>
<th>N₁P₃K₂</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>110.7</td>
<td>158</td>
<td>207.6</td>
<td>251.0</td>
<td>361.8</td>
<td>375.6</td>
<td>359.8</td>
<td>38.6</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 523.9 Q/ha.; No. of trials = 2.

64 (S.F.T.)

Treatment

Av. response of cane yield in Q/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>P₁</th>
<th>P₂</th>
<th>N₁P₁</th>
<th>N₁P₂</th>
<th>N₁P₃</th>
<th>N₁P₃K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>102.8</td>
<td>31.0</td>
<td>76.4</td>
<td>116.6</td>
<td>183.2</td>
<td>307.7</td>
<td>379.5</td>
<td>22.6</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 510.0 Q/ha.; No. of trials = 3.
### Treatment of Sugarcane

**Srigangnagar**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;P&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&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;2&lt;/sub&gt;K&lt;sub&gt;2&lt;/sub&gt;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cane yield in Q/ha.</td>
<td>108.7</td>
<td>44.7</td>
<td>78.0</td>
<td>168.7</td>
<td>215.3</td>
<td>290.7</td>
<td>318.7</td>
</tr>
</tbody>
</table>

Control yield = 533.3 Q/ha.; No. of trials = 3.

**Kota**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;</th>
<th>P&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;2&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cane yield in Q/ha.</td>
<td>117.2</td>
<td>22.5</td>
<td>59.2</td>
<td>146.9</td>
<td>156.2</td>
<td>284.5</td>
<td>287.3</td>
</tr>
</tbody>
</table>

Control yield = 424.0 Q/ha.; No. of trials = 10.

**64 (S.F.T.)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;</th>
<th>P&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;2&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;P&lt;sub&gt;1&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cane yield in Q/ha.</td>
<td>66.7</td>
<td>22.3</td>
<td>39.0</td>
<td>87.8</td>
<td>82.9</td>
<td>150.8</td>
<td>143.7</td>
</tr>
</tbody>
</table>

Control yield = 348.0 Q/ha.; No. of trials = 11.

**Crop:** Sugarcane.  
**Ref:** Rj. 63, 64, 65 (S.F.T).  
**Site:** (District) Banswara, Sriganganagar and Kota.  
**Type:** ‘M’.

Object: To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients (Type : A).
1. BASAL CONDITIONS:
   (i) N.A. (ii) Red and yellow ; Desert soil; Red and black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   O = Control (no manure).
   \( N_1 = 16.8 \text{ Kg/ha. of N} \)
   \( K_1 = 33.6 \text{ Kg/ha. of K}_2\text{O} \)
   \( K_2 = 67.2 \text{ Kg/ha. of K}_2\text{O} \)
   \( N_1K_1 = 16.8 \text{ Kg/ha. of N} + 33.6 \text{ Kg/ha. of K}_2\text{O} \)
   \( N_1K_2 = 16.8 \text{ Kg/ha. of N} + 67.2 \text{ Kg/ha. of K}_2\text{O} \)
   \( N_1K_4 = 33.6 \text{ Kg/ha. of N} + 67.2 \text{ Kg/ha. of K}_2\text{O} \)
   \( N_1P_1K_1 = 16.8 \text{ Kg/ha. of N} + 33.6 \text{ Kg/ha. of P}_2\text{O}_5 + 33.6 \text{ Kg/ha. of K}_2\text{O} \)
   N applied as A/S, P\_2O_5 as Super and K\_2O as Mur. Pot.

3. DESIGN:
   Same as in type A\(_1\) (Irrigated), on page no. 268.

4. GENERAL:
   (i) to (iii) N.A. (iv) (a) 1963 to 1965 for Banswara and Kota and 1963 to 1966 for Sriganganagar (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:
   Banswara
   63(S.F.T.)
   Treatment
   \[ \begin{array}{cccccccc}
   N_1 & K_1 & K_2 & N_1K_1 & N_1K_2 & N_1K_4 & N_1P_1K_1 & S.E. \\
   \hline
   102.8 & 39.5 & 70.2 & 108.7 & 205.6 & 249.1 & 251.1 & 38.1 \\
   \end{array} \]
   Control yield = 529.8 Q/ha.; No. of trials = 2.

   64(S.F.T.)
   Treatment
   \[ \begin{array}{cccccccc}
   N_1 & K_1 & K_2 & N_1K_1 & N_1K_2 & N_1K_4 & N_1P_1K_1 & S.E. \\
   \hline
   95.2 & 17.1 & 47.4 & 156.2 & 179.9 & 224.7 & 255.7 & 16.3 \\
   \end{array} \]
   Control yield = 470.0 Q/ha.; No. of trials = 3.

   65(S.F.T.)
   Treatment
   \[ \begin{array}{cccccccc}
   N_1 & K_1 & K_2 & N_1K_1 & N_1K_2 & N_1K_4 & N_1P_1K_1 & S.E. \\
   \hline
   80.0 & 18.0 & 28.7 & 136.0 & 181.3 & 210.0 & 235.3 & 21.4 \\
   \end{array} \]
   Control yield = 495.0 Q/ha.; No. of trials = 3.

   Sriganganagar
   63(S.F.T.)
   Treatment
   \[ \begin{array}{cccccccc}
   N_1 & K_1 & K_2 & N_1K_1 & N_1K_2 & N_1K_4 & N_1P_1K_1 & S.E. \\
   \hline
   173.3 & 27.5 & 61.6 & 181.3 & 182.4 & 280.8 & 237.2 & 31.6 \\
   \end{array} \]
   Control yield = 516.2 Q/ha.; No. of trials = 8.

   64(S.F.T.)
   Treatment
   \[ \begin{array}{cccccccc}
   N_1 & K_1 & K_2 & N_1K_1 & N_1K_2 & N_1K_4 & N_1P_1K_1 & S.E. \\
   \hline
   72.2 & 27.4 & 45.0 & 125.2 & 134.7 & 196.4 & 154.8 & 31.9 \\
   \end{array} \]
   Control yield = 319.1 Q/ha.; No. of trials = 7.
Crop : Sugarcane.

Site : As per treatments.

Object (Type : A) : To study the response of Sugarcane to different levels of N, P and K applied individually and in combination.

1. BASAL CONDITIONS:
   (i) to (c) N.A.  (ii) As per treatments.  (iii) to (vi) N.A.  (vii) As per treatments.  (viii) to (x) N.A.

2. TREATMENTS:
   O = Control (no manure)
   N = 67.3 Kg/ha. of N as A/S
   P = 44.8 Kg/ha. of P\textsubscript{2}O\textsubscript{5} as Super.
   K = 44.8 Kg/ha. of K\textsubscript{2}O as Mur. Pot.
   NP = 67.3 Kg/ha. of N as A/S + 44.8 Kg/ha. of P\textsubscript{2}O\textsubscript{5} as Super.
   NK = 67.3 Kg/ha. of N as A/S + 44.8 Kg/ha. of K\textsubscript{2}O as Mur. Pot.
   PK = 44.8 Kg/ha. of P\textsubscript{2}O\textsubscript{5} as Super + 44.8 Kg/ha. of K\textsubscript{2}O of as Mur. Pot.
   NPK = 67.3 Kg/ha. of N as A/S + 44.8 Kg/ha. of P\textsubscript{2}O\textsubscript{5} as Super + 44.8 Kg/ha. of K\textsubscript{2}O as Mur. Pot.

3. DESIGN:
   (i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on kharif cereal, 8 on rabi cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on Type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/98 8 ha.  (b) 1/197-7 ha.  (iv) Yes.

4. GENERAL:
   (i) to (vii) N.A.
5. RESULTS:

<table>
<thead>
<tr>
<th>District</th>
<th>No. of trials</th>
<th>Control yield</th>
<th>N P K</th>
<th>S.E.</th>
<th>NP NK PK NPK</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banswara</td>
<td>5</td>
<td>414.6</td>
<td>90.8</td>
<td>23.2</td>
<td>0.6</td>
<td>31.5</td>
</tr>
<tr>
<td>Kota</td>
<td>9</td>
<td>323.2</td>
<td>78.4</td>
<td>69.0</td>
<td>27.4</td>
<td>10.5</td>
</tr>
<tr>
<td>Sriganganagar</td>
<td>9</td>
<td>519.1</td>
<td>85.9</td>
<td>65.3</td>
<td>17.2</td>
<td>20.7</td>
</tr>
</tbody>
</table>

Crop: - Sugarcane.
Site: - (District): Banswara, Sriganganagar and Kota.
Ref: - Rj. 60(SFT).

Object (Type: B): - To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) Red and black; Desert; Medium black.  (iii) to (x) N.A.

2. TREATMENTS:
   O = Control (No manure).
   \( n_1 = 67.3 \text{ Kg/ha. of N as A/S.} \)
   \( n_2 = 134.6 \text{ Kg/ha. of N as A/S.} \)
   \( n'_1 = 67.3 \text{ Kg/ha. of N as Urea.} \)
   \( n'_2 = 134.6 \text{ Kg/ha. of N as Urea.} \)
   \( n''_1 = 67.3 \text{ Kg/ha. of N as A/S/N.} \)
   \( n''_2 = 134.6 \text{ Kg/ha. of N as A/S/N.} \)
   \( n'''_1 = 67.3 \text{ Kg/ha. of N as C/A/N.} \)
   \( n'''_2 = 134.6 \text{ Kg/ha. of N as C/A/N.} \)

3. DESIGN:
   Same as in type A1 (Irrigated) on page no. 268.

4. GENERAL:
   (i) to (vii) N.A.

5. RESULTS:

<table>
<thead>
<tr>
<th>District</th>
<th>No. of trials</th>
<th>O</th>
<th>( n_1 )</th>
<th>( n_2 )</th>
<th>( n'_1 )</th>
<th>( n'_2 )</th>
<th>( n''_1 )</th>
<th>( n''_2 )</th>
<th>G.M</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banswara</td>
<td>2</td>
<td>400'3</td>
<td>407'7</td>
<td>467'6</td>
<td>322'8</td>
<td>409'5</td>
<td>—</td>
<td>487'9</td>
<td>448'3</td>
<td>420'6</td>
</tr>
<tr>
<td>Sriganganagar</td>
<td>8</td>
<td>479'1</td>
<td>616'7</td>
<td>671'0</td>
<td>542'3</td>
<td>684'0</td>
<td>—</td>
<td>599'6</td>
<td>714'6</td>
<td>615'3</td>
</tr>
<tr>
<td>Kota</td>
<td>9</td>
<td>300'2</td>
<td>371'6</td>
<td>419'1</td>
<td>349'9</td>
<td>417'9</td>
<td>357'8</td>
<td>430'5</td>
<td>—</td>
<td>378'1</td>
</tr>
</tbody>
</table>

Crop: - Sugarcane (Kharif).
Site: - Govt. Agri. Res. Farm, Borkhera.
Ref: - Rj. 64(35).

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

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) Paddy.  (c) N.A.  (ii) Black cotton soil.  (iii) 28, 29, 2.64.  (iv) (a) N.A.  (b) Flat planting.  (c) 43243 three budded sets/ha.  (d) Between lines 76 cm.  (e) N.A.  (v) 67 Kg/ha. of P\(_2\)O\(_5\) was applied at the time of planting in furrows.  (vi) As per treatments.  (vii) Irrigated.  (viii) 2 hoeings and 3 weedings.  (ix) N.A.  (x) 13 to 18.4.65.
2. **TREATMENTS**:

   All combinations of (1) and (2)
   
   (1) 3 varieties of Sugarcane: $V_1 = C_0 - 527$, $V_2 = C_0 - 1007$ and $V_3 = C_0 - 1111$.
   
   (2) 2 levels of N: $N_1 = 112$ and $N_2 = 224$ Kg/ha.

   Each treatment is applied in 2 plots.

3. **DESIGN**:

   (i) Fact. in R.B.D.  (ii) (a) 12.  (b) N.A.  (iii) 3.  (iv) (a) 9'8 m. x 6'1 m.  (b) 8'2 m. x 4'6 m.  (v) 76 cm. x 76 cm.  (vi) Yes.

4. **GENERAL**:

   (i) Satisfactory.  (ii) Incidence of pyrilla controlled by spraying of 0.02% Endrix.  (iii) Germination on %, tiller counts, height, stand, juice quality and yield of Sugarcane.  (iv) (a) 1964—N.A.  (b) No.  (c) N.A.  (v) and (vi) N.A.  (vii) Nil.

5. **RESULTS**:

   I. **Yield**.

   (i) 589'1 Q/ha.  (ii) 108'2 Q/ha.  (iii) Main effect of N alone is highly significant.  (iv) Av. yield of sugarcane in Q/ha.

<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>$N_1$</td>
<td>500'6</td>
<td>414'1</td>
<td>493'3</td>
<td>469'3</td>
</tr>
<tr>
<td>$N_2$</td>
<td>616'5</td>
<td>711'0</td>
<td>799'2</td>
<td>708'9</td>
</tr>
<tr>
<td>Mean</td>
<td>558'6</td>
<td>562'6</td>
<td>646'2</td>
<td>589'1</td>
</tr>
</tbody>
</table>

   C.D. for N marginal means=74'6 Q/ha.

   II. **Germination**.

   (i) 42.34 degrees.  (ii) 6'38 degrees.  (iii) Main effect of V alone is significant.  (iv) Av. germination % in degrees.

<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>$N_1$</td>
<td>40'12</td>
<td>40'87</td>
<td>47'10</td>
<td>42'70</td>
</tr>
<tr>
<td>$N_2$</td>
<td>39'37</td>
<td>39'37</td>
<td>47'22</td>
<td>41'99</td>
</tr>
<tr>
<td>Mean</td>
<td>39'74</td>
<td>40'12</td>
<td>47'16</td>
<td>42'34</td>
</tr>
</tbody>
</table>

   C.D. for V marginal means=5'4 degrees.

---

**Crop**: Sugarcane (*Kharif*).

**Site**: Govt. Agri. Res. Farm, Borkhera.

**Ref**: Rj. 63(98).

**Type**: ‘CV’.

Object:—To study the effect of times of planting on different varieties of Sugarcane.

I. **BASAL CONDITIONS**:

   (i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) Heavy black cotton soil.  (iii) As per treatments.  (iv) (a) N.A.  (b) Furrow method of planting.  (c) 43243 three budded sets/ha.  (d) Between lines 76 cm, (e) 1 set.  (v) 134 Kg/ha. of N half at the time of planting and half at top dressing.  (vi) As per treatments.  (vii) Irrigated.  (viii) 4 hand weedings.  (ix) N.A.  (x) 4, 5.3.64.
2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 lines of planting: \( T_1 = \text{Autumn (23, 24,10.62)} \) and \( T_2 = \text{Spring (9.2.63)} \).
   (2) 2 varieties: \( V_1 = C_4 \) \(-419\) and \( V_2 = C_4 \) \(-527\).

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 10.1 m. \( \times \) 6.9 m. (b) 8.5 m. \( \times \) 5.3 m. (v) 76 cm. \( \times \) 76 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Infection of aphids observed and spraying done with Endrine on 21.5.63. (iii) Yield of sugarcane. (iv) 1963 only. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 763.4 Q/ha. (ii) 195.2 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of sugarcane in Q/ha,

\[
\begin{array}{ccc}
V_1 & V_2 & \text{Mean} \\
T_1 & 909.7 & 770.0 & 839.8 \\
T_2 & 661.1 & 712.9 & 687.0 \\
\text{Mean} & 785.4 & 741.4 & 763.4 \\
\end{array}
\]

Crop :- Sugarcane (Kharif).
Site :- Govt. Agri. Res. Farm, Borkhera.
Ref :- Rj. 63(100).
Type :- ‘CM’.

Object :- To study the effect of spacings and different levels of N on the yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Gram. (c) Nil. (ii) Black cotton heavy soil. (iii) 19, 20.3.63. (iv) (a) N.A. (b) Furrow method of planting. (c) 43243 three budded sets/ha. (d) As per treatments. (e) 1 set. (v) Nil. (vi) \( C_4 \) \(-419\). (vii) Irrigated. (viii) 4 hand weedings. (ix) N.A. (x) 20 to 22.2.64.

2. TREATMENTS:
   Main-plot treatments:
   4 spacings between rows: \( S_1 = 61, S_2 = 76, S_3 = 91 \) and \( S_4 = 107 \) cm.
   Sub-plot treatments:
   5 levels of N: \( N_1 = 0, N_2 = 56.0, N_3 = 112.1, N_4 = 168.1 \) and \( N_5 = 224.2 \) Kg/ha.
   N applied in 3 doses.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 10.7 m. \( \times \) 5.5 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Satisfactory; lodging in the month of September due to heavy winds. (ii) Free from pests and diseases but Endrine sprayed on 22.5.63. (iii) Yield of sugarcane. (iv) (a) 1963 to 1964. (b) No. (c) N.A. (v) N.A. (vi) Heavy winds in the month of September. (vii) Nil.

5. RESULTS:
   (i) 738.2 Q/ha. (ii) (a) 193.5 Q/ha. (b) 120.4 Q/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in Q/ha.
Crop: Sugarcane (Kharif).
Site: Govt. Agri. Res. Farm, Borkhera.
Ref: Rj. 64(33).
Type: ‘CM’.

Object: To study the effect of spacings and different levels of N on the yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Paddy. (c) N.A. (ii) Black cotton soil. (iii) 23, 24.2.64. (iv) (a) N.A. (b) Flat planting. (c) 432 four three budded sets/ha. (d) As per treatments. (e) N.A. (v) 67 Kg/ha of P<sub>2</sub>O<sub>5</sub> in furrows, applied at the time of planting. (vi) C<sub>f</sub>—419 (late). (vii) Irrigated. (viii) 2 hoeings with blind hoe and 3 land weedings. (ix) N.A. (x) 20 to 25.4.65.

2. TREATMENTS:
   Main-plot treatments:
   4 spacings between rows: S<sub>1</sub>=61, S<sub>2</sub>=76, S<sub>3</sub>=91 and S<sub>4</sub>=107 cm.
   Sub-plot treatments:
   4 levels of N: N<sub>1</sub>=56, N<sub>2</sub>=112, N<sub>3</sub>=168 add N<sub>4</sub>=224 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 10'4 m. x 5'5 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good; lodging in plots with treatment Nil. (ii) Mild attack of pyrilla and spraying of 0.02% Endrin. (iii) Germination%, height, tiller counts, sugarcane yield, and juice analysis. (iv) (a) 1963—1964 (treatments modified in 1964), (b) No. (c) N.A. (v) (a) Sriganganagar. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

I. Yield.
   (i) 736.1 Q/ha. (ii) (a) 218.3 Q/ha. (b) 141.8 Q/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of sugarcane in Q/ha.

<table>
<thead>
<tr>
<th></th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&lt;sub&gt;3&lt;/sub&gt;</th>
<th>N&lt;sub&gt;4&lt;/sub&gt;</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&lt;sub&gt;1&lt;/sub&gt;</td>
<td>563.3</td>
<td>680.2</td>
<td>926.6</td>
<td>907.6</td>
<td>744.4</td>
</tr>
<tr>
<td>S&lt;sub&gt;2&lt;/sub&gt;</td>
<td>473.4</td>
<td>747.6</td>
<td>974.1</td>
<td>933.4</td>
<td>757.1</td>
</tr>
<tr>
<td>S&lt;sub&gt;3&lt;/sub&gt;</td>
<td>565.0</td>
<td>701.5</td>
<td>799.0</td>
<td>866.3</td>
<td>733.0</td>
</tr>
<tr>
<td>S&lt;sub&gt;4&lt;/sub&gt;</td>
<td>487.5</td>
<td>776.1</td>
<td>810.2</td>
<td>765.5</td>
<td>736.1</td>
</tr>
<tr>
<td>Mean</td>
<td>522.3</td>
<td>726.4</td>
<td>827.5</td>
<td>868.2</td>
<td>736.1</td>
</tr>
</tbody>
</table>

C.D. for N marginal means=119.5 Q/ha.
Crop: Sugarcane (Kharif).

Site: Govt. Agri. Res. Farm, Sriganganagar.

Object: To study the effect of different levels of N and P and different spacings on the yield of Sugarcane.

1. BASAL CONDITIONS:

2. TREATMENTS:
   Main-plot treatments:
   3 spacings between rows: S1 = 61, S2 = 76 and S3 = 91 cm.
   Sub-plot treatments:
   All combinations of (1) and (2).
   (1) 3 levels of N: N1 = 56·0, N2 = 112·1 and N3 = 168·1 Kg/ha.
   (2) 2 levels of P2O5: P1 = 56·0 and P2 = 112·1 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 11·1 m. × 9·1 m. for 62 (32); 12·1 m. × 9·1 m. for 62 (33). (b) 11·1 m. × 9·1 m. for 62 (32); 10·6 m. × 7·6 m. for 62 (33). (v) Nil for 62 (32); N.A. for 62 (33). (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of Sugarcane. (iv) (a) 1962 only. (b) N.A. (c) Results of combined analysis given under 5. (v) and (vi) N.A. (vii) Both the error variances are homogeneous, main-plot Treatments × years interaction is present and sub-plot Treatments × years interaction are absent.

5. RESULTS
   (i) 593·6 Q/ha. (ii) (a) 233·9 Q/ha. (6 d. f. made up of Treatment × years interaction and pooled error). (b) 107·2 Q/ha. (based on 41 d. f. made up of various components of Treatments × years interaction and pooled error). (iii) Main effect of P alone is significant. (iv) Av. yield of cane in Q/ha.

<table>
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C.D. for P marginal means = 51·0 Q/ha.

Crop: Sugarcane (Kharif).

Site: Vidhya Bhawan Rural Institute, Udaipur.

Object: To study the effect of spacings and different levels of N on the yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) N.A. (ii) Red soil. (iii) 7 to 11.3.64; 7 to 9.3.65. (iv) (a) 6 ploughings and planking for 64 (36); 3 ploughings for 65 (44). (b) Flat planting for 64 (36); N.A. for others. (c) 43243 three budded setts/ha. (d) As per treatments. (e) N.A. (v) 67·2 Kg/ha. of P2O5 as Super by drilling and 37 C.L./ha. of F.Y.M. by broadcasting for 64 (36); N.A. for other. (vi) Co. 419. (vii) Irrigated. (viii) 2 weedings and 1 hoeing. (ix) 63 cm. for 64 (36); N.A. for 65 (44). (x) 25 to 29.3.65 for 64 (36); 3, 4.3.66.
2. TREATMENTS:

Main-plot treatments
4 spacings between rows: \( S_1=61, S_2=76, S_3=91 \) and \( S_4=107 \) cm.

Sub-plot treatments
4 levels of N as A/S: \( N_1=56.0, N_2=112.0, N_3=168.0 \) and \( N_4=224.0 \) Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 12 \( \times \) 2 m. x 5.5 m. for 64 (36); 10\( \times \)7 m. x 5.5 m for 65 (44). (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good for 64 (36); Normal for 65 (44). (ii) N.A. for 64 (36); Nil. for 65 (44). (iii) Height tillers count, length and girth of millable cane and yield of cane. (iv) (a) 1954 to 1955. (b) No. (c) Nil. (v) Borkhera and Sri ganganagar. (vi) Nil. (vii) Since the main-plot error variances are heterogeneous and the main-plot treatments \( \times \) years interaction is absent, results of individual years are presented under 5. Results.

5. RESULTS:

64(36)
(i) 1243.7 Q/ha. (ii) (a) 381.9 Q/ha. (b) 239.8 Q/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of cane in Q/ha.

<table>
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<tr>
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C.D. for N marginal means =202.1 Q/ha.

65(44)
(i) 1025 Q/ha. (ii) (a) 136.2 Q/ha. (b) 164.1 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of cane in Q/ha.

<table>
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<tr>
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Crop :- Sugarcane.  
Site :- Govt. Agri. Res. Farm, Borkhera.  
Ref :- Rj. 64(34), 65(48).  
Type :- 'IM'.

Object :- To study the effect of different levels of N and interval of irrigation on the yield of Sugarcane.
1. BASAL CONDITIONS:
(i) (a) N.A. (b) Paddy. (c) N.A. (ii) Black cotton soil. (iii) 8, 9.2.64; 9, 10.2.65. (iv) (a) N.A. for 64 (34); Ploughings and harrowing for 65 (48). (b) Flat planting. (c) 43243 three budded setts/ha. for 64 (34); 73·8 Qfha. (d) 76 em. between rows for 64-(34): 76 em. x30 em. for other. (e) N.A. (v) 67 Kg/ha. of P₂O₅ at the time of planting in furrows for 64 (34); 185 Kg/ha. of P₂O₅ for 65 (48). (vi) Co.419. (vii) Irrigated. (viii) 1 to 2 hoeings and 3 to 4 weedings. (ix) N.A. (x) 1 to 6.5.65; 28.2.66 to 3.3.66.

2. TREATMENTS:
Main-plot treatments
3 premonsoon irrigation interval:  I₁=7, I₂=14 and I₃=21 days interval.
Sub-plot treatments
4 levels of N as A/S: N₁=56, N₂=112, N₃=168 and N₄=224 Kg/ha. N applied in 3 doses at planting and other two doses as top dressing.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12·8 m. x 4·6 m. for 64 (34); 10·7 m. x 5·3 m. for 65 (48). (b) 11·3 m. x 3·1 m. for 64 (34); 9·1 m. x 3·8 m. for 65 (48). (v) 76 em. x 76 em. (vi) Yes.

4. GENERAL:
(i) Good but heavy lodging except in few plots for 64 (34) only. (ii) Heavy incidence of pyrilla which in controlled by spraying 0.5% Endrin twice for 64 (34); Nil for 65 (48). (iii) Germination %, height, tiller counts and yield of cane. (iv) (a) 1964-65. (b) No. (c) Results of combined analysis given under 5. (v) N.A. (vi) Nil. (vii) Both the error variances are homogeneous and main-plot Treatments x years interaction and sub-plot Treatments x years interaction are absent.

5. RESULTS:
(i) 1160·1 Q/ha. (ii) (a) 198·4 Q/ha. (based on 10 d. f. made up of Treatments x years interaction and pooled error). (b) 163·3 Q/ha. (based on 45 d. f. made up of various components of Treatments x years interaction and pooled error). (iii) Main effect of N alone is highly significant. (iv) Av. yield of cane in Q/ha.

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C.D. for N marginal means = 109·6 Q/ha.

Crop :- Sugarcane (Kharif).
Site :- Govt. Agri. Res. Farm, Sriganganagar.
Type :- ‘IM’.
Object :- To study the effect of different levels of N and intervals of irrigation on the yield of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Maize. (c)N.A. (ii) Sandy loam. (iii) 8.3.63. (iv) (a) N.A. (b) Behind the plough. (c) 12056 setts/ha. (d) Between lines 76 cm. (e) 3 budded set per running length of 30 cm. (v) 44·8 Kg/ha. of P₂O₅ as Super and 25 C.L/ha. of F.Y.M. (vi) Co. 312. (vii) Irrigated. (viii) 8 weedings. (ix) N.A. (x) 23.3.64.

2. TREATMENTS:
Main-plot treatments
3 premonsoon irrigation intervals:  I₁=7 days, I₂=14 days and I₃=21 days.
Sub-plot treatments
5 levels of N as A/S: N₀=0, N₁=56, N₂=112, N₃=168 and N₄=224 Kg/ha. N applied in three doses, 1/3 at sowing, 1/3 on 28.5.63 and 1/3 on 16.7.1963.
3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 5 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12.2 m. x 5.3 m. (b) 10.7 m. x 3.8 m. (v) 76 cm. x 76 cm. (vi) Yes.

4. GENERAL:
(i) Normal; lodging in plots with higher doses of N. (ii) Effected by all types of borers; One spray of 0.02% Endrin given. (iii) Yield of Sugarcane. (iv) (a) 1963-contd. (treatments modified in 64). (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Severe attack of frost and low rainfall. (vii) Nil.

5. RESULTS:
(i) 579.5 Q/ha. (ii) (a) 118.2 Q/ha. (b) 88.6 Q/ha. (iii) Main effect of N and interaction I x N are significant. (iv) Av. yield of Sugarcane in Q/ha.

<table>
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<th></th>
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C.D. for N marginal means: 86.3 Q/ha.
C.D. for N means at the same level of I: -149.2 Q/ha.
C.D. for I means at the same levels of N: 177.6 Q/ha.

Crop: Sugarcane.  
Object: To find out the optimum dose of N and pre-monsoon irrigational interval of Sugarcane.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat for 64(38); Guar for 65(46). (c) N.A. for 64(38); Nil for 65(46). (ii) Sandy loam. (iii) N.A.; 27.3.65. (iv) (a) 6 ploughings for 64(38); Ploughing and planking for 65(46). (b) Flat planting in rows for 64(38); Furrow planting for 65(46). (c) N.A. for 64(38); One three budded sett per running 0.3 m. (d) 76 cm. between rows. (e) N.A. (v) 12 C.I./ha. of F.Y.M. for 64(38); 67.2 Kg/ha. of P₂O₅ and 24.7 C.I./ha. of F.Y.M. for 65(46). (vi) Co.312. (vii) Nil. (viii) As per treatments. (ix) Weedings and hoeings. (x) 30.6 cm.; 19 cm. (x) N.A. for 64(38); 12, 13.4.66 for 65(46).

2. TREATMENTS:
Main-plot treatments: 3 pre-monsoon irrigation interval: I₁ = 7; I₂ = 14 and I₃ = 21 days.
Sub-plot treatments: 4 levels of N as A/S: N₁ = 56, N₂ = 112, N₃ = 168 and N₄ = 224 Kg/ha.
N applied in 3 doses, 1/3 at planting and remaining two doses as top dressing.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12.2 m. x 5.3 m. for 64(38); 12.2 m. x 4.6 m. for 65(44). (b) 10.7 m. x 3.8 m. for 64(38); 10.7 m. x 3.1 m. for 65(46). (v) 76 cm. x 76 cm. (vi) Yes.

4. GENERAL:
(i) Normal but lodging in plots of N₁ and N₃ levels for 64(38); Good for 65(46). (ii) N.A. for 64(38); Nil for 65(46). (iii) Height, tiller counts and yield of cane. (iv) (a) 1963 to 1965 [Treatments modified in 1964]. (b) No. (c) Results of combined analysis of 64 and 65 are given under 5. Results. (v) N.A. (vi) Nil. (vii) Both the error variances are homogeneous and main-plot Treatments x years interaction sub-plot Treatments x years interaction are absent.
5. RESULTS:

(i) 750.5 Q/ha.  (ii) (a) 261.3 Q/ha.  (b) 208.1 Q/ha.  (iii) None of the effects is significant.  (iv) Av. yield of cane in Q/ha.

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Crop: Sugarcane (*Kharif*).

Site: Vidhya Bhavan Rural Institute Farm, Udaipur.

Object: To study the effect of different levels of N and interval of irrigation on the yield of Sugarcane.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Fallow.  (c) Nil.  (ii) Clay loam.  (iii) 28.2.63 and 1, 2.3.63.  (iv) (a) Field preparation interculture and 1 ploughing with desi plough and 3 phawra.  (b) Furrow method of planking.  (c) 43243 three budded setts/ha.  (d) Between lines 76 cm.  (e) N.A.  (f) 67 Kg/ha. of P.O. by spreading in the furrows and 138.1 Q/ha. of F.Y.M. by broad casting  (vi) Co.419.  (vii) As per treatments.  (viii) N.A.

2. TREATMENTS:

Main-plot treatments:

- 8 intervals of irrigation: I1=7 days, I2=14 days and I3=21 days.

Sub-plot treatments:

- 4 levels of N as A/S: N0=0, N1=56, N2=112 and N3=168 Kg/ha.

N applied in 3 instalments at planting in top dressing and irrigation applied to a depth of 10 cm.

3. DESIGN:

(i) Split-plot.  (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot.  (b) N.A.  (iii) 3.  (iv) (a) 112.2 m.x 5.3 m.  (b) 10.7 m.x 3.8 m.  (v) 76 cm.x 76 cm.  (vi) Yes.

4. GENERAL:

(i) Good.  (ii) Incidence of pyri!a and borer and control measures—N.A.  (iii) Yield of Sugarcane.  (iv) (a) 1963—contd.  (b) No.  (c) N.A.  (v) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 1024.7 Q/ha.  (ii) (a) 280.5 Q/ha.  (b) 198.0 Q/ha.  (iii) Main effect of 1 alone is significant.  (iv) Av. yield of Sugarcane in Q/ha.

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C.D. for 1 marginal means=317.8 Q/ha.
Crop: Sugarcane.

Site: Vidhya Bhawan Rural Instt., Udaipur.

Object: To study the effect of different levels of N and intervals of irrigation on the yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Pea for 64(37); Maize for 65(45). (c) N.A. (ii) Red soil. (iii) 27, 28, 3.64; 5.4.65. (iv)
   (a) 3 to 10 ploughings. (b) Flat planting for 64(37); N.A. for 65(45). (c) 4340 # three budded setts/ha. (d)
   76 cm. between lines. (e) N.A. (v) 37 C.L/ha. of F.Y.M. for 64(37); 60/0 Kg/ha. of P2O5 and 25 C.L/ha. of
   F.Y.M. for 65(45). (vi) Co.419. (vii) Irrigated. (viii) 2 hand weedicings and 1 hoeing. (ix) 63 cm. for
   64(37); N.A. for 65(45). (x) I to 8.4.65 for 64(37); 27, 28, 3.66 for 65(45).

2. TREATMENTS:
   Main-plot treatments:
   3 intervals of irrigation: \( I_1 = 7 \) days, \( I_2 = 14 \) days and \( I_3 = 21 \) days.
   Sub-plot treatments:
   4 levels of N as A/S: \( N_1 = 56, N_2 = 112, N_3 = 168 \) and \( N_4 = 224 \) Kg/ha.
   N applied in 3 equal doses, 1 at planting and remaining doses as top dressing.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12.2 m. \times
   5.5 m. for 64(37); 12.2 m. \times 4.6 m. for 65(45). (b) 10.7 m. \times 4.0 m. for 64(37); 10.7 m. \times 3.1 m. for
   65(45). (v) 76 cm. \times 76 cm. (vi) Yes.

4. GENERAL:
   (i) Very good. (ii) Nil. (iii) Height, tiller counts and yield of cane. (iv) (a) 1964 to 1965. (b) No. (c)
   Nil. (v) Sriganganagar. (vi) Nil. (vii) Since the sub-plot error variances are heterogeneous results of
   individual years are presented under 5. Results.

5. RESULTS:

64(37)
   (i) 2299.0 Q/ha. (ii) (a) 265.0 Q/ha. (b) 242.9 Q/ha. (i) Main effect of N alone is highly significant. (iv)
   Av. yield of cane in Q/ha.
   \[
   \begin{array}{cccc|c}
   & N_1 & N_2 & N_3 & N_4 & \text{Mean} \\
   I_1 & 2073.5 & 2090.6 & 2245.5 & 2725.2 & 2283.7 \\
   I_2 & 1946.1 & 1907.5 & 2025.9 & 3077.1 & 2239.2 \\
   I_3 & 2224.8 & 2418.6 & 2274.1 & 2579.6 & 2374.3 \\
   \text{Mean} & 2081.5 & 2138.9 & 2181.8 & 2794.0 & 2299.0 \\
   \end{array}
   \]
   C.D. for N marginal means=240.6 Q/ha.

65(45)
   (i) 1136 Q/ha. (ii) (a) 423.0 Q/ha. (b) 150.0 Q/ha. (iii) Main effect of N alone is highly significant. (iv)
   Av. yield of cane in Q/ha.
   \[
   \begin{array}{cccc|c}
   & N_1 & N_2 & N_3 & N_4 & \text{Mean} \\
   I_1 & 933 & 1071 & 1353 & 1143 & 1125 \\
   I_2 & 748 & 979 & 1112 & 1129 & 992 \\
   I_3 & 1087 & 1153 & 1502 & 1420 & 1290 \\
   \text{Mean} & 923 & 1068 & 1322 & 1231 & 1136 \\
   \end{array}
   \]
   C.D. for N marginal means=148.8 Q/ha.
Crop: Sugarcane.  
Site: Govt. Agri. Res. Farm, Borkhera.

Object: To determine the optimum doses of N and pre-monsoon irrigations for different promising varieties.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) Black cotton soil. (iii) 18, 19, 26, 65. (iv) (a) Ploughing and harrowing. (b) Flat planting. (c) 64'5 to 73'8 Q/ha. (d) 76 cm. x 30 cm. (e) N.A. (v) 75 Kg/ha. of P₂O₅. (vi) and (vii) As per treatments: (viii) 4 weedings and hoeing. (ix) N.A. (x) 11 to 16.46.

2. TREATMENTS:
   Maia-plot treatments:
   2 irrigational schedule: I₁=Irrigation at 10 days and I₂=Irrigation at 20 days.

Sub-plot treatments:
   All combinations of (1) and (2).
   (1) 4 varieties: V₁=Co. 527, V₂=Co. 997, V₃=Co. 1007 and V₄=Co. 1111.
   (2) 2 levels of N: N₁=112'1 and N₂=224'2 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication, 8 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 12'2 m. x 4'6 m. (b) 10'7 m. x 3'1 m. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Shoot height and tillering and yield of cane. (iv) (a) 1965 N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 646'2 Q/ha. (ii) (a) 87'6 Q/ha. (b) 167'4 Q/ha. (iii) Main effect of N is highly significant and main effect of V is significant. (iv) Av. yield of sugarcane in Q/ha.

<table>
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<tr>
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<th>N₂</th>
<th>Mean</th>
<th>V₁</th>
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<th>V₃</th>
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C.D. for N marginal means=84'4 Q/ha.
C.D. for V marginal means=119'5 Q/ha.

Crop: Sugarcane (Kharif).
Site: Govt. Agri. Res. Farm, Sriganganagar.

Object: To study the effect of different depths of planting and irrigations on the yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) Sandy loam. (iii) 20.3.63. (iv) (a) N.A. (b) Behind the plough. (c) N.A. (d) Between lines 76 cm. (e) 3 budded set per running 30 cm. (v) 112 Kg/ha. of P₂O₅, 44'8 Kg/ha. of K₂O (½ at the time of sowing and ½ at the time of monsoon) and 25 C.L/ha. of F.Y.M. (vi) Co.312. (vii) Irrigated. (viii) 6 weedings. (ix) N.A. (x) 15.4.64.
2. TREATMENTS:

Main-plot treatments:
3 times of irrigations: \( I_1 = \text{Planting without palewa and 1st irrigation after 3 weeks of planting} \), \( I_2 = \text{Planting without palewa and 1st irrigation after planting} \), \( I_3 = \text{Planting with palewa} \).

Sub-plot treatments:
3 depths of sowing below the surface: \( D_1 = 5 \), \( D_2 = 10 \), \( D_3 = 15 \) cm.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 12.2 m. \( \times \) 4.6 m. (b) 10.7 m. \( \times \) 3.1 m. (v) 76 cm. \( \times \) 76 cm. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Crop was affected by all types of borers. (iii) Yield of Sugarcane. (iv) (a) and (b) No. (c) N.A. (v) N.A. (vi) Low rainfall and severe frost. (vii) Nil.

5. RESULTS:
(i) 396.3 Q/ha. (ii) (a) 142.6 Q/ha. (b) 118.7 Q/ha. (iii) None of the effects is significant. (iv) Av. yield of Sugarcane in Q/ha.

<table>
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<td>Mean</td>
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Crop :- Sugarcane (Kharif).
Site :- Govt. Agri. Res. Farm, Sriganganagar.

Object :- To find out the manurial doses and irrigational schedule for Sugarcane.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Cotton. (c) 37 C.L./ha. of F.Y.M. (ii) Sandy loam. (iii) 26.2.62. (iv) (a) N.A. (b) As per treatments. (c) N.A. (d) Row to row 76 cm. (e) N.A. (v) N.A. (vi) Co 312. (vii) As per treatment. (viii) Hoeing and weedings. (ix) N.A. (v) 23.2.63.

2. TREATMENTS:
Main-plot treatments:
2 depth of planting: \( D_1 = \text{Shallow} \) and \( D_2 = \text{Deep planting} \).

Sub-plot treatments:
3 irrigation interval: \( I_1 = 14 \), \( I_2 = 21 \), \( I_3 = 28 \) days.

Sub-sub-plot treatments:
3 levels of N: \( N_1 = 67 \), \( N_2 = 134 \) and \( N_3 = 201 \) Kg/ha.

3. DESIGN:
(i) Split-split-plot. (ii) (a) 2 main-plots/block ; 3 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) N.A.
(iii) 2. (iv) (a) 12.1 m. \( \times \) 9.2 m. (b) 10.6 m. \( \times \) 7.6 m. (v) 76 cm. \( \times \) 76 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of sugarcane. (iv) (a) 1962 only. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:
(i) 789.2 Q/ha. (ii) (a) 201.1 Q/ha. (b) 119.2 Q/ha. (c) 100.2 Q/ha. (iii) Main effect of I alone is significant. (iv) Av. yield of cane in Q/ha.

Ref :- Rj. 62(31).
Type :- ‘ICM’.
Object: To find out the efficacy of weedicides with and without weeding by implement on the yield of Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) N.A. for 62(30), 64(32); Nil for 63(97). (b) Jowar for 62(30); Sarson for 63(97); Paddy for 64(32).
   (c) 44.8 Kg/ha. of N as A/S for 62(30); G.M. with Sunai for 63(97); N.A. for 64(32).
   (e) Black cotton soil.
   (iv) (a) N.A. (b) In furrows for 62(30), 63(27); Flat planting for 64(32).
   (c) 42343 (3 budded) setts/ha. (d) 76 cm. between rows.
   (e) I. (v) N.A. for 62(30); 134 Kg/ha. of N half at the time of planting and half as top dressing for 63(97) and 64(32) with an additional dose of 67 Kg/ha. of P₂O₅ at the time of planting for 64(32). (vi) C 0.419. (vii) Unirrigated for 62(30); Irrigated for others. (viii) As per treatments.
   (ix) N.A. (x) February, 1963; 14 to 16.2.1964; 27 to 30.4.1965.

2. TREATMENTS:
   Main-plot treatments:
   3 cultural treatments: C₀=Control, C₁=Hand weeding and C₂=Weeding by bullocks driven implement.
   Sub-plot treatments:
   4 weedicidal treatments: W₀=No weedicide, W₁=Pre-emergence spraying of 2,4-D, W₂=Post emergence of 2, 4-D, W₃=Pre+Post emergence spraying of 2, 4-D.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 4 sub-plots/main-plot. (b) N.A. (iii) 2 for 62(30); 3 for others.
   (iv) (a) N.A. for 62(30); 10'7 m. x 4'6 m. for 63(97); 10'1 m. x 4'6 m. for 64(32). (b) 6'5 m. x 4'6 m. for 62(30); 9'2 m. x 3'1 m. for 63(97); 8'5 m. x 3'1 m. for 64(32).
   (v) N.A. for 62(30); 76 cm. x 76 cm. for 63(97). (vi) Yes.

4. GENERAL:
   (i) N.A. for 62(30): Good for others. (ii) N.A. for 62(30); Endrin Sprayed for 63(97); Incidence of pyrilla controlled by spraying 0.02% Endrin. (iii) Yield of cane for 62(30), 63(97); yield of cane and germination % for 64(32). (iv) 1962–1964. (b) No. (c) Nil. (v) 3. (vi) N.A. (vii) Both the error variances are homogeneous and main-plot treatments x years interaction and sub-plot Treatments x years interaction are present.

5. RESULTS:
   (i) 651.8 Q/ha. (ii) 95.9 Q/ha, [based on 4 d.f. made up of treatments x years interaction]. (b) 101.8 Q/ha, [based on: 18 d.f. made up of various components of treatments x years interaction]. (iii) Main effect of C alone is significant. (iv) Av. yield of cane in Q/ha.

<table>
<thead>
<tr>
<th></th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
<th>N₁</th>
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<th>N₃</th>
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<td>853.0</td>
<td>699.4</td>
<td>706.3</td>
<td>763.2</td>
<td>713.5</td>
<td>782.8</td>
<td>753.2</td>
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<tr>
<td>Mean</td>
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<td>745.1</td>
<td>483.1</td>
<td>749.6</td>
<td>789.7</td>
<td>828.4</td>
<td>789.2</td>
</tr>
</tbody>
</table>

C.D. for 1 marginal means = 135.2 Kg/ha.

Crop :- Sugarcane.
Site :- Govt. Agri. Farm, Borkhera.
Ref :- Rj. 62(30), 63(97), 64(32).
Type :-'DC'.

Object : :- To find out the efficacy of weedicides with and without weeding by implement on the yield of Sugarcane.
Wo \( w_1 \) Wa

Mean

| \( C_6 \) | 524·0 | 506·1 | 505·6 | 566·9 | 525·6 |
| \( C_7 \) | 741·4 | 731·4 | 809·9 | 716·5 | 749·8 |
| \( C_8 \) | 664·8 | 770·8 | 653·1 | 630·4 | 679·8 |

| Mean | 643·4 | 669·4 | 656·2 | 637·9 | 651·8 |

C.D. for C marginal mean = 108·7 Q/ha.

64(31).

Germination analysis.

(i) 45·85 degrees, (ii) (a) 2·99 degrees. (b) 2·53 degrees. (iii) None of the effects is significant. (iv) Av. germination in degrees.

| \( W_e \) | \( W_1 \) | \( W_2 \) | \( W_3 \) | Mean |
| \( C_6 \) | 47·34 | 47·70 | 45·84 | 45·90 | 46·70 |
| \( C_7 \) | 42·10 | 46·92 | 44·00 | 45·32 | 44·58 |
| \( C_8 \) | 45·78 | 45·32 | 47·92 | 46·09 | 46·28 |

| Mean | 45·07 | 46·65 | 45·92 | 45·77 | 45·85 |

Crop :- Cotton (Kharif).

Site :- Govt. Agri. Res. Farm, Borkhera.

Ref :- Rj. 65(19).

Type :- 'M'.

Object :- To determine the optimum time of application for N fertilizers for Cotton crop.

1. BASAL CONDITIONS :

(i) (a) No. (b) and (c) N.A. (ii) Class II. (iii) 23·5.65, (iv) (a) Bukhering and planting. (b) Drilling. (e) 19·8 Kg/ha. (d) 76 cm. between lines. (e) N.A. (v) N.A. (vi) C Indore—1. (vii) Irrigated. (viii) 4 hoeings. (ix) N.A. (x) Five pickings from 23.9.65 to 29.12.65.

2. TREATMENTS:

All combinations of (1) and (2) + a Control (2 plots).

(1) 2 levels of N : \( N_1 = 61·8 \) and \( N_2 = 123·6 \) Kg/ha.

(2) 5 times of application of \( N_1 \) : \( T_1 = \) Full at sowing, \( T_2 = \) Full at square formation, \( T_3 = \) \( 1 \) at sowing \( + \) \( 1 \) at square formation, \( T_4 = \) \( 1 \) at sowing \( + 2/3 \) at square formation and \( T_5 = 2/3 \) at sowing \( + 1 \) at square formation.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) and (b) 6·1 m. x 4·6 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Dusting of BHC and Endrin spraying against ball worms. (iii) Stand, height, no. of branches and yield of Kapas. (iv) 1965 only. (b) No. (c) Nil. (v) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 851 Kgf/ha. (ii) 140·6 Kg/ha. (iii) Main effect of N and 'control vs. others' are highly significant. (iv) Av. yield of Kapas in Kg/ha.
Crop: Cotton (Kharif).

Site: Govt. Agri. Res. Farm, Sriganganagar. Type: 'M'.

Object: To study the effect of various levels of N, P, K on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) N.A. for 63(12); Nil for others. (b) Sugarcane for 63(12); Wheat for 64(84); Fallow for 65(43).
   (c) 112 kg/ha. of N as A/S +112'1 kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super for 62(12); Nil for others.
   (ii) (a) N.A. for 63(12); 4 cultivation with tractor for 64(84); Ploughing and planking for 65(43).
   (b) N.A. for 63(12); Line sowing; Drilling. (c) 13 kg/ha. (d) N.A.
   (iii) 20.4.1963; 25.5.1964; 26.5.1965. (iv) (a) N.A. for 63(12); 4 cultivation with tractor for 64(84); Ploughing and planking for 65(43).
   (b) N.A. for 63(12); Line sowing; Drilling. (c) 13 kg/ha. (d) N.A.
   (v) N.A. for 63(12), 65(43); Nil for 64(84). (vi) 320-F. (American). (vii) Irrigated. (viii) 3 weedings for 63(12); 1 thinning for 64(84). (ix) 2 hoeings and weedings for 65(43) N.A.; 22 cm. N.A.

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>=44'8 and N<sub>2</sub>=89'7 kg/ha.
   (2) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super: P<sub>0</sub>=0, P<sub>1</sub>=33'6 and P<sub>2</sub>=67'2 kg/ha.
   (3) 3 levels of K<sub>2</sub>O as Mur. Pot.: K<sub>0</sub>=0, K<sub>1</sub>=33'6 and K<sub>2</sub>=67'2 kg/ha.

3. DESIGN:
   (i) 3<sup>rd</sup> Fact. confd. (ii) (a) 9 plots block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) 9'2 m. x 5'5 m. (b)
   9'2 m. x 3'7 m. for 63(12), 64(84); 7'4 m. x 3'7 m. for 65(43). (v) 91 cm. on either side along breadth for
   63(12), 64(84); 91 cm. x 91 cm. for 65(43). (vi) Yes.

4. GENERAL:
   (i) Normal for 63(12), 64(84); Poor for 65(43). (ii) N.A. for 63(12), 65(43); Spraying of Endrin (20% EC)
   at 1'2 litres/ha. for control of jassids in 64(84). (iii) Yield of Kapas. (iv) a) 1953 to 1965. (b) -.
   (c) Results of combined analysis given under 5. (v) and (vi) Nil. (vii) Error variances are heterogeneous
   and treatments x years interaction is present.

5. RESULTS:
   (i) 1161 Kg/ha. (ii) 473'1 Kg/ha. (based on 28 d.f. made up of interactions of N, P, K, N X P, N X K with
   years). (iii) Main effect of N alone highly significant. (iv) Av. yield of Kapas in Kg/ha.

<table>
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C.D. for N marginal means=186'5 Kg/ha.
Crop: Cotton (Kharif).

Site: Govt. Agri. Res. Farm, Sriganganagar.

Object: To study the effect of N, P and K alone and in combination on Cotton.

1. BASAL CONDITIONS:
   (i) (a) N.A. for 64(40), 61(40); Nil for 62(107).
   (b) Sugarcane (Ratoon) for 60(40); Cotton for 61(40); Wheat for 62(107).
   (c) 168'1 Kg/ha. of N+112'1 Kg/ha. of P$_2$O$_5$ for 60(40), 61(40); N.A. for 62(107).
   (ii) Sandy loam. (iii) 2.6'60; 27.5'61; 20.5'62. (iv) (a) 3 to 5 ploughings. (b) N.A. (c) 13 Kg/ha.
   (d) 91 cm. x 30 cm. (e) N.A. (v) N.A. (vi) 320-F (American). (vii) Irrigated. (viii) 2 weedings and hoeings.
   (ix) N.A. (x) 3 pickings on 7.11.60, 9.12.60, 18.1.61 for 60(40); 15.11.61, 9.12.61 and 30.12.61 for 61(40); 21.12.62 and 16.1.63 for 62(107).

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 2 levels of N as A/S: N$_0$=0 and N$_1$=44'8 Kg/ha.
   (2) 2 levels of P$_2$O$_5$ as Super: P$_0$=0 and P$_1$=67'2 Kg/ha.
   (3) 2 levels of K$_2$O as Mur. Pot.: K$_0$=0 and K$_1$=67'2 Kg/ha.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) N.A. (iii) 4. (iv) (a) 12'2 m. x 4'3 m. (b) 12'2 m. x 2'6 m. (v) 85 cm.
   on either side along breadth. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. for 60(40); Nil for others. (iii) Yield of Kapas. (iv) (a) 1960 to 1962. (b) No. (c)
   Results of combined analysis are given under 5. (v) and (vi) Nil. (vii) Error variances are homogeneous,
   Treatments x years interaction is absent.

5. RESULTS:
   (i) 1553 Kg/ha. (ii) 251'3 Kg/ha. [based on 75 d.f. made up of interaction of various components of treat­
   ments with years and pooled error]. (iii) Main effect of N alone is highly significant. (iv) Av. yield of Kapas
   in Kg/ha.

<table>
<thead>
<tr>
<th>P$_0$</th>
<th>P$_1$</th>
<th>K$_0$</th>
<th>K$_1$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$_0$</td>
<td>1355</td>
<td>1359</td>
<td>1316</td>
<td>1408</td>
</tr>
<tr>
<td>N$_1$</td>
<td>1732</td>
<td>1709</td>
<td>1753</td>
<td>1737</td>
</tr>
<tr>
<td>Mean</td>
<td>1573</td>
<td>1534</td>
<td>1534</td>
<td>1572</td>
</tr>
<tr>
<td>K$_0$</td>
<td>1558</td>
<td>1511</td>
<td>1534</td>
<td>1572</td>
</tr>
<tr>
<td>K$_1$</td>
<td>1589</td>
<td>1557</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   C.D. for N marginal means=102'3 Kg/ha.
2. TREATMENTS:
9 manurial treatments: $M_0$ = Control, $M_1$ = 67.2 Kg/ha. of N as Mustard cake, $M_2$ = 67.2 Kg/ha. of N as Taramira, $M_3$ = 67.2 Kg/ha. of A/S, $M_4$ = 67.2 Kg/ha. of P$_2$O$_5$ as Super, $M_5$ = 89.7 Kg/ha. of K$_2$O as Mur. Pot., $M_6$ = 67.2 Kg/ha. of N as Mustard cake + 67.2 Kg/ha. of P$_2$O$_5$ as Super + 89.7 Kg/ha. of K$_2$O as Mur. Pot., $M_7$ = $M_2$ + $M_3$ + $M_5$ and $M_8$ = $M_4$ + $M_5$.

3. DESIGN:
(i) R.B.D. (ii) (a) 9 plots/block and 6 blocks/replication. (iii) 1. (iv) (a) and (b) 9 m. x 5.5 m. (v) 91 cm. on either side along breadth. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Yield of Kapas. (iv) (a) 1960 to 1961. (b) N.A. (c) Results of combined analysis are given under 5. (v) and (vi) Nil. (vii) Error variances are homogeneous and Treatments x years interaction is present.

5. RESULTS:
(i) 1011 Kg/ha. (ii) 412.6 Kg/ha. (based on 8 d.f. made up of Treatments x years interaction). (iii) Treatment differences are not significant. (iv) Av. yield of Kapas in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$M_0$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
<th>$M_5$</th>
<th>$M_6$</th>
<th>$M_7$</th>
<th>$M_8$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1041</td>
<td>1162</td>
<td>1228</td>
<td>996</td>
<td>906</td>
<td>922</td>
<td>902</td>
<td>949</td>
<td>990</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).  
Site :- M.A.E. Centre, Sriganganagar.  
Ref :- Rj. 69, 61, 62, 63, 64(M.A.E).  
Type :-

Object :- Type II : To study the effects of different levels of N, P, K and F.Y.M. on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Sandy loam. (iii) N.A. 20.5.61, N.A., 19.5.63 and 12.6.64. (iv) (a) 2 ploughings and 3 harrowings and disking followed by planking. (b) N.A. (c) 11.2 Kg/ha. (d) 1.2 m. between rows. (e) N.A. (v) Nil. (vi) F. 320 for 61 and 63, Local for 64, N.A. for others. (vii) Irrigated. (viii) 3 weedings and hoeing. (ix) 3 cm. for 61 and N.A. for others. (x) N.A., 9.11.61 to 29.12.61, N.A., 28.11.63 and 12.9.64.

2. TREATMENTS:
All combinations of (1), (2), (3) and (4)
(1) 3 levels of N as A/S : N$_0$ = 0, N$_1$ = 22.4 and N$_2$ = 44.8 Kg/ha.
(2) 3 levels of P$_2$O$_5$ as Super : P$_0$ = 0, P$_1$ = 22.4 and P$_2$ = 44.8 Kg/ha.
(3) 3 levels of K$_2$O as Mur. Pot. : K$_0$ = 0, K$_1$ = 22.4 and K$_2$ = 44.8 Kg/ha.
(4) 2 levels of F.Y.M. : F$_0$ = 0 and F$_1$ = 5600 Kg/ha.
N and K broadcasted and P drilled at sowing.

3. DESIGN:
(i) $3^2$ x 2 Fact. confd. (ii) (a) 9 plots/block and 6 blocks/replication. (b) N.A. (iii) 1. (iv) (a) and (b) 8.8 m. x 3.6 m. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of white ants. (iii) Yield of Kapas. (iv) (a) 1960-64. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) Error variances are heterogeneous and interaction of Treatments x years is present, excepting (F x K x years) interaction.

5. RESULTS:
(i) 1274 Kg/ha. (ii) 379.9 Kg/ha. [76 d.f. made up of interaction of treatments components, F, N, P, K ; F x N, F x P, N x P, N x K, P x K, with years]. (iii) Main effects of F, N, P, K are highly significant. Interactions N x P, N x K are significant. (iv) Av. yield of Kapas in Kg/ha.
<table>
<thead>
<tr>
<th></th>
<th>N_0</th>
<th>N_1</th>
<th>N_3</th>
<th>P_0</th>
<th>P_1</th>
<th>P_3</th>
<th>K_0</th>
<th>K_1</th>
<th>K_3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F_0</td>
<td>930</td>
<td>1195</td>
<td>1372</td>
<td>1069</td>
<td>1179</td>
<td>1329</td>
<td>1138</td>
<td>1197</td>
<td>1242</td>
<td>1166</td>
</tr>
<tr>
<td>F_1</td>
<td>1129</td>
<td>1423</td>
<td>1594</td>
<td>1291</td>
<td>1411</td>
<td>1444</td>
<td>1330</td>
<td>1371</td>
<td>1446</td>
<td>1382</td>
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<tr>
<td>Mean</td>
<td>1020</td>
<td>1309</td>
<td>1483</td>
<td>1180</td>
<td>1295</td>
<td>1386</td>
<td>1234</td>
<td>1284</td>
<td>1344</td>
<td>1274</td>
</tr>
</tbody>
</table>

C.D. for F marginal means = 112.9 Kg/ha.
C.D. for N, P or K marginal means = 92.2 Kg/ha.
C.D. for means in the body of N x P or N x K table = 195.7 Kg/ha.

60(MAE)

<table>
<thead>
<tr>
<th></th>
<th>K_0</th>
<th>K_1</th>
<th>K_2</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>F_0</td>
<td>600</td>
<td>624</td>
<td>654</td>
<td>26</td>
</tr>
<tr>
<td>F_1</td>
<td>777</td>
<td>800</td>
<td>778</td>
<td>785</td>
</tr>
<tr>
<td>Mean</td>
<td>683</td>
<td>712</td>
<td>716</td>
<td>706</td>
</tr>
</tbody>
</table>

S.E. of body of table = 52.9 Kg/ha.

61(MAE)

<table>
<thead>
<tr>
<th></th>
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<th>K_2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F_0</td>
<td>1430</td>
<td>1549</td>
<td>1356</td>
<td>1445</td>
</tr>
<tr>
<td>F_1</td>
<td>1700</td>
<td>1673</td>
<td>1722</td>
<td>1698</td>
</tr>
<tr>
<td>Mean</td>
<td>1565</td>
<td>1611</td>
<td>1539</td>
<td>1572</td>
</tr>
</tbody>
</table>

S.E. of body of table = 84.8 Kg/ha.

62(MAE)

<table>
<thead>
<tr>
<th></th>
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<th>K_2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F_0</td>
<td>1443</td>
<td>1462</td>
<td>1549</td>
<td>1485</td>
</tr>
<tr>
<td>F_1</td>
<td>1517</td>
<td>1698</td>
<td>1841</td>
<td>1685</td>
</tr>
<tr>
<td>Mean</td>
<td>1480</td>
<td>1580</td>
<td>1695</td>
<td>1585</td>
</tr>
</tbody>
</table>

S.E. of body of table = 63.4 Kg/ha.

63(MAE)

<table>
<thead>
<tr>
<th></th>
<th>K_1</th>
<th>K_2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>F_0</td>
<td>521</td>
<td>566</td>
<td>619</td>
</tr>
<tr>
<td>F_1</td>
<td>674</td>
<td>716</td>
<td>811</td>
</tr>
<tr>
<td>Mean</td>
<td>598</td>
<td>641</td>
<td>715</td>
</tr>
</tbody>
</table>

S.E. of body of table = 25.4 Kg/ha.
Crop :- Cotton.
Site :- M.A.E. Centre, Sriganganagar.
Object :- Type (v) (a) :- To study the effect of different methods of application of N on the yield of Cotton.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) Sandy loam (iii) 22.5.62; 7.7.63; 21.4.64. (iv) and (v) Nil. (vi) F=320. (vii) Irrigated. (viii) and (ix) Nil. (x) N.A.; 16.12.63; 6.1.65; N.A.

2. TREATMENTS :
All combinations of (1) and (2) -a control
(1) 2 levels of N as A/S : N₁=60 and N₂=120 Kg/ha.
(2) 5 methods of application of N : M₁=Broadcast at sowing. M₂=Placement of fertiliser one week before sowing about 12.5 cm. deep by plough sole method. M₃=Placement of fertiliser in the same line as seed by seed cum fertiliser drill. M₄=Placement of fertiliser about 4 cm. below the seed by seed cum fertiliser drill and M₅=Band placement of fertilisers about 5 cm. below and away from the seed.

3. DESIGN :
(i) R.B.D. (ii) 11. (b) N.A. (iii) 4. (iv) (a) and (b) N.A. (v) Yes.

4. GENERAL :
(i) Good. (ii) Nil. (iii) Yield of Kapas. (iv) (a) 1962-65 [1965 N.A]. (b) No. (c) Results of combined analysis are presented under 5. Results. (v) N.A. (vi) Nil₃ (vii) Pooled results are given for 62-65.

5. RESULTS :
(i) 1491 Kg/ha. (ii) 108.0 Kg/ha. (iii) Main effects of M and N are highly significant. (iv) Av. yield of Kapas in Kg/ha.

Control=976 Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1503</td>
<td>1552</td>
<td>1694</td>
<td>1476</td>
<td>1488</td>
</tr>
</tbody>
</table>
| C.D. for M marginal means=108.0 Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1458</td>
<td>1628</td>
</tr>
</tbody>
</table>
| C.D. for N means=68.0 Kg/ha.
Crop : Cotton

Ref : Rj. 62, 63, 64, 65 (S.F.T.) for Pali and 63, 64, 65 (S.F.T.) for Sriganganagar.

Site : Pali and Sriganganagar

Type : 'M'.

Object : To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients (Type : A).

1. BASAL CONDITIONS :
   (i) N.A. (ii) Grey brown ; Desert soil. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS :
   8 manurai treatments
   O = Control (no manure)
   N_1 = 56 Kg/ha of N
   N_2 = 112 Kg/ha of N
   P_1 = 33.6 Kg/ha of P_20_5
   N_1 P_1 = 56 Kg/ha of N + 33.6 Kg/ha. of P_20_5
   N_2 P_1 = 112 Kg/ha of N + 33.6 Kg/ha. of P_20_5
   N_2 P_2 = 112 Kg/ha of N + 67.2 Kg/ha. of P_20_5
   N_1 P_2 K_1 = 112 Kg/ha of N + 67.2 Kg/ha. of P_20_5 + 33.6 Kg/ha of K_20
   N applied as A/S, P_20_5 as Super and K_20 as Mur.

3. DESIGN :
   A selected district is divided into four agriculturally homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50 - 100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A_1, 11 of type A_2, 11 of type A_3 and 3 are of type C. The eleven experiments under type A_1, A_2 and A_3 are distributed as 3 on a kharif cereal, 3 on a rabi cereal, 3 on a cash crop and 2 on oilseed. All the three type-C experiments are conducted on a legume crop. For the purpose of conducting the A_1, A_2 and A_3 experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type A_1, A_2 and A_3 are laid out. For conducting the three type-C trials three villages are randomly selected in each block.

4. GENERAL :
   (i) and (iii) N.A. (iv) (a) Nil, (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS :

Pali
62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>N_2</th>
<th>P_1</th>
<th>N_1 P_1</th>
<th>N_2 P_1</th>
<th>N_1 P_2</th>
<th>N_2 P_2</th>
<th>N_1 P_2 K_1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>178</td>
<td>197</td>
<td>61</td>
<td>100</td>
<td>220</td>
<td>198</td>
<td>404</td>
<td>61.6</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 589 Kg/ha.; No. of trials = 5.

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>N_2</th>
<th>P_1</th>
<th>N_1 P_1</th>
<th>N_2 P_1</th>
<th>N_1 P_2</th>
<th>N_2 P_2</th>
<th>N_1 P_2 K_1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>85</td>
<td>164</td>
<td>92</td>
<td>-27</td>
<td>121</td>
<td>191</td>
<td>295</td>
<td>56.0</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 450 Kg/ha.; No. of trials = 3.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N_1</th>
<th>N_2</th>
<th>P_1</th>
<th>N_1 P_1</th>
<th>N_2 P_1</th>
<th>N_1 P_2</th>
<th>N_2 P_2</th>
<th>N_1 P_2 K_1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>104</td>
<td>225</td>
<td>20</td>
<td>187</td>
<td>245</td>
<td>311</td>
<td>270</td>
<td>47.5</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 548 Kg/ha.; No. of trials = 5.
Crop :- Cotton.  
Site :- (District) Banswara.  
Ref :- Rj. 62, 63, 65(S.F.T.)  
Type :- 'M'.

Object :- To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients (Type : A.).

1. BASAL CONDITIONS:
   (i) N.A.  (ii) Red and Yellow.  (iii) to (vi) N.A.  (vii) Unirrigated.  (viii) to (x) N.A.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₂P₁</th>
<th>N₃P₁</th>
<th>N₁P₂</th>
<th>N₂P₂</th>
<th>N₃P₂</th>
<th>K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>357</td>
<td>443</td>
<td>00</td>
<td>236</td>
<td>346</td>
<td>480</td>
<td>510</td>
<td></td>
<td></td>
<td></td>
<td>82-4</td>
</tr>
</tbody>
</table>

Control yield=646 Kg/ha.; No. of trials=3.

Sriganganagar

63(S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₂P₁</th>
<th>N₃P₁</th>
<th>N₁P₂</th>
<th>N₂P₂</th>
<th>N₃P₂</th>
<th>K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>212</td>
<td>453</td>
<td>40</td>
<td>321</td>
<td>514</td>
<td>647</td>
<td>659</td>
<td></td>
<td></td>
<td></td>
<td>39-6</td>
</tr>
</tbody>
</table>

Control yield=1032 Kg/ha.; No. of trials=11.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₂P₁</th>
<th>N₃P₁</th>
<th>N₁P₂</th>
<th>N₂P₂</th>
<th>N₃P₂</th>
<th>K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>213</td>
<td>375</td>
<td>64</td>
<td>288</td>
<td>394</td>
<td>529</td>
<td>617</td>
<td></td>
<td></td>
<td></td>
<td>47-5</td>
</tr>
</tbody>
</table>

Control yield=540 Kg/ha.; No. of trials=10.

65(S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₂P₁</th>
<th>N₃P₁</th>
<th>N₁P₂</th>
<th>N₂P₂</th>
<th>N₃P₂</th>
<th>K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>156</td>
<td>453</td>
<td>28</td>
<td>107</td>
<td>336</td>
<td>448</td>
<td>461</td>
<td></td>
<td></td>
<td></td>
<td>165-5</td>
</tr>
</tbody>
</table>

Control yield=690 Kg/ha.; No. of trials=7.

3. DESIGN:
   Same as in type A (Irrigated) on page 293.

4. GENERAL:
   (i) to (iii) N.A.  (iv) (a) 1962 to 1966 [1964—N.A.].  (b) and (c) N.A.  (v) to (vii) N.A.
5. RESULTS:

62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₂P₁</th>
<th>N₁P₂</th>
<th>N₂P₂</th>
<th>N₃P₃</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>44</td>
<td>77</td>
<td>300</td>
<td>108</td>
<td>120</td>
<td>140</td>
<td>116</td>
<td>139.6</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 262 Kg/ha.; No. of trials = 5.

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₂P₁</th>
<th>N₁P₂</th>
<th>N₂P₂</th>
<th>N₃P₃</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>166</td>
<td>140</td>
<td>43</td>
<td>166</td>
<td>164</td>
<td>221</td>
<td>221</td>
<td>29.5</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 276 Kg/ha.; No. of trials = 5.

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>N₂</th>
<th>P₁</th>
<th>N₁P₁</th>
<th>N₂P₁</th>
<th>N₁P₂</th>
<th>N₂P₂</th>
<th>N₃P₃</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>205</td>
<td>175</td>
<td>45</td>
<td>265</td>
<td>240</td>
<td>380</td>
<td>380</td>
<td>39.5</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 90 Kg/ha.; No. of trials = 2.

Crop = Cotton.

Site = District: Pali, Sriganganagar and Banswara.

Object:—To study response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients (Type: 'M').

1. BASAL CONDITIONS:

(i) to (c) N.A.
(ii) Grey brown; Desert soil; Red and yellow.
(iii) to (vi) N.A.
(vii) Irrigated.
(viii) to (x) N.A.

2. TREATMENTS:

8 manurials treatments:

O = Control (no manure).
N₁=56 Kg/ha. of N.
P₁=33.6 Kg/ha. of P₃O₅.
P₂=67.2 Kg/ha. of P₃O₅.
N₁P₁=56 Kg/ha. of N+33.6 Kg/ha. of P₃O₅.
N₁P₂=56 Kg/ha. of N+67.2 Kg/ha. of P₃O₅.
N₁P₃=112 Kg/ha. of N+67.2 Kg/ha. of P₃O₅.
N₁P₃K₁=112 Kg/ha. of N+67.2 Kg/ha. of P₃O₅+67.2 Kg/ha. of K₂O.
N applied as A/S, P₃O₅ as Super and K₂O as Mur. Pot.

3. DESIGN:

Same as in type A₁ (irrigated) 293.

4. GENERAL:

(i) to (iii) N.A.
(iv) (a) 1962 to 1966 for Pali, 1963 to 1966 for Sriganganagar and 1965 only for Banswara.
(b) and (c) N.A.
(v) to (vii) N.A.
5. RESULTS:

Pall

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P1</th>
<th>N2P2</th>
<th>N1P4K4</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Cotton in Kg/ha.</td>
<td>62 (S.F.T.)</td>
<td>110</td>
<td>86</td>
<td>154</td>
<td>204</td>
<td>233</td>
<td>221</td>
<td>419</td>
<td>48-7</td>
</tr>
</tbody>
</table>

Control yield = 603 Kg/ha.; No. of trials = 6.

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P1</th>
<th>N2P2</th>
<th>N1P4K4</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Cotton in Kg/ha.</td>
<td>63</td>
<td>65</td>
<td>19</td>
<td>46</td>
<td>55</td>
<td>99</td>
<td>212</td>
<td>255</td>
<td>68-9</td>
</tr>
</tbody>
</table>

Control yield = 469 Kg/ha.; No. of trials = 3.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P1</th>
<th>N2P2</th>
<th>N1P4K4</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Cotton in Kg/ha.</td>
<td>64</td>
<td>116</td>
<td>-20</td>
<td>40</td>
<td>82</td>
<td>124</td>
<td>225</td>
<td>304</td>
<td>55-6</td>
</tr>
</tbody>
</table>

Control yield = 673 Kg/ha.; No. of trials = 5.

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P1</th>
<th>N2P2</th>
<th>N1P4K4</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Cotton in Kg/ha.</td>
<td>65</td>
<td>220</td>
<td>-90</td>
<td>-150</td>
<td>30</td>
<td>20</td>
<td>240</td>
<td>400</td>
<td>120-9</td>
</tr>
</tbody>
</table>

Control yield = 560 Kg/ha.; No. of trials = 2.

Seivagatsnagar

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P1</th>
<th>N2P2</th>
<th>N1P4K4</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Cotton in Kg/ha.</td>
<td>63</td>
<td>275</td>
<td>46</td>
<td>125</td>
<td>322</td>
<td>407</td>
<td>604</td>
<td>608</td>
<td>56-2</td>
</tr>
</tbody>
</table>

Control yield = 1028 Kg/ha.; No. of trials = 9.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P1</th>
<th>N2P2</th>
<th>N1P4K4</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Cotton in Kg/ha.</td>
<td>64</td>
<td>172</td>
<td>8</td>
<td>62</td>
<td>220</td>
<td>300</td>
<td>451</td>
<td>519</td>
<td>32-3</td>
</tr>
</tbody>
</table>

Control yield = 643 Kg/ha.; No. of trials = 9.

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P1</th>
<th>N2P2</th>
<th>N1P4K4</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Cotton in Kg/ha.</td>
<td>65</td>
<td>178</td>
<td>-12</td>
<td>102</td>
<td>277</td>
<td>336</td>
<td>625</td>
<td>589</td>
<td>73-2</td>
</tr>
</tbody>
</table>

Control yield = 725 Kg/ha.; No. of trials = 7.

Banswara

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P1</th>
<th>N2P2</th>
<th>N1P4K4</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Cotton in Kg/ha.</td>
<td>65</td>
<td>180</td>
<td>45</td>
<td>85</td>
<td>215</td>
<td>275</td>
<td>405</td>
<td>360</td>
<td>45-4</td>
</tr>
</tbody>
</table>

Control yield = 85 Kg/ha.; No. of trials = 2.
Crop: Cotton. Ref: Rj. 62, 63(S.F.T.).
Site: (District) Banswara. Type: ‘M’.

Object: To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients (Type A1).

1. BASAL CONDITIONS:
   (i) N.A. (ii) Red and yellow. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   8 manurial treatments:
   - Control (no manure)
   - N1 = 33.6 Kg/ha. of N
   - P1 = 22.4 Kg/ha. of P2O5
   - P2 = 44.8 Kg/ha. of P2O5
   - N1P1 = 33.6 Kg/ha. of N + 22.4 Kg/ha. of P2O5
   - N1P2 = 33.6 Kg/ha. of N + 44.8 Kg/ha. of P2O5
   - N2P1 = 67.2 Kg/ha. of N + 44.8 Kg/ha. of P2O5
   - N2P2 = 67.2 Kg/ha. of N + 44.8 Kg/ha. of P2O5 + 44.8 Kg/ha. of K2O
   N applied as A/S; P2O5 as Super and K2O as Mur. Pot.

3. DESIGN:
   Same as in Type A1 (Irrigated) on page no. 293.

4. GENERAL:
   (i) to (iii) N.A. (iv) (a) 1962 to 1966 [1964 and 1965—N.A.]. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P1</th>
<th>N2P2</th>
<th>N2P2K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha. 105</td>
<td>58</td>
<td>444</td>
<td>132</td>
<td>164</td>
<td>149</td>
<td>157</td>
<td>205.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control yield=270 Kg/ha.; No. of trials=4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P1</th>
<th>N2P2</th>
<th>N2P2K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha. 128</td>
<td>91</td>
<td>61</td>
<td>190</td>
<td>219</td>
<td>237</td>
<td>232</td>
<td>284.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control yield=217 Kg/ha.; No. of trials=4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Cotton. Ref: Rj. 62, 63, 64, 65(S.F.T.) for Pali:
63, 64, 65(S.F.T.) for Sriganganagar and 65(S.F.T.) for Banswara.

Site: (District): Pali, Sriganganagar and Banswara. Type: ‘M’.

Object: To study the response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients. (Type: A3).

1. BASAL CONDITIONS:
   (i) N.A. (ii) Grey brown; Desert soil; Red and yellow. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.
2. TREATMENTS:

O = Control (no manure).

$N_1 = 56.0 \text{ Kg/ha. of } N$

$K_1 = 33.6 \text{ Kg/ha. of } K_2 O$

$K_2 = 67.2 \text{ Kg/ha. of } K_2 O$

$N_1K_1 = 56.0 \text{ Kg/ha. of } N + 33.6 \text{ Kg/ha. of } K_2 O$

$N_1K_2 = 112.0 \text{ Kg/ha. of } N + 67.2 \text{ Kg/ha. of } K_2 O$

$N_1P_1K_1 = 56.0 \text{ Kg/ha. of } N + 33.6 \text{ Kg/ha. of } P_2 O_5 + 33.6 \text{ Kg/ha. of } K_2 O$

N applied as A/S, $P_2 O_5$ as Super and $K_2 O$ as Mur. Pot.

3. DESIGN:

Same as in type A (Irrigated) on page 294.

4. GENERAL:

(i) to (iii) N.A. (iv) (a) 1962 to 1966 for Pali and Sriganganagar and 1963 only for Banswara. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

Pali

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$K_1$</th>
<th>$K_2$</th>
<th>$N_1K_1$</th>
<th>$N_1K_2$</th>
<th>$N_1P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha</td>
<td>184</td>
<td>81</td>
<td>153</td>
<td>110</td>
<td>174</td>
<td>332</td>
<td>339</td>
</tr>
</tbody>
</table>

Control yield = 482 Kg/ha.; No. of trials = 5.

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$K_1$</th>
<th>$K_2$</th>
<th>$N_1K_1$</th>
<th>$N_1K_2$</th>
<th>$N_1P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha</td>
<td>63</td>
<td>39</td>
<td>88</td>
<td>149</td>
<td>153</td>
<td>196</td>
<td>322</td>
</tr>
</tbody>
</table>

Control yield = 373 Kg/ha.; No. of trials = 3.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$K_1$</th>
<th>$K_2$</th>
<th>$N_1K_1$</th>
<th>$N_1K_2$</th>
<th>$N_1P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha</td>
<td>163</td>
<td>27</td>
<td>54</td>
<td>27</td>
<td>64</td>
<td>186</td>
<td>207</td>
</tr>
</tbody>
</table>

Control yield = 548 Kg/ha.; No. of trials = 4.

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$K_1$</th>
<th>$K_2$</th>
<th>$N_1K_1$</th>
<th>$N_1K_2$</th>
<th>$N_1P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha</td>
<td>305</td>
<td>15</td>
<td>5</td>
<td>255</td>
<td>248</td>
<td>445</td>
<td>245</td>
</tr>
</tbody>
</table>

Control yield = 430 Kg/ha.; No. of trials = 2.

Sriganganagar

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$K_1$</th>
<th>$K_2$</th>
<th>$N_1K_1$</th>
<th>$N_1K_2$</th>
<th>$N_1P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha</td>
<td>242</td>
<td>-18</td>
<td>34</td>
<td>291</td>
<td>319</td>
<td>578</td>
<td>518</td>
</tr>
</tbody>
</table>

Control yield = 780 Kg/ha.; No. of trials = 8.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$K_1$</th>
<th>$K_2$</th>
<th>$N_1K_1$</th>
<th>$N_1K_2$</th>
<th>$N_1P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha</td>
<td>151</td>
<td>-10</td>
<td>4</td>
<td>159</td>
<td>176</td>
<td>358</td>
<td>281</td>
</tr>
</tbody>
</table>

Control yield = 615 Kg/ha.; No. of trials = 6.
65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₁P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>247</td>
<td>-36</td>
<td>-16</td>
<td>404</td>
<td>281</td>
<td>512</td>
<td>321</td>
</tr>
</tbody>
</table>

Control yield = 600 Kg/ha.; No. of trials = 4.

Banswara

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₁P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>125</td>
<td>10</td>
<td>30</td>
<td>195</td>
<td>195</td>
<td>315</td>
<td>295</td>
</tr>
</tbody>
</table>

Control yield = 65 Kg/ha.; No. of trials = 2.

Crop: Cotton.

Ref: Rj. 62(S.F.T) for Pali and 63(S.F.T.) for Banswara.

Site: (District): Pali and Banswara.

Type: ‘M’.

Object: To study response curves of important cereal, cash and oil seed crops to Potash applied singly and in combination with other nutrients (Type: A₂).

1. BASEAL CONDITIONS:
   (i) N.A.  (ii) Grey brown; Red and yellow.  (iii) to (vi) N.A.  (vii) Unirrigated.  (viii) to (x) N.A.

2. TREATMENTS:

8 manural treatments:

O = Control (no manure).
N₁ = 33·6 Kg/ha. of N.
K₁ = 22·4 Kg/ha. of K₂O.
N₁K₁ = 33·6 Kg/ha. of N + 22·4 Kg/ha. of K₂O.
N₂ = 44·8 Kg/ha. of K₂O.
N₁K₂ = 33·6 Kg/ha. of N + 44·8 Kg/ha. of K₂O.
N₁K₃ = 67·2 Kg/ha. of N + 44·8 Kg/ha. of K₂O.
N₁P₁K₁ = 33·6 Kg/ha. of N + 22·4 Kg/ha. of P₂O₅ + 22·4 Kg/ha. of K₂O.

N applied as A/S, P₂O₅ as Super and K₂O as Mur. Pot.

3. DESIGN:

Same as in type A₁ (Irrigated) on page 293.

4. GENERAL:

(i) to (iii) N.A.  (iv) (a) 1962 only for Pali and 1963 to 1966 for Banswara [1964 and 1965 N.A.].  (b) and (c) N.A.  (v) to (vii) N.A.

5. RESULTS:

Pali 62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₁P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>91</td>
<td>-110</td>
<td>-112</td>
<td>67</td>
<td>92</td>
<td>-6</td>
<td>-4</td>
</tr>
</tbody>
</table>

Control yield = 416 Kg/ha.; No. of trials = 6.

Banswara

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₁P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of cotton in Kg/ha.</td>
<td>170</td>
<td>84</td>
<td>101</td>
<td>121</td>
<td>108</td>
<td>217</td>
<td>187</td>
</tr>
</tbody>
</table>

Control yield = 207 Kg/ha.; No. of trials = 4.
Crop = Cotton. Ref = Rj. 60(S.F.T.).
Type = 'M'.

Object: — To study the response of Cotton to levels of N, P and K applied individually and in combinations. (Type : A).

1. BASAL CONDITIONS:
   (i) N.A.  (ii) As per results  (iii) to (vi) N.A.  (vii) Irrigated.  (viii) to (x) N.A.

2. TREATMENTS:
   8 manurial treatments
   0 = Control (no manure).
   N = 44.8 Kg/ha. of N
   P = 22.4 Kg/ha. of P$_4$O$_5$
   K = 22.4 Kg/ha. of K$_2$O
   NP = 44.8 Kg/ha. of N + 22.4 Kg/ha. of P$_4$O$_5$
   NK = 44.8 Kg/ha. of N + 22.4 Kg/ha. of K$_2$O
   PK = 22.4 Kg/ha. of P$_4$O$_5$ + 22.4 Kg/ha. of K$_2$O
   NPK = 44.8 Kg/ha. of N + 22.4 Kg/ha. of P$_4$O$_5$ + 22.4 Kg/ha. of K$_2$O
   N applied as A/S, P$_4$O$_5$ as Super and K$_2$O as Mur. of Pot.

3. DESIGN:
   (i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on kharif cereal, 8 on a rabi cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/98.8 ha.  (b) 1/197.7 ha.  (iv) Yes.

4. GENERAL:
   N.A.

5. RESULTS:

   Av. response in Kg/ha.

<table>
<thead>
<tr>
<th>District</th>
<th>Soil Class</th>
<th>No. of trials</th>
<th>Control</th>
<th>N</th>
<th>P</th>
<th>K</th>
<th>S.E.</th>
<th>NP</th>
<th>NK</th>
<th>PK</th>
<th>NPK</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banswara Red &amp; black</td>
<td>7</td>
<td>390</td>
<td>60</td>
<td>20</td>
<td>30</td>
<td>12</td>
<td>0</td>
<td>-20</td>
<td>30</td>
<td>-20</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>Pali</td>
<td>4</td>
<td>1040</td>
<td>140</td>
<td>30</td>
<td>40</td>
<td>30</td>
<td>0</td>
<td>40</td>
<td>-20</td>
<td>20</td>
<td>50</td>
<td>12</td>
</tr>
<tr>
<td>Sriganganagar</td>
<td>4</td>
<td>580</td>
<td>180</td>
<td>110</td>
<td>20</td>
<td>75</td>
<td>0</td>
<td>230</td>
<td>-200</td>
<td>-10</td>
<td>90</td>
<td>38</td>
</tr>
</tbody>
</table>

   Crop = Cotton. Ref = Rj. 60(S.F.T.).
Site = (District) Banswara, Pali and Sriganganagar. Type = 'M'.

Object: — To investigate the relative efficiency of different nitrogenous fertilizers at different doses (Type : B).

1. BASAL CONDITIONS:
   (i) N.A.  (ii) Red and black for Banswara and Desert for others.  (iii) to (vi) N.A.  (vii) Irrigated.  (viii) to (x) N.A.

2. TREATMENTS:
   O = Control (no manure).
   n$_1$ = 44.8 Kg/ha. of N as A/S
   n$_2$ = 89.6 Kg/ha. of N as A/S
   n$_3$ = 44.8 Kg/ha. of N as Urea
   n$_4$ = 89.6 Kg/ha. of N as Urea
   n$_5$ = 44.8 Kg/ha. of N as C/A/N.
   n$_6$ = 89.6 Kg/ha. of N as C/A/N.
DESIGN:
Same as in type A1 on page no. 300.

GENERAL:
N.A.

RESULTS:
Av. yield of Cotton in Kg/ha.

<table>
<thead>
<tr>
<th>District</th>
<th>No. of trials</th>
<th>O</th>
<th>n1</th>
<th>n2</th>
<th>n1'</th>
<th>n2'</th>
<th>n1''</th>
<th>n2''</th>
<th>G.M.</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banswara</td>
<td>6</td>
<td>460</td>
<td>490</td>
<td>590</td>
<td>480</td>
<td>570</td>
<td>450</td>
<td>540</td>
<td>511</td>
<td>21.2</td>
</tr>
<tr>
<td>Pali</td>
<td>3</td>
<td>760</td>
<td>830</td>
<td>1020</td>
<td>840</td>
<td>830</td>
<td>880</td>
<td>930</td>
<td>870</td>
<td>33.2</td>
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<tr>
<td>Sriganganagar</td>
<td>4</td>
<td>1000</td>
<td>1070</td>
<td>1420</td>
<td>1100</td>
<td>1410</td>
<td>1010</td>
<td>1240</td>
<td>1179</td>
<td>113.1</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Site :- Govt. Agri. Farm, Ummedganj.
Ref :- Rj. 63(26), 64(18).
Type :- ‘MV’.

Object :- To find out a suitable dose of application of fertilizers for different varieties of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. for 63 (26); Wheat for 64 (18). (c) N.A. for 63 (26); 44.8 Kg/ha. of P_2O_5 for 64 (18).
(ii) N.A. (iii) 7.6.63; 1.6.64. (iv) (a) N.A. for 63 (26); 1 ploughing, 2 plankings, 1 discing and 1 barrowing for 64 (18). (b) Dibbling for 63 (26); Drilling for 64 (18). (c) 18 to 20 Kg/ha. (d) 76 cm. between rows. (e) 3 for 63 (26); N.A. for other. (v) N.A. for 63 (26); Nil for 64 (18). (vi) As per treatments. (vii) Irrigated. (viii) 3 hoeings for 63 (26); 1 weeding and 3 hoeing for 64 (18). (ix) N.A. for 63 (26); 72 cm. for others. (x) 10.11.63, 31.12.63, 2.2.64; 10.12.64.

2. TREATMENTS:
Main-plot treatments:
6 varieties:
V_1 = M 49—435, V_2 = M—48—446, V_3 = M 51—902, V_4 = C Indore—J, V_5 = R—5 and V_6 = Biddhawar—I.

Sub-plot treatments:
3 levels of fertilizers:
F_1 = 33·6 Kg/ha. of N as A/S+22·4 Kg/ha. of P_2O_5 as Super+22·4 Kg/ha. of K_2O as Mur. Pot., F_2 = 2 F_1 and F_3 = 3 F_1.
N was applied in two equal doses. P_2O_5 and K_2O were applied at sowing.

3. DESIGN:
(i) Split-plot. (ii) 6 main-plots/replication; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 4·6 m. x 4·6 m. (b) 3·8 m. x 3·8 m. (v) 38 cm. x 38 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) N.A. for 63 (26); Nil for 64 (18). (iii) Yield of Kapas. (iv) (a) 1963 to 1964. (b) No. (c) Results of combined analysis are given under 5. (v) N.A. (vi) No. (vii) Both the error variances are homogeneous Main-plot Treatments x years interaction is absent while sub-plot Treatments x years interaction is absent.

5. RESULTS:
(i) 1164 Kg/ha. (ii) (a) 489·2 Kg/ha. (based on 35 d, f. made up of Treatments x years interaction and pooled error). (b) 540·2 Kg/ha. (based on 12 d, f. made up of various components of interaction of Treatments x years). (iii) Main effect of V is highly significant and that of F is significant. (iv) Av. yield of Kapas in Kg/ha.
Crop - Cotton (Kharif).

Site :- Govt. Agri. Res. Farm, Borkhera.

Ref :- Rj. 63(25), 64(17).

Type :- 'CV'.

Object :- To find out a suitable date of sowing for different varieties of Cotton.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) N.A. for 63 (25); Sugarcane for 64 (17). (c) N.A. (ii) Clay loam. (iii) As per treatments.
   (iv) (a) N.A. for 63 (25); 2 ploughings and 1 harrowing for 64 (17). (b) Dibbling for 63 (25); Drilling for 64 (17).
   (c) 15 to 18 Kg/ha. (d) 61 em. between rows for 63 (25) and 46 em. between rows for other.
   (e) 3 for 63 (25); N.A. for 64 (17). (v) 33·6 Kg/ha. of N as A/S+44·8 Kg/ha. of P<sub>2</sub>O<sub>5</sub> as Super+44·8 Kg/ha.
   of K<sub>2</sub>O as Pot. (vi) As per treatments. (vii) Irrigated. (viii) 2 hoeings. (ix) N.A. for 63 (25); 72 cm. for 64 (17).
   (x) 4 pickings from 4.10.63 to 18.1.64; 15.9.64.

2. TREATMENTS :
   Main-plot treatments
   5 dates of sowing:  D<sub>1</sub>=20th April.  D<sub>2</sub>=5th May,  D<sub>3</sub>=20th May,  D<sub>4</sub>=4th June and  D<sub>5</sub>=19th June.
   Sub-plot treatments
   3 varieties:  V<sub>1</sub>=C-Indore 1,  V<sub>2</sub>=M 51-902 and  V<sub>3</sub>=M 49-435.

3. DESIGN :
   (i) Split-plot. (ii) (a) 5 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 6·1 m. x 4·6 m.
   (b) 5·3 m. x 3·8 m. (v) 38 cm. x 38 cm. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Pink ball worm infected the crop, dusting of B.H.C. for 63 (25); Nil for 64 (17).
   (iii) Yield of Kupas. (iv) (a) 1963 to 1964. (b) No. (c) Results of combined analysis are given under 5. (v)
   and (vi) Nil. (vii) Both the error variances are homogenous. Main-plot Treatments x years interaction is
   present while sub-plots Treatments x years interaction is absent.

5. RESULTS :
   (i) 1054 Kg/ha. (ii) (a) 1145·6 Kg/ha. (based on 4 d. f. made up of Treatments x years interaction. (b) 310·6 Kg/ha.
   (based on 70 d. f. made up of interaction of various components of Treatments with years and
   pooled error.) (iii) Main effect of V alone is highly significant. (iv) Av. yield of Kupas in Kg/ha.

<table>
<thead>
<tr>
<th>D&lt;sub&gt;1&lt;/sub&gt;</th>
<th>D&lt;sub&gt;2&lt;/sub&gt;</th>
<th>D&lt;sub&gt;3&lt;/sub&gt;</th>
<th>D&lt;sub&gt;4&lt;/sub&gt;</th>
<th>D&lt;sub&gt;5&lt;/sub&gt;</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V&lt;sub&gt;1&lt;/sub&gt;</td>
<td>1524</td>
<td>942</td>
<td>898</td>
<td>904</td>
<td>570</td>
</tr>
<tr>
<td>V&lt;sub&gt;2&lt;/sub&gt;</td>
<td>1600</td>
<td>869</td>
<td>870</td>
<td>1027</td>
<td>609</td>
</tr>
<tr>
<td>V&lt;sub&gt;3&lt;/sub&gt;</td>
<td>2115</td>
<td>1344</td>
<td>905</td>
<td>950</td>
<td>628</td>
</tr>
</tbody>
</table>

Mean 1766 1052 891 960 602 1054

C.D. for V marginal means = 138·6 Kg/ha.

C.D. for V marginal means = 286·6 Kg/ha.

C.D. for F marginal means = 240·3 Kg/ha.
Crop :- Tobacco (Kharif).

Site :- Changperi.

Ref :- Rj. 63(67).

Type :- ‘D’.

Object — To study the control of orobanche by preemergence sprays of orag Herbicide No. 1.

1. BASAL CONDITIONS :

(i) (a) Maize-Tobacco. (b) Maize. (c) N.A. (ii) and (iii) N.A. (iv) K. 49. (v) (a) N.A. (b) Transplanting. (c) N.A. (d) 61 cm. x 61 cm. (e) N.A. (vi) 30.8.1963. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 13.1.1964.

2. TREATMENTS:

9 sprayings of herbicides : T₀=Control (no spray), T₁=One spray at 6·7 Kg/ha. after 4 weeks of transplanting ; T₂=One spray at 6·7 Kg/ha. after 6 weeks of transplanting, T₃=Two sprays at 3·4 Kg/ha. after 2 and 4 weeks of transplanting, T₄=Two sprays at 3·4 Kg/ha. after 2 and 6 weeks of transplanting, T₅=Two sprays at 3·4 Kg/ha. after 4 and 6 weeks of transplanting, T₆=Two sprays at 3·4 Kg/ha. after 4 and 8 weeks of transplanting, T₇=Three sprays at 2·2 Kg/ha. after 2, 4 and 6 weeks of transplanting and T₈=Three sprays at 2·2 Kg/ha. after 4, 6 and 8 weeks of transplanting.

3. DESIGN :

(i) R.B.D.; 9 plots/block and 4 replications. (ii) N.A. (iii) (a) 4·6 m. x 3·1 m. (b) 3·1 m. x 1·5 m. (iv) Yes.

4. GENERAL :

(i) and (ii) N.A. (iii) Number of orobanche plants per tobacco plant. (iv) (a) 1963 only. (b) No. (c) Nil. (v) Nil. (vi) N.A. (vii) Nil.

5. RESULTS :

(i) 13. (ii) 1·5. (iii) Treatment differences are not significant. (iv) Av. no. of orobanche plants/tobacco plant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. number</td>
<td>23</td>
<td>11</td>
<td>21</td>
<td>11</td>
<td>5</td>
<td>21</td>
<td>14</td>
<td>8</td>
</tr>
</tbody>
</table>

Crop :- Groundnut (Kharif).

Site :- Govt. Agri. Res. Farm, Sriganganagar.

Ref :- Rj. 64(27).

Type :- ‘M’.

Object — To study the effect of fertilizers on the yield of Groundnut.

1. BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 27.6.64. (iv) (a) 4 ploughings. (b) Behind the plough. (c) 74 Kg/ha. (d) Rows 30 cm. apart. (e) N.A. (v) Nil. (vi) P 6–1. (vii) Unirrigated. (viii) 2 hand hoeings. (ix) N.A. (x) 27.1 to 4.2.65.

2. TREATMENTS :

All combinations of (1), (2) and (3)

(1) 3 levels of N as : A/S N₀=0, N₁=37 and N₂=74 Kg/ha.
(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=37 and P₂=74 Kg/ha.
(3) 2 levels of K₂O as Mur. Pot. : K₀=0 and K₁=25 Kg/ha.

3. DESIGN:

(i) Fact. in R.B.D. (ii) (a) 18. (b) N.A. (iii) 4. (iv) (a) 5·5 m. x 3·7 m. (b) 4·9 m. x 3·1 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL :

(i) Good. (ii) Nil. (iii) Yield of pod. (iv) (a) 1964 only. (b) No. (c) N.A. (v) to (vii) Nil.
5. RESULTS:

(i) 2679 Kg/ha.  (ii) 530 Kg/ha.  (iii) Main effect of N alone is highly significant.  (iv) Av. yield of pod in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>K₀</td>
<td>2231</td>
<td>2760</td>
<td>2746</td>
<td>2501</td>
<td>2531</td>
<td>2705</td>
<td>2579</td>
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<tr>
<td>K₁</td>
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<tr>
<td>Mean</td>
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<td>2837</td>
<td>2938</td>
<td>2556</td>
<td>2679</td>
<td>2803</td>
<td>2679</td>
</tr>
</tbody>
</table>

C.D. for N marginal means=307.6 Kg/ha.

Crop :- Groundnut (Kharif).
Object :-To determine suitable date of sowing and optimum number of irrigations in relation to different fertility levels.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A.  (ii) Sandy loam.  (iii) As per treatments.  (iv) (a) (b) N.A. (c) 62 Kg/ha.  (d) 46 cm. x 30 cm.  (e) N.A.  (v) 22.4 Kg/ha. of N.  (vi) R.S. 1.  (vii) Irrigated.  (viii) N.A.  (ix) 72 cm.  (x) 27.12.64.

2. TREATMENTS:

Main-plot treatments :
All combinations of (1) and (2)
(1) 3 dates of sowing : D₁=3.6.64, D₂=24.6.64 and D₃=15.7.64.
(2) 4 irrigational treatments : I₁=Pre sowing irrigation only, I₂=I₁+irrigation after 30 days. I₃=I₁+irrigation at the time of flowering and I₄=I₁+irrigation after 30 days+irrigation at the time of flowering.

Sub-plot treatments :
3 levels of P₂O₅ : P₀=0, P₁=37.1 and P₂=74.2 Kg/ha.

3. DESIGN:

(i) Split-plot.  (ii) (a) 12 main-plots/replication ; 3 sub-plots/main-plot.  (b) N.A.  (iii) 3.  (iv) (a) N.A.  (b) 5:5 m. x 4:6 m.  (v) N.A.  (vi) Yes.

4. GENERAL:

(i) Good.  (ii) N.A.  (iii) Yield of pod.  (iv) (a) 1964 only.  (b) No.  (c) Nil.  (v) to (vii) Nil.

5. RESULTS:

(i) 1499 Kg/ha.  (ii) (a) 524.0 Kg/ha.  (b) 230.5 Kg/ha.  (iii) Main effects of I, D and P are highly significant and interaction D x P is significant.  (iv) Av. yield of pod in Kg/ha.
### Crop: Groundnut (Kharif).

### Site: Govt. Agri. Res. Farm, Sriganganagar.

### Object: To study the effect of P$_2$O$_5$ to different stages of crop with the determination of suitable method of application.

#### 1. BASAL CONDITIONS:
1. (a) No. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 15.7.65. (iv) (a) 5 ploughings. (b) Behind the plough. (c) 33.6 Kg/ha. (d) 30 cm × 15 cm. (e) N.A. (v) N.A. (vi) AK-12-24. (vii) Irrigated. (viii) 2 hand hoeings. (ix) N.A. (x) 11.12.65.

#### 2. TREATMENTS:
5 times and methods of application of P$_2$O$_5$: T$_1$ = Full P$_2$O$_5$ as drill at sowing, T$_2$ = Full P$_2$O$_5$ as drill after one month of sowing, T$_3$ = $rac{1}{2}$ P$_2$O$_5$ as drill at sowing + $rac{1}{2}$ P$_2$O$_5$ as drill after one month of sowing, T$_4$ = $rac{1}{2}$ P$_2$O$_5$ as drill at sowing + $rac{1}{2}$ as foliar after a month of sowing and T$_5$ = Follior alone (full P$_2$O$_5$).

Dose of P$_2$O$_5$ applied not available.

#### 3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) 5.5 m × 3.7 m. (b) 4.9 m × 3.1 m. (v) 30 cm × 30 cm. (vi) Yes.

#### 4. GENERAL:
(iv) Normal. (ii) Incidence of grab weevil. BHC 16.8 Kg/ha., Endrin @ 0.02%, foliar two ties @ 2.5 oz/45 gallons of water. (iii) Yield of pod. (iv) (a) 1965-only. (b) N.O. (c) Nil. (v) to (vii) Nil.

#### 5. RESULTS:
(i) 997 Kg/ha. (ii) 350.3 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pod in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>I$_1$</th>
<th>I$_2$</th>
<th>I$_3$</th>
<th>I$_4$</th>
<th>Mean</th>
<th>P$_2$</th>
<th>P$_3$</th>
<th>P$_4$</th>
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<tbody>
<tr>
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<td>2139</td>
<td>2219</td>
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<td>1812</td>
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<td>1725</td>
<td>2145</td>
<td>2288</td>
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<td>1805</td>
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<td>2012</td>
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<td>732</td>
<td>488</td>
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<td>474</td>
<td>614</td>
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<tr>
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C.D. for D marginal means = 256.1 Kg/ha.
C.D. for I marginal means = 295.8 Kg/ha.
C.D. for P marginal means = 109.5 Kg/ha.
C.D. for D means at the same level of D = 189.7 Kg/ha.
C.D. for D means at the same level of P = 299.2 Kg/ha.

Ref. :- Rj. 65(16).

Type :- ‘M’.
Crop: Guinea Peanut (Kharif).
Ref: Rf. 61(90), 63(33).

Site: Govt. Agri. Res. Farm, Borkhera.
Type: ‘C’.

Object: To find out the effect of sowing methods, row spacing and seed rate on the yield of Guinea Peanut.

1. BASAL CONDITIONS:
(i) (a) Castor-Fallow-Groundnut for 61(90); Nil for 63(23). (b) Fallow fallow for 61(90); Wheat for other.
(c) Nil. (ii) Clay loam. (iii) 28.7.1961 ; 17.7.1963. (iv) (a) One ploughing, one backhering and 2 discs for 61(90); 2 backherings, 2 discs and pata for 63(23). (b) to (d) As per treatments. (e) N.A. (v) 33.6 Kg/ha. of N+67.2 Kg/ha. of P\textsubscript{10}6 +33.6 Kg/ha. of K\textsubscript{10}6 for 61(90); N.A. for 63(23). (vi) R.S.B. 87. (vii) Unirrigated. (viii) One earthing for 61(90); one weeding and one earthing for other. (ix) N.A.
(x) 18.11.1961 ; 1 to 3.11.1963.

2. TREATMENTS:
Main-plot treatments:
2 methods of sowing : M\textsubscript{1} = Ridge sowing and M\textsubscript{2} = Flat sowing.
Sub-plot treatments:
2 spacings between rows : S\textsubscript{1} = 30 and S\textsubscript{2} = 46 cm.
Sub-sub-plot treatments:
3 seed rates: R\textsubscript{1} = 44.8, R\textsubscript{2} = 89.7 and R\textsubscript{3} = 134.5 Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) 2 main-plots/replication ; 2 sub-plots/main-plot ; 3 sub-sub-plots/sub-plot. (b) N.A.
(iii) 4. (iv) (a) 6'1 m. x 4'6 m. (b) 5'5 m. x 4'0 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of pod. (iv) (a) 1961 to 1963 (1962 N.A.). (b) N.A. (c) Results of combined analysis are given under 5. (x) and (vi) Nil. (vii) All the three error variances are homogeneous and interactions of main-plot treatments with year is present while those of sub-plot and sub-sub-plot treatments with years are absent.

5. RESULTS:
(i) 2345 Kg/ha. (ii) (a) 216.8 Kg/ha. [based on 1 d.f. made up of Treatments x years interaction] (b) 522.2 Kg/ha. [based on 14 d.f. made up of various components of Treatments x years interaction and pooled error]. (c) 460.8 Kg/ha. [based on 54 d.f. made up of various components of Treatments x years interaction and pooled error]. (iii) Main effect of R alone is highly significant. (iv) Av. yield of pod in Kg/ha,

<table>
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<th>S\textsubscript{2}</th>
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C.D. for R marginal means=21.2 Kg/ha.

Crop: Guinea Peanut (Kharif).
Ref: Rj. 63(33).

Type: ‘C’.

Object: To find out the suitable method and no. of earthings and spacings for Guinea Peanut.
1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) 44.8 Kg/ha. of N and P₂O₅ each. (ii) N.A. (iii) 2.7.63. (iv) (a) 4 ploughings. (b) N.A. (c) 67 Kg/ha. (d) As per treatments. (e) N.A. (v) 16.8 Kg/ha. of N by broadcasting and 44.8 Kg/ha. of P₂O₅ by drilling at the time of sowing. (vi) R.S.—I. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 5.1.64.

2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2) with a control.
(1) No. of earthings: E₁ =1 and E₂ =2 earthings.
(2) 2 methods of earthings: M₁ = By manual labour and M₂ = By desi plough.

Sub-plot treatments:
3 spacings between rows: S₁ =30, S₂ =46 and S₃ =61 cm.

3. DESIGN:

(i) Split-plot. (ii) (a) 5 main-plots/replication, 3 sub-plots/main plot. (b) N.A. (iii) 4. (iv) (a) and (b) 4·6 m. x 3·7 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Yield of pod. (iv) (a) 1963 only. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS:

(i) 1500 Kg/ha. (ii) (a) 286.0 Kg/ha. (b) 341.0 Kg/ha. (iii) Main effect of E is highly significant. Main effect of M and S and interaction E x M is significant. (iv) Av. yield of pod in Kg/ha.

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C.D. for E or M marginal means =180·0 Kg/ha.
C.D. for S marginal means =246·2 Kg/ha.
C.D. for means in the body of E x M table =254·6 Kg/ha.

Crop :- Groundnut (Kharif).
Site :- Govt. Agri. Farm, Borkhera.

Object :-To study the effect of N, P, K, S on yield of Groundnut.

Ref :- Rj. 60(77).
Type :- ‘CM’.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Fallow. (c) 6 C.L. of F.Y.M. (ii) N.A. (iii) 9.7.60. (iv) (a) 2 ploughings. (b) N.A. (c) 67·2 Kg/ha. of shelled Groundnut. (d) As per treatments. (e) N.A. (v) N.A. (vi) Spreading local. (vii) Unirrigated. (viii) 1 weeding and two earthings. (ix) and (x) N.A.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2)
(1) 2 spacings between rows: \( S_1 = 30 \) and \( S_2 = 46 \) cm.
(2) 2 spacings between plants: \( R_1 = 7.6 \) and \( R_2 = 15.2 \) cm.

Sub-plot treatments:
All combinations of (1), (2) and (3)
(1) 3 levels of N as A/S:
\( N_0 = 0, N_1 = 22.4 \) and \( N_2 = 44.8 \) Kg/ha.
(2) 3 levels of \( P_2 \)O\(_2\) as Super:
\( P_0 = 0, P_1 = 33.6 \) and \( P_2 = 67.2 \) Kg/ha.
(3) 3 levels of K\(_2\)O as Mur. of Pot.:
\( K_0 = 0, K_1 = 16.8 \) and \( K_2 = 33.6 \) Kg/ha.

3. DESIGN:
(i) Split-plot confd. (ii) (a) 9 sub-plots/block; 3 blocks/main-plot. 4 main-plots/replication. (b) N.A.
(iii) 1. (iv) (a) 6.1 m. x 4.6 m. (b) 5.5 m. x 3.7 m. (v) 30 cm. x 45 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) No. (iii) Yield of pod. (iv) (a) 1960 only. (b) N.A. (c) Nil. (c) to (vii) Nil.

5. RESULTS:
(i) 2213 Kg/ha. (ii) (a) 837.2 Kg/ha. (b) 483.4 Kg/ha. (iii) Main effect of P alone is highly significant. (iv) Avg. yield of pod in Kg/ha.

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Crop :- Groundnut.
Site :- Govt. Agri. Res. Farm, Sriganganagar.
Object :- Determination of optimum number and stages of irrigation, optimum dose of phosphorus together with suitable period of sowing for the crop.

1. BASAL CONDITIONS:
(i) (a) No. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) As per treatments. (iv) (a) 5 ploughings. (b) Behind the plough. (c) 74 Kg/ha. (d) 30 cm. x 15 cm. (e) -. (v) N.A. (vi) A.K.-12-24. (vii) Irrigated. (viii) 6 hand hoeings. (ix) N.A. (x) 9 to 15.12.65.
2. TREATMENTS:

Main-plot treatments:
All combinations of (1) and (2)
(1) 3 dates of sowing: $D_1=1.6.65$, $D_2=2.6.65$ and $D_3=19.7.65$.
(2) 4 irrigational treatments: $I_0=$Control (No irrigation), $I_1=$One irrigation after 30 days of sowing, $I_2=$One irrigation after 70 days of sowing and $I_3=$One irrigation after 30 days and second after 70 days of sowing.

Sub-plot treatments:
3 levels of $P_0$: $P_0=0$, $P_1=37.1$ and $P_2=74.2$ Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 12 main-plots/replication, 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 5.5 m x 4.0 m. (b) 4.9 m x 4.0 m. (v) 30 cm x 30 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Incidence of gap weerial. BHC @ 37 Kg/ha, endrin 0.02%, folidol @ 2.5 oz/45 gallons (iii) Yield of pod. (iv) (a) 1965—contd. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1000 Kg/ha. (ii) (a) 574.2 Kg/ha. (b) 232.2 Kg/ha. (iii) Main effects of D and I are highly significant.
(iv) Av. yield of groundnut in Kg/ha.

<table>
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C.D. for D marginal means =280.6 Kg/ha.
C.D for I marginal means =314.5 Kg/ha.

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Crop :- Groundnut (Kharif).
Site :- Govt. Agri. Res. Farm, Borkhera.

Object :- To find out the effect of Sulphur with different nitrogenous fertilizers on the yield of Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) 22.4 Kg/ha. of N. (ii) Clay loam. (iii) 4.7.64. (iv) (a) 1 ploughing, 1 bakhering, 1 harrowing and planking. (b) Drilling. (c) 98.8 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) 1 hoeing, 2 earthing and weeding. (ix) 72 cm. (x) 20, 21.10.64.

2. TREATMENTS:

Main-plot treatments:
7 sources of N at 22.4 Kg/ha. : $S_0=$Control, $S_1=A/S$, $S_2=C/A/N$, $S_3=Urea$, $S_4=A/S/N$, $S_5=Oil$ cake and $S_6=Compost$.

Sub-plot treatments:
4 doses of Sulphur: $D_0=0$, $D_1=11.2$, $D_2=22.4$ and $D_3=33.6$ Kg/ha.
3. DESIGN:
(i) Split-plot. (ii) (a) 7 main-plots/replication, 4 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 5.5 m. × 4.6 m, (b) 5.0 m. × 4.1 m. (v) 23 cm. × 23 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of pod. (iv) (a) 1964 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1046 Kg/ha. (ii) (a) 487 Kg/ha. (b) 218 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pod in Kg/ha.

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Crop :- Groundnut (Kharif).

Site :- Janta College Farm, Dabok.

Object :- To study the effect of N, P and K with and without Sulphur and Molybdenum on oil content and yield of Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Loam. (iii) N.A.; 20.7.1965. (iv) (a) 3 ploughings and 2 harrowings. (b) N.A. (c) 49'4 Kg/ha. (d) 46 cm. × 30 cm. (e) N.A. (v) 22.4 Kg/ha. of N as AJS+22.4 Kg/ha. of K₂O as Mur. Pot. (vi) Local for 63(8); AK 12-24 for 65(41). (vii) Unirrigated. (viii) N.A. for 63(8); 1 hoeing for other. (ix) N.A. (x) N.A.; 28, 29.10.1965.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of Molybdenum : M₀=0, M₁=1:1 and M₂=2:2 Kg/ha.
(2) 3 levels of P₂O₅ as Super : P₀=0, P₁=33:6 and P₂=67:2 Kg/ha.
(3) 3 levels of Sulphur : S₀=0, S₁=4:5 and S₂=9:0 Kg/ha.

3. DESIGN:
(i) 3 confd. (ii) (a) 9 plots/block, 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) 9'2 m. × 5'5 m. (b) 7'4 m. × 3'7 m. (v) 91 cm. × 91 cm. (vi) Yes.

4. GENERAL:
(i) N.A. for 63(8); Good for other. (ii) N.A. for 63(8); Nil for other. (iii) Yield of pod. (iv) (a) 1963 to 1965 [1964 N.A.]. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since the error variances are heterogeneous and the Treatments × years interaction is absent, results of individual years are presented under 5. Results.

5. RESULTS:

63(8)
(i) 984 Kg/ha. (ii) 116:0 Kg/ha. (iii) Main effects of M and interaction M × S × P are highly significant. Interaction M × S and M × P are significant. (iv) Av. yield of pod in Kg/ha.
Crop: Groundnut (Kharif).
Site: Govt. Agri. Farm, Sawai Madhopur.

Object: To study the effect of phosphatic fertilizers on yield and quality of Groundnut in combination with N and Potash.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) 2.7.1961; 1.8.1962. (iv) (a) 5 ploughings for 61(41); N.A. for other. (b) N.A. (c) 56 Kg/ha. (d) 46 cm. x 30 cm. (e) N.A. (v) N.A. (vi) Gangapur. (vii) Unirrigated for 61(41); N.A. for other. (viii) 2 weedings. (ix) N.A. (x) 28.12.1961; 8 to 10.11.1962.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 2 levels of N as A/S: N₁ = 0 and N₂ = 22.4 Kg/ha.
(2) 4 levels of P₂O₅ as Super: P₀ = 0; P₁ = 22.4, P₂ = 44.8 and P₃ = 67.2 Kg/ha.
(3) 2 levels of K₂O as Mur. Pot.: K₀ = 0 and K₁ = 22.4 Kg/ha.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 9.2 m. x 5.5 m. (b) 7.4 m. x 3.7 m. (v) 91 cm. x 91 cm. (vi) Yes.
4. GENERAL:
(i) Medium growth for 61(41); Good for other. (ii) Nil. (iii) Yield of pod. (iv) (a) 1961 to 1962. (b) N.A. (c) Results of combined analysis are given under 5. Results. (v) and (vi) N.A. (vii) Error variances are homogeneous and Treatments x years interaction is absent.

5. RESULTS:
(i) 1268 Kg/ha. (ii) 385.2 Kg/ha. (based on 72 d.f. made up interaction of various components of Treatments with years and pooled error). (iii) Interaction K x P is significant. (iv) Av. yield of pod in Kg/ha. 

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C.D. for means in the body of K x P table = 313.9 Kg/ha.

Crop :- Groundnut (Kharif).
Site :- Govt. Agri. Farm, Banswara.
Ref :- Rj. 64(12).
Type :- 'D'.

Object :- To determine the relative efficacy of different seed dressing fungicides in relation to yield, disease intensity and germination of Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy. (iii) 20.7.64. (iv) (a) 2 ploughings. (b) Dibbling. (c) 32 seeds/plot. (d) 30 cm. x 23 cm. (e) 1. (v) 56.0 Kg/ha. of N by broadcast+112.1 Kg/ha. of P2O5 by drilling. (vi) R.S = 1. (vii) Unirrigated. (viii) 1 hand weeding. (ix) N.A. (x) 12.11.64.

2. TREATMENTS:
Main-plot treatments : 3 fungus treatments of seeds: F1 = Aspergilus, F2 = Rhizopus and F3 = Mixture of both.
Sub-plot treatments : 16 seed treatments : T0 = Control, T1 = 3 gm. of Agrosan G.N., T2 = 2 gm. of Ceresan, T3 = 2 gm. of Phyon x L, T4 = 2 gm. of shell seed dresser, T5 = 2 gm. of Merculence DA, T6 = 3 gm. of Thoram, T7 = 2 gm. of Captan, T8 = 2 gm. of Beej powder no. 4, T9 = 2 gm. of Beej Powder no. 5, T10 = 2 gm. of Beej Powder no. 6, T11 = 2.5 gm. of Beej Powder no. 7, T12 = 2.5 gm. of Beej Powder no. 8, T13 = 2.5 gm. of Beej Powder no. 9, T14 = 2 gm. of Tritisan and T15 = Seed treated with fungus only.
Above chemicals were used for 1 Kg. of seed.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 16 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 1.8 m. x 1.2 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) As per treatments. (iii) No. of plants germinated. (iv) (a) 1964 only. (b) No. (c) N.A. (v) and (vi) N.A. (vii) 89.7 Kg/ha. of Aldrin 2% dust mixed with the soil before harvesting.

4. RESULTS:
(i) 64.2 degrees. (ii) (a) 10.2 degrees. (b) 7.5 degrees. (iii) None of the effects is significant. (iv) Av. % of germination in degrees.
Object — To determine the relative efficacy of different fungicides in relation to yield and disease intensity and germination of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Seson. (c) N.A. (ii) N.A. (iii) 21.7.65. (iv) (a) Ploughing and cross ploughing three times. (b) Dibbling. (c) N.A. (d) 30 cm. × 30 cm. (e) 1. (f) 12 Kg/ha. of N+20 Kg/ha. of \( \text{P}_2\text{O}_5 \). (g) 89.7 Kg/ha. of Eldrein dust. (vi) R.S. -1. (vii) Irrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   \( M_1 = \text{Aspergillus}, M_2 = \text{Rhizopus} \) and \( M_3 = \text{Mixture of } M_1 \) and \( M_2 \).

   Sub-plot treatments:
   \( S_1 = \text{Beej powder no. 5}, S_2 = \text{B.P. no. 6}, S_3 = \text{B.P. no. 8}, S_4 = \text{B.P. no. 9}, S_5 = \text{Ceresan}, S_6 = \text{Merculine}, S_7 = \text{Agrosan G.N.}, S_8 = \text{Miram}, S_9 = \text{Fungus and } S_{10} = \text{Control} \).

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication, 10 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 2.7 m. x 1.8 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Yield of pod. (iv) (a) 1965 only. (b) N.A. (c) Nil. (v) Durgapura. (vi) and (vii) Nil.

5. RESULTS:
   (i) 4059 Kg/ha. (ii) (a) 1851 Kg/ha. (b) 1110 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of groundnut in Kg/ha.

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Crop: Groundnut (Kharif).
Site: Govt. Agri. Farm, Bharatpur.
Ref: Rj. 64(9).
Type: 'D'.

Object: To determine the relative efficacy of seed dressing fungicides in relation to yield and germination of Groundnut.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) N.A. (iii) 20.7.64. (iv) (a) 2 ploughings. (b) Dibbling. (c) 32 seeds/plot. (d) 30 cm. x 23 cm. (e) One. (v) Nil. (vi) R.S.—1. (vii) Unirrigated. (viii) One weeding. (ix) N.A. (x) 11.11.64.

2. TREATMENTS:

Main-plot treatments:
- 3 fungus treatments of seed: F1 = Aspergillus, F2 = Rhizopus sp. and F3 = Mixture of both.

Sub-plot treatments:
- 16 seed treatments:
  - T1 = Control,
  - T2 = 3 gm. of Agrosan G.N.,
  - T3 = 2 gm. of Ceresan,
  - T4 = 2 gm. of Phygon x, T5 = 2 gm. of shell seed dresser,
  - T6 = 2 gm. of Merculine D.A.,
  - T7 = 2 gm. of Captan,
  - T8 = 2 gm. of Beej powder no 4,
  - T9 = 2 gm. of Beej Powder no 5,
  - T10 = 2 gm. of Beej Powder no. 6,
  - T11 = 2 gm. of Beej Powder no. 7,
  - T12 = 2·5 gm. of Beej Powder no. 8,
  - T13 = 2·5 gm. of Beej Powder no. 9,
  - T14 = 2·5 gm. of Beej Powder no. 10,
  - T15 = Fungi only.

Above fungicides were used for 1 Kg. of seed.

3. DESIGN:

(i) Split-plot with Lattice arrangements. (ii) (a) 16 plots/block, 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) and (b) 1·8 m. x 1·2 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) No. of plants germinated/plot, and Groundnut yield. (iv) (a) 1964 only. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) 89·7 Kg/ha. of Aldrin 2% dust broadcasted and mixed with soil in the field before sowing.

5. RESULTS:

Groundnut yield:
- (i) 1347 Kg/ha. (ii) (a) 1233·0 Kg/ha. (b) 571·0 Kg/ha. (iii) Interaction F x T alone is significant. (iv) Av. yield of pod in Kg/ha.

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C.D. for T means at the same level of F = 927·7 Kg/ha.
C.D. for F means at the same level of T = 1124·6 Kg/ha.

Germination:
- (i) 64·1 degrees (ii) (a) 10·3 degrees (b) 7·2 degrees (iii) None of the effects is significant. (iv) Av. yield of seeds germinated (in degrees).
Crop: Groundnut (Kharif).
Site: Govt. Agri. Farm, Durgapura.

Object: To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Groundnut.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Sandy loam. (iii) N.A. (iv) (a) and (b) N.A. (c) 48 seeds/plot. (d) 46 cm x 23 cm. (e) N.A. (v) N.A. (vi) R.S. 1. (vii) to (x) N.A.

2. TREATMENTS:
Main-plot treatments:
3 fungus treatments of seed: F₁ = Aspergillus niger, F₂ = Rhizopus sp. and F₃ = Mixture of both.

Sub-plot treatments:
10 fungicidal treatments: T₅ = Control, T₁ = 2·8 gm. of Agrosan-G.N, T₂ = 1·9 gm. of cerasan, T₃ = 1·9 gm. of Lumasan, T₄ = 1·9 gm. of Hervasan, T₅ = 2·8 gm. of Thiram, T₆ = 1·9 gm. of Phygon x L, T₇ = 1·9 gm. of shell seed dresser, T₈ = 1·9 gm. of Merculine and T₉ = 1·9 gm. of P.C.N.B.

Fungicides were used for 1 Kg of seed.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/replication; 10 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 1·8 m x 1·4 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of pod. (iv) (a) 1962 to 1964 (Modified in 1963 and 1964). (b) N.A. (c) Nff. (v) to (vii) Nil.

5. RESULTS:
(i) 1385 Kg/ha. (ii) (a) 2850 Kg/ha. (b) 1104 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pods in Kg/ha.

<table>
<thead>
<tr>
<th></th>
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Mean: 1095 2184 1315 976 1712 1281 910 1718 1355 1335 1388
Crop: Groundnut (Kharif).
Site: Govt. Agri. Farm, Durgapura.

Object: To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Barley. (c) N.A. (ii) Sandy. (iii) 29.7.63. (iv) 6 ploughings. (b) N.A. (c) 72 seeds/plot for replication I and for treatment A in replication II and 48 seeds/plot for others. (d) 46 cm. x 23 cm. (e) Two. (v) N.A. (vii) R.S. 1. (vii) to (ix) N.A. (x) 4.11.63.

2. TREATMENTS:
Main-plot treatments:
3 fungus treatments of seed; \(F_1\) = Aspergillus sp. \(F_2\) = Rhizopus sp. and \(F_3\) = Mixture of both.

Sub-plot treatments:
16 seed treatments: \(T_0\) = Control, \(T_1\) = 3 gm. of Agrosan, \(T_2\) = 2 gm. of Ceresan, \(T_3\) = 2 gm. of Harvasan, \(T_4\) = 3 gm. of Thiram, \(T_5\) = 2 gm. of PhygonXL, \(T_6\) = 2 gm. of shell seed dresser, \(T_7\) = 2 gm. of Mercuine, \(T_8\) = 2 gm. of Captan, \(T_9\) = 2 gm. of F.C.N.B., \(T_{10}\) = Ceresan and Captan in the ratio 1:1, \(T_{11}\) = Ceresan and Captan in the ratio 2:1, \(T_{12}\) = Ceresan and Captan in the ratio 5:1, \(T_{13}\) = Ceresan and Thiram in 1:1 ratio, \(T_{14}\) = Ceresan and Thiram in 2:1 ratio and \(T_{15}\) = Ceresan and Thiram in 5:1 ratio.

3. DESIGN:
(i) Split-plot. (ii) 3 main-plots/replication; 16 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 1.8 m. x 1.4 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) No. of actual germinated plants/plot. (iv) (a) 1962-64 (In modified form in 1963 and 1964). (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 33.7 degrees. (ii) (a) 20.8 degrees. (b) 9.4 degrees. (iii) Main effects of F and T are highly significant. (iv) Av.% of plants germinated in degrees.

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C.D. for \(F\) marginal means = 10.3 degrees.
C.D. for \(T\) marginal means = 8.8 degrees.
Crop: Groundnut (Kharij).
Site: Govt. Agri. Farm, Durgapura.
Object: To determine the relative efficacy of seed dressing fungicides in relation to yield and germination of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Pea-Groundnut. (b) Pea. (c) N.A. (ii) Sandy. (iii) 11.7.64. (iv) (a) 2 ploughings. (b) Dibbling. (c) 32 seeds/plot. (d) 30 cm × 23 cm. (e) 1. (iv) 247 Kg/ha. of P₂O₅ by drilling+123.5 Kg/ha. of N by broadcasting. (vi) R.S. 1. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 12.11.64.

2. TREATMENTS:
   Main-plot treatments: 3 fungus treatments of seed: F₁ = Aspergillus, F₂ = Rhizopus sp. and F₃ = Mixture of both F₁+F₂.

   Sub-plot treatments: 16 seed treatments: T₀ = Control, T₁ = 3 gm. of Agrosan G.N., T₂ = 2 gm. of cereasan, T₃ = 2 gm. of phytgon XL, T₄ = 2 gm. of shell seed dresser, T₅ = 3 gm. of Thiram, T₆ = 2 gm. of Captan, T₇ = 2 gm. of Merculine D.A., T₈ = 2 gm. of Beej powder No. 4, T₉ = 2 gm. of Beej Powder No. 5, T₁₀ = 2 gm. of Beej Powder No. 6, T₁₁ = 2 gm. of Beej Powder No. 7, T₁₂ = 2 gm. of Beej Powder No. 8, T₁₃ = 2 gm. of Beej Powder No. 9, T₁₄ = 2 gm. of Thirasan and T₁₅ = Fungil only.

Above fungicides were used for 1 Kg. of seed.

3. DESIGN:
   (i) Split-plot with Lattice arrangements. (ii) (a) 16 plots/block, 3 blocks/replication. (b) N.A. (iii) 3. (iv) (a) and (b) 18 m. × 1.2 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) No. of plants germinated/plot and yield of pods. (iv) 1962-64 (Modified every year). (b) No. (c) Nil. (v) Jodhpur, Bharatpur and Udaipur. (vi) Nil. (vii) 89.7 Kg/ha. Aldrin 2% dust broadcasted and mixed with soil in the field before sowing.

5. RESULTS:
   (i) 5622 Kg/ha. (ii) (a) 2920 Kg/ha. (b) 2255 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of Groundnut in Kg/ha.

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<td>5850</td>
<td>4938</td>
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</table>
Crop :- Groundnut (Kharif).

Site :- Govt. Agri. Farm, Durgapura.

Object :- To determine the relative efficacy of seed dressing fungicides in rotation to yield and disease intensity and germination of Groundnut.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) N.A. (iii) 21.7.65. (iv) (a) Cross ploughing 4 times. (b) Dibbling. (c) N.A. (d) 30 cm x 30 cm. (e) 1. (v) 5·6 Kg/ha. of N+18 Kg/ha. of P₂O₅. (vi) R.S.—1. (vii) Unirrigated. (viii) and (ix) N.A. (x) 20.11.65.

2. TREATMENTS :
   Main-plot treatments :
   \[ M_1 = \text{Aspergillus, } M_2 = \text{Rhizopus and } M_3 = \text{Mixture of } M_1 + M_2. \]
   Sub-plot plot treatments :
   \[ S_1 = \text{Beej powder No. 5@ 2 gm/Kg., } S_2 = \text{Beej powder No. 6@ 2 gm/Kg., } S_3 = \text{Beej powder No. 6@ 2·5 gm/Kg., } S_4 = \text{Beej powder No. 9@ 2·5 gm/Kg., } S_5 = \text{Ceresan@ 3 gm/Kg., } S_6 = \text{Merculine@ 3 gm/Kg., } S_7 = \text{Agrosangm@ 3 gm/Kg., } S_8 = \text{Thiram@ 3 gm/Kg., } S_9 = \text{Fungus only and } S_{10} = \text{No treatment.} \]

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/replication, 10 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 2·7 m x 1·8 m. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) N.A. (iii) Yield of Groundnut. (iv) (a) 1965 only. (b) N.A. (c) Nil. (v) Bhusawar. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1072 Kg/ha. (ii) (a) 1114 Kg/ha. (b) 603 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pod in Kg/ha.

<table>
<thead>
<tr>
<th>Mean</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</table>

Crop :- Groundnut (Kharif).

Site :- Govt. Agri. Farm, Durgapura.

Object :-To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Groundnut.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Fallow. (c) N.A. (ii) Sandy. (iii) to (v) N.A. (vi) Local. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :
   8 fungicidal treatments : \[ T_0 = \text{Control, } T_1 = 2·8 gm/Kg. of Agrosan G.N., } T_2 = 1·9 gm/Kg. of Ceresan, T_3 = 1·9 gm/Kg. of Tillex, T_4 = 1·9 gm/Kg. of Lunasan, T_5 = 1·9 gm/Kg. of Hervasan, T_6 = 2·8 gm/Kg. of Fernasan and } T_7 = 3·7 gm/Kg. of Sulphur.
3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) and (b) 6.1 m. x 1.8 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of pod. (iv) (a) 1960 to 1964 [Treatments modified every year]. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 1736 Kg/ha. (ii) 595.8 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of pod in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₆</th>
<th>T₇</th>
<th>T₈</th>
<th>T₉</th>
<th>T₁₀</th>
<th>T₁₁</th>
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<tr>
<td>Av. yield</td>
<td>1970</td>
<td>1687</td>
<td>2118</td>
<td>1611</td>
<td>1437</td>
<td>1784</td>
<td>1932</td>
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</table>

Crop :- Groundnut *(Kharif).*  
Site :- Govt. Agri. Farm, Durgapura.

Object :-To determine the relative efficacy of seed dressing fungicides in relation to germination and yield of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Cow pea-Barley. (b) Barley. (c) Nil. (ii) Sandy. (iii) 13.7.61. (iv) (a) 4 ploughings. (b) Dibbling. (c) N.A. (d) 46 cm. between lines. (e) N.A. (v) N.A. (vi) R.S.—1. (vii) Nil. (viii) and (ix) N.A. (x) 12 to 15.12.61.

2. TREATMENTS:
   8 fungicidal treatments : F₆=0, F₁=2.8 gm. of Agrosan G.N., F₂=1.9 gm. of Ceresan, F₃=1.9 gm. of Tillex, F₄=1.9 gm. of Lunasan, F₅=1.9 gm. of Hervasan, F₆=2.8 gm. of Thiram and F₇=3.7 gm. of Sulphur.

3. DESIGN:

4. GENERAL:
   Same as in Expt. No. 60(17) on page 318.

5. RESULTS:
   (i) 796 Kg/ha. (ii) 285.5 Kg/ha. (iii) Treatment differences are significant. (iv) Av. yield of pods in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>F₆</th>
<th>F₇</th>
<th>F₈</th>
<th>F₉</th>
<th>F₁₀</th>
<th>F₁₁</th>
<th>F₁₂</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>474</td>
<td>788</td>
<td>1026</td>
<td>958</td>
<td>678</td>
<td>873</td>
<td>881</td>
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</table>

C.D.=334.9 Kg/ha.

Crop :- Groundnut *(Kharif).*  
Site :- Govt. Agri. Farm, Durgapura.

Object :-To determine the relative efficacy of seed dressing fungicides in relation to yield and germination of Groundnut.

1. BASAL CONDITIONS:
   (i) to (c) N.A. (ii) Sandy loam. (iii) N.A. (iv) (a) and (b) N.A. (c) 240 seeds/plot. (d) 46 cm. x 30 cm. (v) N.A. (vi) R.S.—1. (vii) to (x) N.A.
2. TREATMENTS:
8 fungicidal treatments: $F_0=0, F_1=2.8$ gm. of Agrosan G.N., $F_2=1.9$ gm. of Ceresan, $F_3=1.9$ gm. of Tillex, $F_4=1.9$ gm. of Lunasan, $F_5=2.8$ gm. of Thiram and $F_1=1.9$ gm. of Beej powder.

Fungicides were used for 1 Kg. of seed.

3. DESIGN: and 4. GENERAL:
Same as in Expt. No. 60(17) conducted at Durgapura on page 318.

5. RESULTS:
(i) 3675 Kg/ha. (ii) 976.6 Kg/ha. (iii) Treatment differences are highly significant. (iv) Av. yield of pod in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$F_0$</th>
<th>$F_1$</th>
<th>$F_2$</th>
<th>$F_3$</th>
<th>$F_4$</th>
<th>$F_5$</th>
<th>$F_6$</th>
<th>$F_7$</th>
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<tbody>
<tr>
<td>Av. yield</td>
<td>2338</td>
<td>3331</td>
<td>3939</td>
<td>2990</td>
<td>3828</td>
<td>4814</td>
<td>3818</td>
<td>4341</td>
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</table>

C.D. = 1145.1 Kg/ha.

_Crop :- Groundnut (Kharif).
Site :- Govt. Agri. Farm, Durgapura._

Ref :- Rj. 61(4).
Type :- 'D'.

Object :- To determine the relative efficacy of seed dressing fungicides in relation to yield and germination of Groundnut.

1. BASAL CONDITIONS:
(i) Pea—Groundnut. (b) Pea. (c) N.A. (ii) Sandy. (iii) 10.7.64. (iv) (a) 2 ploughings. (b) Dibbling. (c) 61.8 Kg/ha. (d) 30 cm. x 30 cm. (e) 1. (v) 4.9 Kgfha. of $P_6O_6$ by drilling and 4.9 Kg/ha. of AS by broadcasting. (vi) R.T. — 1. (vii) Unirrigated. (viii) 2 weedicings. (ix) N.A. (x) 9.11.64.

2. TREATMENTS:
10 seed dressing treatments: $T_0=0, T_1=3$ gm. of Agrosan G.N., $T_2=3$ gm. of Ceresan, $T_3=2$ gm. of Tillex, $T_4=2$ gm. of Lumasan, $T_5=3$ gm. of Hervasan, $T_6=2$ gm. of Thiram, $T_7=2$ gm. Phygoa X.L., $T_8=2$ gm. of Shell seed dresser and $T_9=2$ gm. of Merculine.

Above fungicides were used for 1 Kg/ha. of seed.

3. DESIGN:
(i) Incomplete L. Sq. (ii) (a) 3 plots/block ; 10 blocks/Sq. and 3 Sqs. (b) N.A. (iii) 9. (iv) (a) and (b) 1'3 m. x 1'4 m. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) B.H.C. powder broadcasted before sowing. Incidence of diseases and pests as per results. (iii) No. of plants germinated/plot, and yield of pod. (iv) (a) 1952—54 [Modified every year]. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 75.8 degree. (ii) 7.8 degree. (iii) Treatment differences are significant. (iv) Av. % germination in degree.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
<th>$T_8$</th>
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</thead>
<tbody>
<tr>
<td>Av. germination in degrees.</td>
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<td>84</td>
<td>80</td>
<td>73</td>
<td>71</td>
<td>79</td>
<td>76</td>
<td>76</td>
<td>76</td>
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</table>

C.D. = 14.4 degree.

(i) 3451 Kg/ha. (ii) 914.0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
<th>$T_8$</th>
<th>$T_9$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield.</td>
<td>3365</td>
<td>3987</td>
<td>3620</td>
<td>3556</td>
<td>2671</td>
<td>3919</td>
<td>3676</td>
<td>3018</td>
<td>3540</td>
<td>3161</td>
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</table>
Crop: Groundnut (Kharif).

Site: Bhinder Panchayat Samiti, Udaipur.

Object: To determine the relative efficacy of different seed dressing fungicides in relation to germination and yield of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Sandy loam. (iii) N.A. (iv) (a) and (b) N.A. (c) 81 seeds/plot. (d) and (e) N.A. (v) N.A. (vi) Local. (vii) to (x) N.A.

2. TREATMENTS:
   Main-plot treatments
   3 fungus treatments of seed: $F_1$ = Aspergillus, $F_2$ = Rhizopus sp. and $F_3$ = Mixture of both.
   Sub-plot treatments:
   4 seed treatments: $T_0$ = Untreated Seed, $T_1$ = Seed treated with Thiram, $T_2$ = Seed treated with Merculine and $T_3$ = Seed treated with Beej powder.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 1'8 m. x 1'4 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of pod. (iv) (a) 1962 only. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:
   (i) 1144 Kg/ha. (ii) (a) 396'7 Kg/ha. (b) 83'8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of pod in Kg/ha.

---

Crop: Groundnut (Kharif).

Site: Govt. Agri. Farm, Udaipur.

Object: To determine the relative efficacy of seed dressing fungicides in relation to yield and germination of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) Clay loam. (iii) 13.7.64. (iv) (a) 4 ploughings. (b) Dibbling. (c) 32 seeds/plot. (d) 30 cm. x 23 cm. (e) I. (v) 49'4 Kg/ha. of $P_2O_5$ by drilling + 3.7 C.L./ha. of F.Y.M. by broadcasting. (vii) Irrigated. (viii) 3 weedings. (ix) N.A. (x) 14 to 16.11.64.

2. TREATMENTS:
   Main-plot treatments:
   3 fungus treatments of seed: $F_1$ = Aspergillus, $F_2$ = Rhizopus sp. and $F_3$ = Mixture of both $F_1 + F_2$.
   Sub-plot treatments:
   16 seed treatments: $T_0$ = Control, $T_1$ = 3 gm. of Agrosan G.N., $T_2$ = 2 gm. of Ceresan, $T_3$ = 2 gm. of Phyon XL, $T_4$ = 2 gm. of Shell seed dresser, $T_5$ = 2 gm. of Merculine DA, $T_6$ = 2 gm. of Thiram, $T_7$ = 2 gm. of Captan, $T_8$ = 2 gm. of Beej powder No. 4, $T_9$ = 2 gm. of Beej powder No. 5, $T_{10}$ = 2 gm. of B.P. No. 6, $T_{11}$ = 2 gm. of B.P. No. 7, $T_{12}$ = 2.5 gm. of B.P. No. 8, $T_{13}$ = 2.5 gm. of B.P. No. 9, $T_{14}$ = 2 gm. of Tritisan and $T_{15}$ = Fungii only.

Above fungicides were used for 1 Kg. of seed.
3. DESIGN:
   (i) Split-plot with Lattice arrangements. (ii) (a) 16 plots/block, 3 blocks/replication. (b) N.A. (iii) 3.
   (iv) (a) and (b) 1.8 m. x 1.2 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Germination %, Groundnut yield; Total no. of plants/plot at the time of harvest.
   (iv) (a) 1964 only. (b) No. (c) N.A. (v) Dungarpura, Jodhpur and Bharatpur. (vi) N.A. (vii) Aldrin
   2% dust broadcasted and mixed with soil before sowing 80 lb/ac.

5. RESULTS:
   (i) 1702 Kgm/ha. (ii) (a) 2597 Kgm/ha. (b) 827 Kgm/ha. (iii) None of the effects is significant. (iv) Av. yield
   of pod in Kg/ha.

<table>
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<tr>
<th></th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
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(i) 50.1 degrees. (ii) (a) 11.6 degrees. (b) 7.5 degrees. (iii) Main effect of T alone is significant. (iv) Av.
% of seed germinated (in degrees).

<table>
<thead>
<tr>
<th></th>
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<th>T₄</th>
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</tr>
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</table>

C.D. for T marginal means = 5.2 degrees.

Crop :- Mustard (Rabi).
Site :- Govt. Seed. Multiplication Farm, Ora, Sirohi.
Object :- To study the effect of N and P on the growth and yield of Mustard.
1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Heavy soils. (iii) N.A. (iv) (a) and (b) N.A. (c) 2 Kg/ha. (d) 61 cm. between rows. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 4 levels of N as A/S: \( N_0 = 0, N_1 = 22.4, N_2 = 44.8 \) and \( N_3 = 67.2 \) Kg/ha.
(2) 3 levels of \( P_2O_5 \) as Super: \( P_0 = 0, P_1 = 22.4 \) and \( P_2 = 44.8 \) Kg/ha.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 5.5 m. x 3.7 m. (b) 4.9 m. x 3.1 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of seed. (iv) (a) 1961 only. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 16.8 Kg/ha. (ii) 44.4 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of seed in Kg/ha.

<table>
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C.D. for N marginal means = 26.1 Kg/ha.

---

Crop: Mustard (Rabi).
Site: Govt. Agri. Farm, Sewar.

Object: To study the effect of N, P and K on the yield of Mustard.

1. BASAL CONDITIONS:
(i) (a) Fallow Mustard. (b) Fallow. (c) N.A. (ii) N.A. (iii) 13.11.61. (iv) (a) 2 ploughings. (b) N.A. (c) 3 Kg/ha. (d) 45 cm. between rows. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) and (ix) N.A. (x) 17.4.62.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N : \( N_0 = 0, N_1 = 49.1 \) and \( N_2 = 80.2 \) Kg/ha.
(2) 3 levels of \( P_2O_5 \) : \( P_0 = 0, P_1 = 98.5 \) and \( P_2 = 200.5 \) Kg/ha.
(3) 3 levels of \( K_2O \) : \( K_0 = 0, K_1 = 32.8 \) and \( K_2 = 65.6 \) Kg/ha.

3. DESIGN:
(i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 2. (iv) (a) 9.0 m. x 6.1 m. (b) 8.1 m. x 4.9 m. (v) 45 cm. x 61 cm. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Yield of seed. (iv) (a) 1961 only. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 729 Kg/ha. (ii) 339.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of seed in Kg/ha.
Crop :- Mustard (Rabi).
Ref :- Rj. 64(58), 65(31).
Type :- 'M'.

Object :- To find out the fertilizers requirement of Mustard under water scarcity conditions.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 6.10.1964 ; 26.10.1965. (iv) (a) Ploughings with tractor and desi plough. (b) Behind the plough. (c) 2.5 to 5 Kg/ha. (d) 46 cm. between rows for 64(58); 46 cm. x 23 cm. for other. (e) Nil. (v) Nil for 64(58); N.A. for other. (vi) L—18. (vii) Irrigated. (viii) 2 hoeings by hand hoe. (ix) 1 cm. for 64(58); N.A. for other. (x) 20.3.1965; 27.3.1966.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 4 levels of N : N₁ =0, N₂ =18.5, N₃ =37.1 and N₄ =55.6 Kg/ha.
   (2) 3 levels of P₄O₅ : P₄ =0, P₁ =18.5 and P₂ =37.1 Kg/ha.

3. DESIGN :
   (i) Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 5.5 m. x 3.7 m. (b) 4.6 m. x 2.7 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Nil. (iii) Yield of seed. (iv) (a) 1964—1965. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since the error variances are heterogeneous and Treatments x years interaction is absent, results of individual years are presented under 5. Results.

5. RESULTS :
   64(58)
   (i) 1216 Kg/ha. (ii) 419.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of seed in Kg/ha.

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65(31)
   (i) 408 Kg/ha. (ii) 167.0 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of seed in Kg/ha.

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Crop: Mustard (Rabi).
Site: Govt. Agri. Res. Farm, Sriganganagar.

Object: To study the effect of different types and levels of N at different levels of P and K on the yield of Mustard.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 31.10.61. (iv) (a) 4 ploughings. (b) Sown as drilled. (c) 2 Kg/ha. (d) Row t x 30 cm. (e) N.A. (v) N.A. (vi) L 18. (vii) 4 irrigated. (viii) 3 weedings and hoeings. (ix) N.A. (x) 29.3.62 to 9.4.62.

2. TREATMENTS:
   Main-plot treatments:
   5 nitrogenous treatments: \( \text{N}_0 = \text{N}_4 = 33.6 \text{ Kg/ha. of N as A/S}, \text{N}_2 = 67.2 \text{ Kg/ha. of N as A/S}, \text{N}_3 = 33.6 \text{ Kg/ha. of N as Cal. Am. Sulph. and N}_4 = 67.2 \text{ Kg/ha. of N as Cal. A/S.} \)
   Sub-plot treatments:
   All combination of (1) and (2)
   (1) 3 levels of \( \text{P}_2 \text{O}_5: \text{P}_0 = 0, \text{P}_1 = 33.6 \text{ and P}_2 = 67.2 \text{ Kg/ha.} \)
   (2) 2 levels of \( \text{K}_2 \text{O}: \text{K}_0 = 0 \text{ and K}_1 = 33.6 \text{ Kg/ha.} \)

3. DESIGN:
   (i) Split-plot. (ii) (a) 5 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 9'2 m. x 5'5 m. (b) 7.4 m. x 3'7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of mustard. (iv) (a) 1961-contd. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:
   (i) 1260 Kg/ha. (ii) (a) 2060 Kg/ha. (b) 1454 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of mustard in Kg/ha.

\[
\begin{array}{c|ccccc|c}
\text{N}_0 & \text{N}_1 & \text{N}_2 & \text{N}_3 & \text{N}_4 & \text{Mean} \\
\hline
\text{P}_0 & 396 & 417 & 331 & 514 & 414 \\
\text{P}_1 & 368 & 329 & 466 & 414 & 394 \\
\text{P}_2 & 329 & 346 & 419 & 570 & 416 \\
\text{Mean} & 364 & 364 & 405 & 499 & 408 \\
\end{array}
\]

C.D. for N marginal means = 129.7 Kg/ha.

\[
\begin{array}{c|cccc|c}
\text{N}_0 & \text{N}_1 & \text{N}_2 & \text{N}_3 & \text{N}_4 & \text{Mean} \\
\hline
\text{K}_0 & 1105 & 1270 & 1286 & 1284 & 1426 \\
\text{K}_1 & 1129 & 1199 & 1276 & 1283 & 1341 \\
\text{Mean} & 1117 & 1234 & 1281 & 1284 & 1383 \\
\text{P}_0 & 1163 & 1219 & 1249 & 1293 & 1375 \\
\text{P}_1 & 1060 & 1277 & 1404 & 1300 & 1320 \\
\text{P}_2 & 1129 & 1208 & 1191 & 1258 & 1456 \\
\text{Mean} & 1259 & 1272 & 1248 & & 1260 \\
\end{array}
\]
Crop :- Mustard (Rabi).
Ref :- Rj. 62(108), 63(19).
Site :- Govt. Agri. Res. Farm, Sriganganagar. Type :- 'M'.
Object :- To study the effect of different types and levels of N with different levels of P and K on the yield of Mustard.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow for 63(19); Cotton for 62(108). (c) Nil. (ii) Sandy loam. (iii) 17.10.62; 2-11.63. (iv) (a) 4 ploughings. (b) Drilling for 62(108); N.A. for 63(19). (c) 2 Kg/ha. (d) 23 cm. between rows for 62(108); 30 cm. x 23 cm. for 63(19). (e) N.A. (v) N.A. for 62(108); Nil for 63(19). (vi) L-18. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 22, 23:3.1963; 5.4.1964.

2. TREATMENTS:
   Main-plot treatments :
   All combinations of (1) and (2) with a control. 
   (1) 2 levels of N : N₁ = 33.6 and N₂ = 67.2 Kg/ha.
   (2) 2 sources of N : S₁ = A/S and S₂ = C/A/N.
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of P₀ as Super : P₀ = 0, P₁ = 33.6 and P₂ = 67.2 Kg/ha.
   (2) 2 levels of K₀ as Mur. Pot. : K₀ = 0 and K₁ = 33.6 Kg/ha.

3. DESIGN :
(i) Split-plot. (ii) (a) 5 main-plots/replication ; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 7.4 m. x 5.5 m. (b) 6.2 m. x 4.3 m. (v) 61 cm. x 61 cm. (vi) Yes.

4. GENERAL:
(i) Normal for 62(108); poor for 63(19). (ii) Nil for 62(108); Attack of jassids controlled by spraying Akodin for 63(19). (iii) Yield of mustard. (iv) (a) 1961 to 1963 (treatments modified in 62). (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5 results.

5. RESULTS:
62(108)
(i) 1414 Kg. ha. (ii) (a) 407.4 Kg/ha. (b) 178.8 Kg/ha. (iii) 'Control vs. others' is highly significant and main effect of P is significant. (iv) Av. yield of seed in Kg/ha.

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without Nitrogen

with Nitrogen

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</table>
C.D. for P marginal means = 89.2 Kg/ha.
C.D. for 'control mean vs. others' = 202.6 Kg/ha.

63(19)

(i) 477 Kg/ha. (ii) (a) 270 Kg/ha. (b) 113 Kg/ha. (iii) Main effect of P is highly significant and interaction S×N×P is significant. (iv) Av. yield of seed in Kg/ha.

Control (No. N) mean = N.A.

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<td>461</td>
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</table>

C.D. for P marginal means = 56.3 Kg/ha.

Crop : Mustard (Rabi).
Site : Govt. Agri. Res. Farm, Sriganganagar.

Object : To study the effect of N and P on the yield of Mustard.

1. BASAL CONDITIONS :
(i) (a) N.A. (b) Wheat for 62(43); N.A. for 63(66). (c) Nil for 62(43); N.A. for 63(66). (ii) Sandy loam. (iii) 3.10.1962; N.A. (iv) (a) 3 ploughings for 62(43); N.A. for 63(66). (b) N.A. (c) 3 Kg/ha, for 62(43); N.A. for 63(66). (d) 46 cm. between rows. (e) N.A. (v) N.A. for 62(43); Nil for 63(66). (vi) R.L. 13 for 62(43); R.L. 18 for 63(66). (vii) Irrigated. (viii) 2 weedings for 62(43); N.A. for 63(66). (ix) N.A. (x) 3.4.1963; 24.3.1964.

2. TREATMENTS :
Main-plot treatments:
4 methods of application of manures : M1 = Whole fertilizers by broadcast at sowing, M2 = Whole fertilizers by drilling at sowing, M3 = N + full dose of \( P_2O_5 \) by broadcasting + \( \frac{1}{2} N \) as top dressing and M4 = \( \frac{1}{2} N \) + full dose of \( P_2O_5 \) as drilling + \( \frac{1}{2} N \) as top dressing.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 3 levels of N : \( N_0 = 0 \), \( N_1 = 33.6 \) and \( N_2 = 67.2 \) Kg/ha.
(2) 3 levels of \( P_2O_5 \) : \( P_0 = 0 \), \( P_1 = 33.6 \) and \( P_2 = 67.2 \) Kg/ha.

3. DESIGN:
(i) Split-plot. (iii) 4 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 5.5 m. x 4.6 m. for 62(43); 5.5 m. x 3.7 m. for 63(66). (b) 4.6 m. x 3.7 m. for 62(43); 4.6 m. x 2.7 m. for 63(66). (v) 46 cm. x 46 cm. (vi) Yes.
4. GENERAL:
(i) N.A. for 62(43); Good for 63(66). (ii) N.A. for 62(43); Nil for 63(66). (iii) Yield of seed. (iv) (a) 1962–1964 [treatments modified in 64]. (b) No. (c) Nil. (v) N.A. (vi) Nil. (vii) Since the main-plot error variances are heterogeneous and main-plot treatments X years interaction is absent. Results of individual years are presented under 5. Results.

5. RESULTS:

62(43)
(i) 1581 Kg/ha. (ii) (a) 777.4 Kg/ha. (b) 275.1 Kg/ha. (iii) Main effects of N and P are highly significant. (iv) Ave. yield of seed in Kg/ha.

<table>
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<th>M₃</th>
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C.D. for N or P marginal means = 129.5 Kg/ha.

63(66)
(i) 1078 Kg/ha. (ii) (a) 279.0 Kg/ha. (b) 236.0 Kg/ha. (iii) Main effects of N and P are highly significant. (iv) Ave. yield of seed in Kg/ha.

<table>
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<th>M₃</th>
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</table>

C.D. for N or P marginal means = 111.1 Kg/ha.

---

Crop: Mustard (Rabi).

Site: Govt. Agri. Res. Farm, Sriganganagar.

Object: To study the effect of different methods of application of N and P at various levels on the yield of Mustard.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 3.11.64. (iv) (a) 3 ploughings. (b) Behind the plough. (c) 74 Kg/ha. (d) 23 cm. between rows. (e) N.A. (v) Nil. (vi) R.L. 18. (vii) Irrigated. (viii) 2 hand hoings. (ix) N.A. (x) 9.4.65.
2. TREATMENTS:

Main-plot treatments:

4 methods of application: \( M_1 = \text{Whole fertilizers at sowing by broadcasting} \), \( M_2 = \text{Whole fertilizers at sowing by drilling} \), \( M_3 = \frac{1}{2} \text{N+full dose of P}_2\text{O}_5 \) by broadcasting and \( \frac{1}{2} \text{N as top dressing} \) and \( M_4 = \frac{1}{2} \text{N+full dose of P}_2\text{O}_5 \) by drilling + \( \frac{1}{2} \text{N as top dressing} \).

Sub-plot treatments:

All combinations of (1) and (2):

(1) 3 levels of N: \( N_0 = 0, N_1 = 37.1 \) and \( N_2 = 74.1 \) Kg/ha.

(2) 3 levels of \( P_2O_5 \): \( P_0 = 0, P_1 = 37.1 \) and \( P_2 = 74.1 \) Kg/ha.

3. DESIGN:

Same as in Expt. No. 63(66) on page 327.

4. GENERAL:

Same as in Expt. No. 63(66) on page 327.

5. RESULTS:

(i) 1325 Kg/ha.

(ii) (a) 138.6 Kg/ha. (b) 221.4 Kg/ha.

(iii) Main effect of N alone is highly significant. Main effects of M and P are significant. (iv) Av. yield of seed in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>( M_1 )</th>
<th>( M_2 )</th>
<th>( M_3 )</th>
<th>( M_4 )</th>
<th>Mean</th>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_0 )</td>
<td>1082</td>
<td>1169</td>
<td>1044</td>
<td>1161</td>
<td>1114</td>
<td>1055</td>
<td>1070</td>
<td>1216</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>1267</td>
<td>1484</td>
<td>1340</td>
<td>1434</td>
<td>1381</td>
<td>1343</td>
<td>1400</td>
<td>1401</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>1509</td>
<td>1456</td>
<td>1376</td>
<td>1579</td>
<td>1480</td>
<td>1353</td>
<td>1545</td>
<td>1540</td>
</tr>
<tr>
<td>Mean</td>
<td>1286</td>
<td>1370</td>
<td>1253</td>
<td>1391</td>
<td>1325</td>
<td>1250</td>
<td>1338</td>
<td>1386</td>
</tr>
<tr>
<td>( P_0 )</td>
<td>1216</td>
<td>1246</td>
<td>1215</td>
<td>1325</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( P_1 )</td>
<td>1263</td>
<td>1483</td>
<td>1201</td>
<td>1407</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>( P_2 )</td>
<td>1378</td>
<td>1380</td>
<td>1344</td>
<td>1441</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C.D. for M marginal means = 92.2 Kg/ha.

C.D. for N or P marginal means = 104.5 Kg/ha.

---

Crop: Mustard (Rabi).

Ref: Rj. 65(30).

Site: Govt. Agri. Res. Farm, Sriganganagar.

Type: 'M'.

Object: To study the effect of different methods of application of N on the yield of Mustard.

1. BASAL CONDITIONS:

(i) (a) No. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 26.10.65. (iv) (a) Ploughing. (b) Behind the plough. (c) 2.5 Kg/ha. (d) 46 cm x 23 cm. (e) N.A. (v) N.A. (vi) L. 18. (vii) Irrigated. (viii) 2 hand hoeings. (ix) N.A. (x) 27.3.66.

2. TREATMENTS:

Main-plot treatments:

3 methods of application: \( M_1 = \text{Full fertilizer as soil application at sowing} \), \( M_2 = \text{\frac{1}{2} soil and \frac{1}{2} as foliar application} \) and \( M_3 = \text{Full as foliar application in 2 splits} \).

Sub-plot treatments:

All combinations of (1) and (2):

(1) 3 levels of N: \( N_0 = 0, N_1 = 18.5 \) and \( N_2 = 37.1 \) Kg/ha.

(2) 2 levels of phosphate: \( P_0 = 0 \) and \( P_1 = 24.7 \) Kg/ha.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/replication, 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 5.5 m x 3.7 m. (b) 4.9 m x 2.7 m. (v) 30 cm x 46 cm. (vi) Yes.
4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of Mustard. (iv) (a) 1963 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 230 Kg/ha. (ii) (a) 110.3 Kg/ha. (b) 60.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of Mustard in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>P1</th>
<th>P2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>185</td>
<td>213</td>
<td>283</td>
<td>233</td>
<td>221</td>
<td>227</td>
</tr>
<tr>
<td>M2</td>
<td>270</td>
<td>291</td>
<td>256</td>
<td>265</td>
<td>280</td>
<td>272</td>
</tr>
<tr>
<td>M3</td>
<td>169</td>
<td>173</td>
<td>228</td>
<td>190</td>
<td>191</td>
<td>190</td>
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<tr>
<td>Mean</td>
<td>208</td>
<td>226</td>
<td>256</td>
<td>229</td>
<td>231</td>
<td>230</td>
</tr>
</tbody>
</table>

Crop: Mustard.  
Ref: Rj. 62, 64 (S.F.T.)

Site: (District): Sriganganagar.  
Type: 'M'.

Object: To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients (Type: A).

1. BASAL CONDITIONS:
   (i) N.A. (ii) Desert soil. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   8 manurial treatments
   O = Control (no manure).
   N1 = 33.6 Kg/ha. of N.
   N2 = 67.2 Kg/ha. of N.
   P1 = 16.8 Kg/ha. of P₂O₅.
   N₁P₁ = 33.6 Kg/ha. of N + 16.8 Kg/ha. of P₂O₅.
   N₂P₁ = 67.2 Kg/ha. of N + 16.8 Kg/ha. of P₂O₅.
   N₁P₂ = 57.2 Kg/ha. of N + 33.6 Kg/ha. of P₂O₅ + 16.8 Kg/ha. of K₂O.
   N applied as A/S; P₂O₅ as Super and K₂O as Mur. Pot.

3. DESIGN:
   A selected district is divided into four agriculturally homogeneous blocks based on climate, soil, cropping pattern etc. In each block 24 plots are selected at random. A block normally consists of a group of 50-100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A₁, 11 of type A₂, 11 of type A₃, and 3 are of type C. The eleven experiments under type A₁, A₂, and A₃ are distributed as 3 on a kharif cereal, 3 on a rabi cereal, 3 on a cash crop and 2 on oil seed. All the three type-C experiments are conducted on a legume crop. For the purpose of conducting the A₁, A₂, and A₃ experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type A₁, A₂, and A₃ are laid out. For conducting the three type-C trials three villages are randomly selected in each block.

4. GENERAL:
   (i) to (iii) N.A. (iv) (a) 1962 to 1966. (b) and (c) N.A. (v) to (vii) N.A.
5. RESULTS:

**62 (S.F.T.)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&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;2&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;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of mustard in Kg/ha.</td>
<td>272</td>
<td>262</td>
<td>110</td>
<td>275</td>
<td>304</td>
<td>430</td>
</tr>
</tbody>
</table>

Control yield = 441 Kg/ha.; No. of trials = 8.

**64 (S.F.T.)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&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;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of mustard in Kg/ha.</td>
<td>181</td>
<td>300</td>
<td>64</td>
<td>236</td>
<td>319</td>
<td>403</td>
</tr>
</tbody>
</table>

Control yield = 572 Kg/ha.; No. of trials = 5.

**Crop:** Mustard.  
**Site:** (District): Sriganganagar.  
**Ref:** 62, 64 (S.F.T.).  
**Type:** 'M'.

Object: To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients (Type: A<sub>2</sub>).

1. BASAL CONDITIONS:
   (i) N.A.  (ii) Desert soil.  (iii) to (vi) N.A.  (vii) Irrigated.  (viii) to (x) N.A.

2. TREATMENTS:

8 manural treatments

- O = Control (no manure)
- N<sub>1</sub> = 33.6 Kg/ha. of N
- P<sub>1</sub> = 16.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub>
- P<sub>2</sub> = 33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub>
- N<sub>1</sub>P<sub>1</sub> = 33.6 Kg/ha. of N + 16.8 Kg/ha. of P<sub>2</sub>O<sub>5</sub>
- N<sub>1</sub>P<sub>2</sub> = 33.6 Kg/ha. of N + 33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub>
- N<sub>1</sub>P<sub>2</sub>K<sub>2</sub> = 67.2 Kg/ha. of N + 33.6 Kg/ha. of P<sub>2</sub>O<sub>5</sub> + 33.6 Kg/ha. of K<sub>2</sub>O

3. DESIGN:

- Same as in type A<sub>1</sub> (Irrigated) on page No. 330.

4. GENERAL:

   (i) to (iii) N.A.  (iv) (a) 1962 to 1966.  (b) and (c) N.A.  (v) to (vii) N.A.

5. RESULTS.

**62 (S.F.T.)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;</th>
<th>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;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of mustard in Kg/ha.</td>
<td>74</td>
<td>15</td>
<td>100</td>
<td>171</td>
<td>251</td>
<td>345</td>
<td>479</td>
</tr>
</tbody>
</table>

Control yield = 559 Kg/ha.; No. of trials = 8.

**64 (S.F.T.)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;</th>
<th>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;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of mustard in Kg/ha.</td>
<td>238</td>
<td>88</td>
<td>128</td>
<td>270</td>
<td>299</td>
<td>516</td>
<td>535</td>
</tr>
</tbody>
</table>

Control yield = 737 Kg/ha.; No. of trials = 7.
Crop: Mustard.  
Site: (District) Sriganganagar.  

Object: To study response curves of important cereal, cash and oilseed crops to Potash applied singly and in combination with other nutrients (Type: A).

1. BASAL CONDITIONS:
   (i) N.A.  (ii) Desert soils.  (iii) to (vi) N.A.  (vii) Irrigated.  (viii) to (x) N.A.

2. TREATMENTS:
   8 manurial treatments:
   - O = Control (no manure)
   - $N_1 = 33.6$ Kg/ha. of N
   - $K_1 = 16.8$ Kg/ha. of $K_2O$
   - $K_2 = 33.6$ Kg/ha. of $K_2O$
   - $N_1K_1 = 33.6$ Kg/ha. of $N + 16.8$ Kg/ha. of $K_2O$
   - $N_1K_2 = 33.6$ Kg/ha. of $N + 33.6$ Kg/ha. of $K_2O$
   - $N_2K_1 = 67.2$ Kg/ha. of $N + 33.6$ Kg/ha. of $K_2O$
   - $N_1P_1K_1 = 33.6$ Kg/ha. of $N + 33.6$ Kg/ha. of $P_2O_5 + 16.8$ Kg/ha. of $K_2O$

3. DESIGN:
   Same as in type A (Irrigated) on page 330.

4. GENERAL:
   (i) to (iii) N.A.  (iv) (a) 1932 to 1935.  (c) 1955.  (v) a & f (c) N.A.  (vi) a & f (vi) N.A.  (vii) Expt. rejected.

5. RESULTS:

   62 (S.F.T.)
<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$K_1$</th>
<th>$K_2$</th>
<th>$N_1K_1$</th>
<th>$N_1K_2$</th>
<th>$N_1K_3$</th>
<th>$N_1P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Mustard in Kg/ha.</td>
<td>226</td>
<td>101</td>
<td>115</td>
<td>267</td>
<td>262</td>
<td>330</td>
<td>470</td>
<td>64.3</td>
</tr>
</tbody>
</table>

   Control yield = 433 Kg/ha.; No. of trials = 7.

   63 (S.F.T.)
<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$K_1$</th>
<th>$K_2$</th>
<th>$N_1K_1$</th>
<th>$N_1K_2$</th>
<th>$N_1K_3$</th>
<th>$N_1P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Mustard in Kg/ha.</td>
<td>105</td>
<td>19</td>
<td>25</td>
<td>79</td>
<td>104</td>
<td>221</td>
<td>139</td>
<td>18.8</td>
</tr>
</tbody>
</table>

   Control yield = 198 Kg/ha.; No. of trials = 4.

   64 (S.F.T.)
<table>
<thead>
<tr>
<th>Treatment</th>
<th>$N_1$</th>
<th>$K_1$</th>
<th>$K_2$</th>
<th>$N_1K_1$</th>
<th>$N_1K_2$</th>
<th>$N_1K_3$</th>
<th>$N_1P_1K_1$</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Mustard in Kg/ha.</td>
<td>229</td>
<td>50</td>
<td>51</td>
<td>266</td>
<td>285</td>
<td>445</td>
<td>385</td>
<td>36.8</td>
</tr>
</tbody>
</table>

   Control yield = 636 Kg/ha.; No. of trials = 6.
1. BASAL CONDITIONS:
   (i) N.A.  (ii) Desert soil.  (iii) to (x) N.A.

2. TREATMENTS:
   O =Control (no manure)
   N =22'4 Kg/ha. of N as A/S
   P =22'4 Kg/ha. of P₂O₅ as Super.
   K =22'4 Kg/ha. of K₂O as Mur. Pot.
   NP =22'4 Kg/ha. of N as A/S+22'4 Kg/ha. of P₂O₅ as Super.
   NK =22'4 Kg/ha. of N as A/S+22'4 Kg/ha. of K₂O as Mur. Pot.
   NPK =22'4 Kg/ha. of N as A/S+22'4 Kg/ha. of P₂O₅ as Super+22'4 Kg/ha. K₂O as Mur. Pot.

3. DESIGN:
   (i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on kharif cereal, 8 on a rabi cereal, 8 on cash crop, 4 on an oil seed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the four zones at the rate of one experiment per village. (iii) (a) 1/98'8 ha.  (b) 1/197'7 ha.  (iv) Yes.

4. GENERAL:
   (i) to (vii) N.A.

5. RESULTS:
<table>
<thead>
<tr>
<th>Effect</th>
<th>Response to</th>
<th>Interaction effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Mustard Kg/ha.</td>
<td>150</td>
<td>120</td>
</tr>
</tbody>
</table>

   Control yield=640 Kg/ha., and No. of trials=5.

   Crop :- Mustard.  Site :- Sriganganagar.

   Objec' : Type B :-To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS:
   (i) N.A.  (ii) Desert soil.  (iii) to (x) N.A.

2. TREATMENTS:
   O =Control (no manure)
   n₁ =22'4 Kg/ha. of N as A/S.
   n₂ =44'8 Kg/ha. of N as A/S.
   n₁' =22'4 Kg/ha. of N as Urea.
   n₂' =44'8 Kg/ha. of N as Urea.
   n₁'' =22'4 Kg/ha. of N as C/A/N.
   n₂'' = 44'8 Kg/ha. of N as C/A/N.

3. DESIGN:
   Same as in type A. on page 333.

4. GENERAL:
   (i) to (vii) N.A.
5. RESULTS:

Treatment
Av. yield of Mustard in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>n₀</th>
<th>n₁</th>
<th>n₂</th>
<th>n₃</th>
<th>n₄</th>
<th>n₅</th>
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<tbody>
<tr>
<td>O</td>
<td>630</td>
<td>700</td>
<td>990</td>
<td>690</td>
<td>870</td>
<td>890</td>
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</tr>
<tr>
<td>n₃</td>
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</tr>
<tr>
<td>n₄</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>n₅</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

G.M. = 807 Kg/ha. S.E./Mean = 29.7 Kg/ha. and No. of trials = 4.

Crop: Mustard.

Site: Govt. Agri. Res. Farm, Sultanpur.

Type: 'MV'.

Object: To find out the requirement of N and P for different varieties of Mustard.

1. BASAL CONDITIONS:

(i) (a) No. (b) Fallow. (c) Nil. (ii) N.A. (iii) 18.10.65. (iv) (a) Bakhering. (b) Digging. (c) N.A. (d) Between lines 30 cm. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Irrigation. (viii) Nil. (ix) N.A. (x) 2.3.66.

2. TREATMENTS:

Main-plot treatments:

Sub-plot treatments:
All combinations of (1) and (2).

(1) 4 levels of N: N₃ = 3, N₄ = 33.6, N₅ = 57.2 and N₆ = 109.9 Kg/ha.

(2) 3 levels of P₂O₅: P₃ = 3, P₄ = 33.6 and P₅ = 57.2 Kg/ha.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/replication; 12 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 5.5 m. x 2.4 m. (b) 3.1 m. x 1.8 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:

(i) Normal. (ii) Nil. (iii) No. of branches/plant, and yield of mustard. (iv) (a) 1965 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:

(i) 1057 Kg/ha. (ii) (a) 583.2 Kg/ha. (b) 390.2 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of grain in Kg/ha.

Mustard seed:

<table>
<thead>
<tr>
<th>N₃</th>
<th>N₁</th>
<th>N₂</th>
<th>P₀</th>
<th>P₁</th>
<th>P₃</th>
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<td>1196</td>
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<td>822</td>
<td>1136</td>
<td>1116</td>
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Mean | 998 | 1054 | 1024 | 1151 | 1075 | 1123 | 972 | 1057 |

P₅ | 998 | 1155 | 1065 | 1082 |
P₆ | 1076 | 1043 | 1065 | 1306 |
P₇ | 919 | 964 | 942 | 1065 |
Crop :- Mustard (Rabi).
Site :- Govt. Seed Multiplication Farm, Ora, Sirohi.

Object :- To study the effect of different seed rates and spacings on growth and yield of Mustard.

1. BASAL CONDITIONS;
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Heavy soil. (iii) 4.11.62. (iv) (a) and (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) 22.4 Kg/ha, of N by broadcasting and 22.4 Kg/ha. of P as drilling before sowing. (vi) Local. (vii) Irrigated. (viii) 1 weeding. (ix) N.A. (x) 28.3.63.

2. TREATMENTS:
   Main-plot treatments :
   4 spacings between rows : S₁ =30, S₂ =46, S₃ =61 and S₄ =91 cm.
   Sub-plot treatments :
   4 seed rates : R₁ =1.2, R₂ =2.5, R₃ =3.7 and R₄ =4.9 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 5 5 m. x 3.7 m. (b) 4.9 m. x 3.1 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of seed. (iv) to (vii) N.A.

5. RESULTS:
   (i) 244 Kg/ha. (ii) (a) 132.9 Kg/ha. (b) 83.8 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of seed in Kg/ha,

<table>
<thead>
<tr>
<th></th>
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<th>S₃</th>
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<td>356</td>
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<td>244</td>
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</table>
3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication; 9 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) *a) 5·5 m. 
   x 3·7 m. (b) 4·6 m. x 2·7 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Yield of seed. (iv) (a) 1963 to 65. (b) No. (v) to (vii) Nil.

5. RESULTS:
   (i) 1396 Kg./ha. (ii) (a) 584·7 Kg/ha. (b) 227·1 Kg/ha. (iii) Main effect of N is highly significt. Main 
   effects of D and P and interactions D x P and D x N x P are significant. (iv) Av. yield of seed in Kg/ha

<table>
<thead>
<tr>
<th></th>
<th>N2</th>
<th>N1</th>
<th>N3</th>
<th>P2</th>
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<td>992</td>
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<td>1005</td>
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<tr>
<td>Mean</td>
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<tr>
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<td>1558</td>
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</tr>
</tbody>
</table>

C.D. for D marginal means =44·7 Kg/ha.
C.D. for N or P marginal means =124·4 Kg/ha.
C.D. for P means at the same level of D =215·4 Kg/ha.
C.D. for D means at the same level of P =471·7 Kg/ha.

Crop :- Mustard (Rahi).
Site :- Govt. Agri. Res. Farm, Borkhera.
Ref :- Rj. 63(58).
Type :- 'IM'.

Object :- To study the effect of irrigation, fertilizers and method of application on the yield of Mustard.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Class I. (iii) 13.11.63. (iv) (a) 1 ploughing, 2 cross bulkerings and 1 
   p'anking. (b) Drilling behind the plough. (c) 7 Kg/ha. (d) 46 cm. between rows. (e) N.A. (v) 44·8 Kg/
   ha. of P2O5+44·8 Kg/ha. of K2O. (vi) R.L.-13. (vii) As per treatments. (viii) N.A. (ix) 140 cm. (x) 
   19.3.64.

2. TREATMENTS:
   Main-plot treatments :
   4 irrigation schedules : I0=No irrigation, I1=1 irrigation after one month, I2=One irrigation after 
   2 months and I3=One irrigation after one month and the 2nd after 2 months.

   Sub-plot treatments :
   All combinations of (1) and (2).
   (1) 3 levels of N : N0=0, N1=50·4 and N2=100·9 Kg/ha.
   (2) 4 methods of application of N : M1=Full dose by broadcasting, M1=Full dose by drilling,
   M3=½ dose by drilling+½ dose as top dressing after one 
   month and M4=⅓ dose by broadcasting+⅓ as top dressing 
   after one month.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 12 sub-plots/m sin-plot. (b) 46 0 m. x 12·7 m. (iii) 4. 
   (iv) (a) 3·1 m. x 2·4 m. (b) 2·4 m. x 1·8 m. (v) 30 cm. x 30 cm. (vi) Yes.
4. GENERAL:
(i) Normal: (ii) Incidence of Apricot brassica. Spraying of Nicotine sulphate fortnightly. (iii) Yield of grain. (iv) (a) 1963-contd. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 501 Kg/ha.  
(ii) (a) 54.9 Kg/ha.  
(iii) Main effect of I, N and M are highly significant and interaction M x N is significant. (iv) Av. yield of seed in Kg/ha.

<table>
<thead>
<tr>
<th>Crop: Mustard (Rabi).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site: Govt. Agri. Farm, Sriganganagar.</td>
</tr>
<tr>
<td>Ref: Rj. 63(64).</td>
</tr>
<tr>
<td>Type: ( 'I'M' ).</td>
</tr>
</tbody>
</table>

Object: To find out the suitable dose of N and optimum number of irrigations at critical stages for mustard crop.

1. BASAL CONDITIONS:
(i) (a) Nil.  
(b) Fallow.  
(c) N.A.  
(ii) Sandy loam.  
(iii) 15.10.63.  
(iv) (a) N.A.  
(b) Drilling.  
(c) 5 Kg/ha.  
(d) 30 cm. between rows.  
(e) N.A.  
(v) N.A.  
(vi) R.L. 18.  
(vii) As per treatments.  
(viii) 2 hoeings.  
(ix) N.A.  
(x) 27.3.64.

2. TREATMENTS:
Main-plot treatments:
7 irrigation schedules:
- \( I_0 = \) No irrigation, \( I_1 = \) 1 irrigation after 1½ months, \( I_2 = \) 2 irrigations, 1st after 1½ months and 2nd at flowering stage, \( I_3 = \) Irrigation at flowering stage, \( I_4 = \) 3 irrigations, 1st after 1½ months, 2nd at flowering stage and 3rd at seed formation stage, \( I_5 = \) 1 irrigation at seed formation stage and \( I_6 = \) 2 irrigations, 1st after 1½ months and 2nd at seed formation stage.

Sub-plot treatments:
3 levels of N:
- \( N_1 = 0 \), \( N_2 = 24.7 \) and \( N_3 = 49.4 \) Kg/ha.

3. DESIGN:
(s) Split-plot.  
(ii) (a) 7 main-plots/replication; 3 sub-plots/main-plot.  
(b) N.A.  
(iii) 3.  
(iv) (a) 5·5 m. x 4·6 m.  
(b) 3·7 m. x 2·8 m.  
(v) 91 cm. x 91 cm.  
(vi) Yes.

4. GENERAL:
(i) Good.  
(ii) Nil.  
(iii) Yield of seed.  
(iv) (a) 1963 to 1965.  
(b) No.  
(c) N.A.  
(v) to (vii) Nil.
5. RESULTS:

(i) 800 Kg/ha. (ii) (a) 218·0 Kg/ha. (b) 134·0 Kg/ha. (iii) Main effects of I and N are highly significant. (iv) Av. yield of seed in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>I₀</th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
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<th>I₅</th>
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<td>N₄</td>
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<td>834</td>
<td>1032</td>
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</table>

Mean 536 838 738 1045 694 877 301

C.D. for I marginal means=224·0 Kg/ha.
C.D. for N marginal means=84·6 Kg/ha.

Crop :- Mustard (Rabi).
Site :- Govt. Agri. Res. Farm, Sriganganagar.
Ref :- Rj. 64(51), 65(29).
Type :- 'IM'.

Object :- To study the effect of irrigations and levels of N on the yield of Mustard.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 27.10.64 ; 27.10.65. (iv) (a) 1 to 2 ploughings. (b) Sown in lines for 64(51); Behind the plough for other. (c) 2 Kg/ha. (d) 46 cm. x 30 cm. between lines. (e) Nil. (v) 37 Kg/ha. of P₂O₅. (vi) R.L. 18 for 64(51); Z—18 for 65(29). (vii) Irrigated. (viii) 2 hand hoeings. (ix) N.A. (x) 4.4.65 ; 24.3.66.

2. TREATMENTS:

Main-plot treatments:
8 irrigation schedule:
I₀ = No irrigation, I₁ = 1 irrigation after 45 days of sowing, I₂ = 1 irrigation at 45 days and the 2nd at flowering stage, I₃ = 1 irrigation at flowering stage, I₄ = 1 irrigation at 45 days, 2nd at flowering stage and 3rd at seed formation, I₅ = 1 irrigation at seed formation, I₆ = 1 irrigation after 45 days and 2nd at seed formation and I₇ = 1 irrigation at flowering stage + 2nd at seed formation.

Sub-plot treatments:
3 levels of N: N₀ = 0, N₁ = 24·7 and N₄ = 49·4 Kg/ha.

3. DESIGN:

(i) Split-plot. (ii) (a) 8 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 5·5 m. x 3·7 m. for 64(51) ; 5·5 m. x 5·5 m. for 65(29). (b) 4·6 m. x 2·7 m. for 64(51) ; 4·6 m. x 4·6 m. for 65(29). (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:

(i) Good. (ii) N.A. for 64(51) ; Nil for 65(29). (iii) Yield of seed. (iv) (a) 1964—1965. (b) No. (c) Nil. (v) and (vi) Nil. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS:

64(51)
(i) 1079 Kg/ha. (ii) (a) 281·0 Kg/ha. (b) 234·0 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of seed in Kg/ha.
Crop: Mustard (Rabi).
Site: Govt. Agri. Res. Farm, Borkhera.

Object: To workout a schedule for the control of Mustard pests.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) 26.11.64. (iv) (a) N.A. (b) Drilling. (c) 6·7 Kg/ha. (d) 46 cm. x 15 cm. (e) —. (v) 33·6 Kg/ha. of N+22·4 Kg/ha. of P_{2}O_{5} were applied by drilling on 26.11.64. (vi) R.L. 17. (vii) Irrigated. (viii) 1 kudali, (ix) Nil, (ix) 31.3.65.

2. TREATMENTS:
   6 fungicidal treatment : T_{0} = Control, T_{1} = 2 sprays : Spray of D.D.T.+B.H.C. 0·25% 7 days after germination, pre bloom spray of Parathio no 0·05 %, T_{2} = 3 sprays : Spray of DDT+BHC 0·25% 7 days after germination pre bloom spray of parathion 0·05%, Post bloom spray of parathion (2—3 weeks after pre bloom parathion 0·05%). T_{3} = 4 sprays : Spray of DDT+BHC 0·25% 7 days after germination spray of DDT+BHC 0·25% 15 days after 1st spray, spray of parathion 0·05% 21 days after 2nd spray, spray of parathion 0·05%15 days after 3rd spray, T_{4} = 5 sprays : Starting from 7 days up to 5th spray fortnightly intervals (3 sprays of DDT+BHC and last 3 sprays with parathion). T_{5} = 6 sprays : starting from 2 days after germination till 6th spray at fortnightly intervals (3 sprays with DDT+BHC and the last 3 sprays with parathion).

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 10·1 m. x 5·0 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good except in control plots. (ii) Attack of mustard pests. Control measure taken as per treatments. (iii) Yield of grain. (iv) (a) 1964—66. (b) No. (c) N.A. (v) to (vii) Nil.
5. RESULTS:
(i) 389 Kg/ha.  (ii) 118.2 Kg/ha.  (iii) Treatment differences are not significant.  (iv) Av. yield of seed in Kg/ha.

<table>
<thead>
<tr>
<th>Treatments</th>
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Crop: - Til (Kharif).
Site: - Govt. Agri. Farm, Mandore.

Ref: - Rj. 63(39).
Type: - ‘CV’.

Objec: - To study the effect of different seed rates, spacing and varieties on the yield of Til.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (j) Sandy loam. (iii) 10.8.63. (iv) (a) 1 discing and 2 cultivation. (b) Line sowing behind the plough. (c) and (d) As per treatments, (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 1 hand weeding. (ix) N.A. (x) 24.10.63.

2. TREATMENTS:
Main-plot treatments:
Sub-plot treatments:
All combinations of (1) and (2)
(1) 4 seed rates: R1 =2, R2 =4, R3 =7 and R4 =9 Kg/ha.
(2) 2 varieties: V1 No. 50 and V2 N.P. 6.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots replication ; 8 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (e) 5·5 m, x 3·7 m. (b) 4·6 m. x 3·1 m. (v) 46 cm. x 30 cm. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Yield of til. (iv) 1963—contd. (b) No. (c) N.A. (v) to (vii) N.A.

5. RESULTS:
(i) 378 Kg/ha.  (ii) (a) 115.0 Kg/ha.  (b) 77.6 Kg/ha.  (iii) Main effect of V alone is highly significant.  (iv) Av. yield of til in Kg/ha.

<table>
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<th>R4</th>
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</table>

C.D. for V marginal means=32·3 Kg/ha.
Crop :- Til (Kharif).

Site :- Govt. Agri. Farm, Banswara.

Ref :- Rj. 64(6).

Type :- ‘D’.

Object :—To study the relative efficacy of different fungicides in the control of Til Blight.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) 33·6 Kg/ha. of N+16·8 Kg/ha. of P2O5 as Super. (ii) Black cotton soil.
   (iii) 31·7.64. (iv) (a) 3 discings, 3 plankings and 4 bukerings. (b) Line sowing behind the plough.
   (c) N.A. (d) 30 cm. x 15 cm. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) 3 weedings and
   thinning. (ix) N.A. (x) 6.11.64.

2. TREATMENTS:
   10 fungical treatments : T0 =Control, T1 =Blitane 0·2%, T2 =Bordeaux mixture 1·0%, T3 =Dithane
   Z-780 2%, T4 =Blitox 0·25%, T5 =Crag 0·3%, T6 =Ferbam 0·2%, T7 =Colloidal
   copper 0·2%, T8 =Tamraghar 0·25% and T9 =Fytolan 0·25%.
   First spray is given to 3 weeks old plants, and subsequent sprays at an interval of 20 days till the maturity
   of the crop.

3. DESIGN:
   (i) Incomplete L. Sq. (ii) (a) 3 plots/block; 10 blocks/sq.; and 3 sqs. (b) 30·2 m. x 12·2 m. (iii) 9.
   (iv) (a) and (b) 3·7 m. x 2·7 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) Incidence of seamsum blight; control measures as per treatments. (iii) Yield of til and no. of
   diseased plants/plot. (iv) (a) 1964 only. (b) No, (c) Nil. (v) and (vi) N.A. (vii) Nil.

5. RESULTS:
   (i) 71·7 Kg/ha. (ii) 25·0 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of seamsum
   in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>T9</th>
<th>Av. yield</th>
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<tr>
<td></td>
<td>76·9</td>
<td>74·2</td>
<td>72·6</td>
<td>61·5</td>
<td>69·7</td>
<td>82·0</td>
<td>49·8</td>
<td>85·0</td>
<td>74·4</td>
<td>70·5</td>
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Crop :- Castor (Kharif).

Site :- Govt. Agri. Res. Farm, Sriganganagar.

Ref :- Rj. 64(23).

Type :- ‘CM’.

Object :—To study the effect of different levels of N, P and K and spacings on the yield of Castor.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Barley. (c) N.A. (ii) Sandy loam. (iii) 21.7.64. (iv) (a) Field preparation with desi
   plough. (b) N.A. (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) HC 6. (vii) Irrigated.
   (viii) Weeding by hand hoe. (ix) N.A. (x) 2.3.65.

2. TREATMENTS:
   Main-plot treatments :
   3 spacings : S1=91 cm. x 30 cm., S2=91 cm. x 61 cm. and S3=91 cm. x 91 cm.
   Sub-plot treatments : All combinations of (1), (2) and (3)

   (1) 3 levels of N : N0=0, N1=18·5 and N2=37·1 Kg/ha.
   (2) 2 levels of P2O5 : P0=0 and P1=37·1 Kg/ha.
   (3) 2 levels of K2O : K0=0 and K1=37·1 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/replication, 12 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) N.A.
   (b) 7·3 m. x 5·5 m. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Yield of castor. (iv) (a) 1963 only. (b) No. (c) N.A. (v) and (vi) N.A.
   (vii) Nil.
5. RESULTS:
(i) 117·5 Kg/ha, (ii) 94·8 Kg/ha. (b) 51·7 Kg/ha. (iii) Main effect of N alone is significant. (iv) Av. yield of castor in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Π₁</th>
<th>Π₂</th>
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<td>105</td>
<td>96</td>
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<td>K₉</td>
<td>136</td>
<td>117</td>
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<td>125</td>
<td>130</td>
<td>116</td>
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</tbody>
</table>

C.D. for N marginal mean = 24·4 Kg/ha.

Crop :- Castor (Kharif).

Site :- Govt. Agri. College Farm, Jobner.

Object :- To find out the foxyly of different insecticides on castor hairy caterpillar.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) N.A. (iv) (a) Nil. (b) Dibbling. (c) 24 seeds/plot. (d) 91 cm. x 91 cm. (e) N.A. (f) Nil. (vi) Local. (vii) Unirrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS:
8 insecticidal treatments: T₀ = Control, T₁ = D.D.T.W./P. 0·25%, T₂ = Endrin E.C. 0·02%, T₃ = Diazinon E.C. 0·02%, T₄ = Parathion E.C. 0·03%, T₅ = Sevin W.P. 0·1%, T₆ = Gusathion W.P. 0·1% and T₇ = Malathion E.C. 0·1%.

3. DESIGN:
(i) R.B.D. (ii) 8. (b) N.A. (iii) 3. (iv) (a) and (b) 6·1 m. x 2·4 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Attack of hairy caterpillar on castor; control measures as per treatments. (iii) Population of evprochis before spraying and 3 days after spraying. (iv) (a) 1962 only. (b) No. (c) N.A. (v) (a) Massuria. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 61·16 degrees. (ii) 4·28 degrees. (iii) Treatment differences are highly significant. (iv) Av. % of mortality in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
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<tr>
<td>Av. % of mortality in degrees</td>
<td>12·92</td>
<td>59·18</td>
<td>61·63</td>
<td>64·14</td>
<td>83·17</td>
<td>74·67</td>
<td>69·08</td>
<td>64·47</td>
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<td>C.D. = 7·49 degrees</td>
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</table>
Crop: Linseed (Rabi).

Site: Govt. Agri. Res. Farm, Borkhera.

Ref: Rj. 60(42), 61(51).

Type: ‘M’.

Object: To study the effect of different levels of P along with different levels and sources of N on the yield of Linseed.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Nil for 60(42); Groundnut for 61(51). (c) Nil. (ii) Clay loam. (iii) 13.10.60; 26.10.61. (iv) (a) One ploughing for 60(42); N.A. for other. (b) N.A. (c) 23 Kg/ha. (d) 30 cm x 23 cm. (e) N.A. (v) N.A. (vi) Local. (vii) Unirrigated. (viii) Weeding and hoeing for 60(42); N.A. for other. (ix) N.A. (x) N.A.; 14 and 23.3.62.

2. TREATMENTS:
   All combinations of (1), (2) and (3)+3 extra treatments.
   (1) 3 sources of N: S1=A/S, S2=A/S/N and S3=Urea.
   (2) 2 levels of N: N1=33.6 and N2=33.6 Kg/ha.
   (3) 3 levels of P2O5 as Super: P0=0, P1=16.8 and P2=33.6 Kg/ha.
   Extra treatments are: E0=0, E1=16.8 and E2=33.6 Kg/ha. of P2O5 as Super.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 21. (b) N.A. (iii) 2. (iv) (a) 9.2 m x 5.5 m. (b) 7.4 m x 3.7 m. (v) 91 cm x 91 cm. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. for 60(42); Nil for other. (iii) Yield of seed. (iv) (a) 1960–1961. (b) N.A. (c) Results of combined analysis given under 5. Results (v) and (vi) N.A. (vii) Error variances are homogeneous and Treatments x years interaction is absent.

5. RESULTS:
   (i) 456 Kg/ha. (ii) 129.6 Kg/ha, (based on 100 d.f. made up of Treatments x years interaction and pooled error). (iii) Main effect of N alone is significant. (iv) Av. yield of seed in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>P0</th>
<th>P1</th>
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<td>473</td>
<td>447</td>
<td>481</td>
<td>466</td>
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<td>432</td>
<td>459</td>
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<td></td>
</tr>
<tr>
<td>P1</td>
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<td>544</td>
<td>467</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>P2</td>
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<td>468</td>
<td>493</td>
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</tbody>
</table>

C.D. for N marginal means = 49.5 Kg/ha.
1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Fallow. (c) No. (ii) Clay loam. (iii) 22.10.61; 15.10.1962. (iv) (a) 1 ploughing and 2 discings. (b) Drilling. (c) 17 to 25 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) N.A. (vi) R.R. 45. (vii) Unirrigated. (viii) and (ix) N.A. (x) N.A. for 61(102); 21.3.1963.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N_0=0, N_1=33.6 and N_2=67.2 Kg/ha.
   (2) 3 levels of P: P_0=0, P_1=33.6 and P_2=67.2 Kg/ha.
   (3) 3 levels of K: K_0=0, K_1=33.6 and K_2=67.2 Kg/ha.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) 6'1 m. x 3'1 m. for 61(102); N.A. for 62(62). (b) 5'5 m. x 2'4 m. (v) 30 em. x 30 cm. (vi) Yes.

4. GENERAL:
   (i) N.A. for 61(102); Good for 62(62). (ii) Nil. (iii) Yield of seed. (iv) (a) 1961 to 1962. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) Since the error variances are heterogeneous and Treatments x years interaction is absent, results of individual years are presented under 5. Results.

5. RESULTS:
   61(102)
   (i) 607 Kg/ha. (ii) 153.4 Kg/ha. (iii) Main effects of N and P are highly significant. (iv) Av. yield of seed in Kg/ha.

<table>
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<tr>
<th></th>
<th>P_0</th>
<th>P_1</th>
<th>P_2</th>
<th>K_0</th>
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<th>K_2</th>
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<td>607</td>
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<td>K_2</td>
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<td>688</td>
<td>688</td>
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</tr>
</tbody>
</table>

C.D. for N or P marginal means = 71.7 Kg/ha.

62(62)
   (i) 690 Kg/ha. (ii) 246.7 Kg/ha. (iii) Main effects of N and P are highly significant. Interaction N x P x K is significant. (iv) Av. yield of seed in Kg/ha.

<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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</table>

C.D. for N or P marginal means = 115.1 Kg/ha.
Crop :- Linseed (Rabi).
Site :- Govt. Agri. Res. Farm, Bokhera.
Object :- To study the effect of different trace elements under different fertility levels on the yield of Linseed.

Ref :- Rj. 62(89).
Type :- ‘M’.

BASAL CONDITIONS :

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 5.11.62. (iv) (a) 1 bakhering with Bakhar, 2 plankings with pata and 1 harrowing with disc harrow. (b) Drilling. (c) 27.7 Kgha. (d) 30 cm. between lines. (e) N.A. (v) Nil. (vi) R.R. 45. (vii) Irrigated. (viii) Nil. (ix) Negligible. (x) 3.3.63.

2. TREATMENTS :

Main-plot treatments :

2 methods of application : A₁ = Basal at sowing and A₂ = Sprays after 2 months.

Sub-plot treatments :

4 fertility levels : F₀ = Control, F₁ = 22.4 Kg/ha. of N + 22.4 Kg/ha. of P + 22.4 Kg/ha. of K, F₂ = Twice F₁ and F₃ = 3 times F₁.

Sub-sub-plot treatments :

9 trace elements treatments : T₀ = Control, T₁ = Cu, T₂ = Fe, T₃ = Zn, T₄ = Mg, T₅ = BO, T₆ = DO, T₇ = Mn and T₈ = Sulphur.

All trace elements were applied at 11.2 Kgha.

3. DESIGN :

(i) Split-plot. (ii) (a) 9 main-plots/replication; 4 sub-plots/main-plot, 9 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) 3.1 m. x 2.4 m. (b) 2.4 m. x 1.8 m. (v) Nil. (vi) Yes.

4. GENERAL :

(i) Normal. (ii) Nil. (iii) Yield of seed. (iv) (a) 1962 – N.A. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS :

(i) 823 Kgha. (ii) (a) 199.4 Kg/ha. (b) 148.7 Kg/ha. (c) 192.8 Kg/ha. (iii) Main effect of F alone is significant. (iv) Av. yield of seed in Kgha.

<table>
<thead>
<tr>
<th></th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>T₇</th>
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</table>

C.D. for F marginal means = 85.6 Kgha.

Crop :- Linseed (Rabi); Ref :- Rj. 63(44).
Site :- Govt. Agri. Res. Farm, Sultanpur.
Object :- To find out a suitable method of application and manurial requirement for Linseed.

Type :- ‘M’.
1. **BASAL CONDITIONS**:

(i) (a) Nil. (b) and (c) N.A. (ii) Class II. (iii) 23.10.63. (iv) (a) 1 ploughing and 1 bakhiring. (b) Drilling. (c) 27-7 Kg/ha. (d) Between lines 30 cm. (e) N.A. (f) N.A. (vi) R.R. 45. (vii) Unirrigated. (viii) 1 weeding and hoeing. (ix) N.A. (x) 30.3.64.

2. **TREATMENTS**:

**Main-plot treatments**:

- 3 manurial treatments: $M_1 = 16.8$ Kg/ha of N+16.8 Kg/ha of P, $M_2 = 2$ times $M_1$, and $M_3 = 3$ times $M_1$.

**Sub-plot treatments**:

10 methods of application:
- $T_1 = $ Full dose at sowing by broadcasting.
- $T_2 = $ Full dose at sowing by drilling.
- $T_3 = $ Sowing by drilling+$\frac{1}{2}$ as top dressing, $T_4 = $ at sowing by drilling+$\frac{1}{4}$ as top dressing, $T_5 = $ at sowing by broadcasting+$\frac{1}{4}$ as top dressing, $T_6 = $ at sowing by broadcasting+$\frac{1}{2}$ as top dressing, and $T_7 = $ at sowing by broadcasting+$\frac{3}{4}$ as top dressing.

3. **DESIGN**:

(i) Split-plot. (ii) (a) 3 main-plots/replication, 10 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 3.7 m. $\times$ 3.1 m. (b) 3.1 m. $\times$ 2.4 m. (b) 3.1 m. $\times$ 2.4 m. (v) 30 cm. $\times$ 30 cm. (vi) Yes.

4. **GENERAL**:

(i) Normal. (ii) Nil. (iii) Yield of seed. (iv) (c) 1963—N.A. (b) No. (c) N.A. (v) to (vii) N.A.

5. **RESULTS**:

(i) 758 Kg/ha. (ii) (a) 48.6 Kg/ha. (b) 46.6 Kg/ha. (iii) Main effect of M is highly significant and main effect of T and interaction T x M are significant. (iv) Av. yield of seed in Kg/ha.

<table>
<thead>
<tr>
<th>M_1</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
<th>T_7</th>
<th>T_8</th>
<th>T_9</th>
<th>T_10</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>491</td>
<td>605</td>
<td>572</td>
<td>703</td>
<td>609</td>
<td>651</td>
<td>658</td>
<td>725</td>
<td>674</td>
<td>769</td>
<td>646</td>
<td></td>
</tr>
<tr>
<td>700</td>
<td>743</td>
<td>760</td>
<td>774</td>
<td>758</td>
<td>800</td>
<td>821</td>
<td>868</td>
<td>928</td>
<td>1009</td>
<td>816</td>
<td></td>
</tr>
<tr>
<td>656</td>
<td>757</td>
<td>733</td>
<td>854</td>
<td>693</td>
<td>794</td>
<td>863</td>
<td>912</td>
<td>896</td>
<td>959</td>
<td>812</td>
<td></td>
</tr>
</tbody>
</table>

| Mean | 616 | 702 | 688 | 777 | 687 | 748 | 781 | 835 | 833 | 912 | 758 |

C.D. for M marginal means = 26.7 Kg/ha.
C.D. for T marginal means = 37.9 Kg/ha.
C.D. for T means at the same level of M = 65.8 Kg/ha.
C.D. for M means at the same level of T = 67.4 Kg/ha.

---

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

**Site :- Mech. Farm, Ummegundj.**

Object — To study the effect of different trace elements under different fertility levels on the yield of Linseed.

1. **BASAL CONDITIONS**:

(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Class II. (iii) 20.10.63. (iv) (a) 2 cross discings and 1 planking. (b) Drilling. (c) 23 Kg/ha. (d) Between lines 30 cm. (e) N.A. (f) N.A. (vi) R.R. 45. (vii) Irrigated. (vii) Nil. (ix) N.A. (x) 8.4 64.
2. TREATMENTS:

Main-plot treatments:
2 times of application: A1 = At sowing and A2 = Spraying after 2 months.

Sub-plot treatments:
4 manurial treatments: M0 = Control, M1 = 22.4 Kg/ha. of N + 22.4 Kg/ha. of P2O5 + 22.4 Kg/ha. of K2O
M2 = 44.8 Kg/ha. of N + 44.8 Kg/ha. of P2O5 + 44.8 Kg/ha. of K2O and M3 = 67.2 Kg/ha. of N + 67.2 Kg/ha. of P2O5 + 67.2 Kg/ha. of K2O.

Sub-sub-plot treatments:
9 trace elements: T0 = Control, T1 = Cu, T2 = Fe, T3 = Zn, T4 = Mg, T5 = B, T6 = Mn and T7 = Sulphur.

All trace elements were applied at 1.12 Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/replication, 4 sub-plots/main-plot, 9 sub-sub-plots/sub-plots. (b) N.A.
(iii) 2. (iv) (a) 3.1 m. x 2.4 m. (b) 2.4 m. x 1.8 m. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of seed. (iv) (a) 1962—contd. (b) No. (c) N.A. (v) (a) Borkhera. (b) N.A. (vi) Nil. (vii) N.A.

5. RESULTS:
(i) 729 Kg/ha. (ii) (a) 50 Kg/ha. (b) 108.9 Kg/ha. (c) 58.5 Kg/ha. (iii) Main effects of A, M and T are highly significant. Interactions A x M, M x T and A x M x T are significant. (iv) Av. yield of seed in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
<th>T8</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>594</td>
<td>1034</td>
<td>767</td>
<td>765</td>
<td>650</td>
<td>883</td>
<td>619</td>
<td>750</td>
<td>636</td>
</tr>
<tr>
<td>A2</td>
<td>547</td>
<td>940</td>
<td>708</td>
<td>771</td>
<td>600</td>
<td>894</td>
<td>597</td>
<td>722</td>
<td>646</td>
</tr>
<tr>
<td>Mean</td>
<td>570</td>
<td>987</td>
<td>738</td>
<td>768</td>
<td>625</td>
<td>888</td>
<td>608</td>
<td>736</td>
<td>641</td>
</tr>
<tr>
<td>M0</td>
<td>448</td>
<td>768</td>
<td>535</td>
<td>527</td>
<td>443</td>
<td>614</td>
<td>404</td>
<td>502</td>
<td>493</td>
</tr>
<tr>
<td>M1</td>
<td>936</td>
<td>1057</td>
<td>818</td>
<td>869</td>
<td>723</td>
<td>959</td>
<td>762</td>
<td>827</td>
<td>729</td>
</tr>
<tr>
<td>M2</td>
<td>701</td>
<td>1127</td>
<td>844</td>
<td>846</td>
<td>762</td>
<td>1012</td>
<td>706</td>
<td>875</td>
<td>760</td>
</tr>
<tr>
<td>M3</td>
<td>533</td>
<td>998</td>
<td>751</td>
<td>830</td>
<td>572</td>
<td>970</td>
<td>561</td>
<td>740</td>
<td>583</td>
</tr>
</tbody>
</table>

C.D. for A marginal means = 10.2 Kg/ha.
C.D. for M marginal means = 62.9 Kg/ha.
C.D. for T marginal means = 41.4 Kg/ha.
C.D. for M means at the same level of A = 88.8 Kg/ha.
C.D. for A means at the same level of M = 77.1 Kg/ha.
C.D. for M means at the same level of T = 99.6 Kg/ha.
C.D. for T means at the same level of M = 82.5 Kg/ha.

Crop : Linseed.  Ref : Rj. 63(S.F.T.)
Site : (District). Kota.  Type : 'M'.

Object :—To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients (Type : A1).

1. BASAL CONDITIONS:
(i) N.A. (ii) Red and black. (iii) to (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.
2. TREATMENTS:

8 manurial treatments:

O  = Control (no manure)
N1 = 33·6 Kg/ha. of N
N2 = 67·2 Kg/ha. of N
P1 = 16·8 Kg/ha. of P2O5
N1P1 = 33·6 Kg/ha. of N + 16·8 Kg/ha. of P2O5
N2P1 = 67·2 Kg/ha. of N + 16·8 Kg/ha. of P2O5
N1P2 = 67·2 Kg/ha. of N + 33·6 Kg/ha. of P2O5
N1P2K1 = 67·2 Kg/ha. of N + 33·6 Kg/ha. of P2O5 + 16·8 Kg/ha. of K2O

N applied as A/S, P2O5 as Super and K2O as Mur. Pot.

3. DESIGN:

A selected district is divided into four agriculturally-homogeneous zones based on climate, soil, cropping pattern etc. In each zone one block is selected at random. A block normally consists of a group of 50—100 villages. In each block 36 experiments are conducted in a year of which 11 are of type A1, 11 of type A2, 11 of type A3 and 3 are of type C. The eleven experiments under type A1, A2 and A3 are distributed as 3 on a kharif cereal, 3 on a rabi cereal, 3 on a cash crop and 2 on oil seed. All the three type—C experiments are conducted on a legume crop. For the purpose of conducting the A1, A2 and A3 experiments 11 villages are randomly selected in each block and in each village 3 experiments one each of type A1, A2 and A3 are laid out. For conducting the three type—C trials three villages are randomly selected in each block.

4. GENERAL:

(i) to (iii) N.A., (iv) (a) 1962 to 1966 [1964 and 1965 N.A.] (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N1P2K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of linseed in Kg/ha.</td>
<td>97</td>
<td>231</td>
<td>37</td>
<td>146</td>
<td>251</td>
<td>329</td>
<td>376</td>
<td>40·1</td>
</tr>
</tbody>
</table>

Control yield = 303 Kg/ha.; No. of trials = 7.

Crop :- Linseed.  
Ref :- Rj. 62, 64, 65(S.F.T.)

Site :- (District) : Kota.  
Type :- 'M'.

Object :- To study the response curves of important cereal, cash and oilseed crops to nitrogen applied singly and in combination with other nutrients (Type : A1).

1. BASAL CONDITIONS:

(i) N.A. (ii) Red and black. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

8 manurial treatments:

O = Control (no manure).
N1 = 22·4 Kg/ha. of N
N2 = 44·8 Kg/ha. of N
P1 = 11·2 Kg/ha. of P2O5
N1P1 = 22·4 Kg/ha. of N + 11·2 Kg/ha. of P2O5
N2P1 = 44·8 Kg/ha. of N + 11·2 Kg/ha. of P2O5
N1P2 = 44·8 Kg/ha. of N + 22·4 Kg/ha. of P2O5
N1P2K1 = 44·8 Kg/ha. of N + 22·4 Kg/ha. of P2O5 + 11·2 Kg/ha. K2O.

N applied as A/S, P2O5 as Super and K2O as Mur. of Pot.

3. DESIGN:

Same as in type A1 (Irrigated) on page 347.
4. GENERAL:
(i) to (iii) N.A.  (iv) (a) 1962 to 1966 [1963—N.A.].  (b) and (c) N.A.  (v) to (vii) N.A.

5. RESULTS:

62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>N1P1K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linseed in Kg/ha.</td>
<td>-137</td>
<td>-95</td>
<td>-160</td>
<td>-45</td>
<td>-21</td>
<td>65</td>
<td>34</td>
<td>148.4</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 470 Kg/ha.; No. of trials = 7.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>N1P2K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linseed in Kg/ha.</td>
<td>92</td>
<td>171</td>
<td>83</td>
<td>145</td>
<td>199</td>
<td>325</td>
<td>657</td>
<td>216.7</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 248 Kg/ha.; No. of trials = 7.

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>N2</th>
<th>P1</th>
<th>N1P1</th>
<th>N2P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>N1P1K2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>linseed in Kg/ha.</td>
<td>78</td>
<td>88</td>
<td>61</td>
<td>97</td>
<td>176</td>
<td>182</td>
<td>246</td>
<td>9.4</td>
<td></td>
</tr>
</tbody>
</table>

Control yield = 218 Kg/ha.; No. of trials = 6.

Object:—To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients (Type: A2).

1. BASAL CONDITIONS:
(i) N.A.  (ii) Red and black.  (iii) to (vi) N.A.  (vii) Irrigated.  (viii) to (x) N.A.

2. TREATMENTS:

8 manurial treatments

O = Control (no manure).

N1 = 33.6 Kg/ha. of N1.
P1 = 16.8 Kg/ha. of P1O3.
P2 = 33.6 Kg/ha. of P2O5.
N1P1 = 33.6 Kg/ha. of N + 16.8 Kg/ha. of P1O3.
N1P2 = 33.6 Kg/ha. of N + 33.6 Kg/ha. of P2O5.
N2P2 = 67.2 Kg/ha. of N + 33.6 Kg/ha. of K2O.
N1P1K2 = 67.2 Kg/ha. of N + 33.6 Kg/ha. of P1O3 + 33.6 Kg/ha. of K2O.

N applied as A/S, P2O5 as Super and K2O as Mur. of Pot.

3. DESIGN:

Same as in type A1 (Irrigated) on page 347.

4. GENERAL:
(i) to (iii) N.A.  (iv) (a) 1962 to 1966 [1964—N.A.].  (b) and (c) N.A.  (v) to (vii) N.A.
5. RESULTS:

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatments</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&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;2&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of</td>
<td>120</td>
<td>20</td>
<td>71</td>
<td>165</td>
<td>117</td>
<td>225</td>
<td>347</td>
</tr>
<tr>
<td>Linseed in Kg/ha.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control yield=360 Kg/ha.; No. of trials=6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatments</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&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;2&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of</td>
<td>55</td>
<td>92</td>
<td>85</td>
<td>85</td>
<td>170</td>
<td>157</td>
<td>282</td>
</tr>
<tr>
<td>Linseed in Kg/ha.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control yield=300 Kg/ha.; No. of trials=7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Object:—To study response curve of important cereal, cash and oilseed crops to phosphorus singly and in combination with other nutrients. (Type : A<sub>1</sub>).

1. BASAL CONDITIONS:
   (i) N.A. (ii) Red and black. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

   8 manurial treatments:
   O =Control (no manure).
   N<sub>1</sub> = 22.4 Kg/ha. of N.
   P<sub>1</sub> = 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.
   N<sub>1</sub>P<sub>1</sub> = 22.4 Kg/ha. of N + 11.2 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.
   N<sub>1</sub>P<sub>2</sub> = 44.8 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub>.
   N<sub>1</sub>P<sub>1</sub>K<sub>1</sub> = 44.8 Kg/ha. of N + 22.4 Kg/ha. of P<sub>2</sub>O<sub>5</sub> + 22.4 Kg/ha. of K<sub>2</sub>O.
   N applied as A/S, P<sub>2</sub>O<sub>5</sub> as Super and K<sub>2</sub>O s Mur. Pot.

3. DESIGN:

   Same as in (i) pe A, (Irrigated) on page 347.

4. GENERAL:

   (i) to (iii) N.A. (iv) (a) 1962 to 1965 (1963 N.A.). (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&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;2&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of</td>
<td>147</td>
<td>49</td>
<td>67</td>
<td>136</td>
<td>238</td>
<td>253</td>
<td>327</td>
</tr>
<tr>
<td>Linseed in Kg/ha.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control yield=239 Kg/ha.; No. of trials=6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&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;2&lt;/sub&gt;K&lt;sub&gt;1&lt;/sub&gt;</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of</td>
<td>69</td>
<td>48</td>
<td>41</td>
<td>107</td>
<td>131</td>
<td>138</td>
<td>165</td>
</tr>
<tr>
<td>Linseed in Kg/ha.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control yield=263 Kg/ha.; No. of trials=7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Linseed. 
Site: (District): Kota.

Object: To study response curves of important cereal, cash and oilseed crops to potash applied singly and in combination with other nutrients (Type: A3).

1. BASAL CONDITIONS:

2. TREATMENTS:
   8 manurial treatment:
   (i) O =Control (no manure):
   (ii) N1 =33'6 Kg/ha. of N.
   (iii) K1 =16'8 Kg/ha. of K2O.
   (iv) N1K1 =33'6 Kg/ha. of N+16'8 Kg/ha. of K2O.
   (v) N1K2 =33'6 Kg/ha. of N+33'6 Kg/ha. of K2O.
   (vi) N1P1K1 =33'6 Kg/ha. of N+16'8 Kg/ha. of P2O5+16'8 Kg/ha. of K2O.
   N applied as A/S, P2O5 as Super and K2O as Mur. Pot.

3. DESIGN:
   Same as in type A1 (Irrigated) on page 347.

4. GENERAL:
   (i) to (iii) N.A. (iv) (a) 1962 to 1966 (1963 N.A.). (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N2K2</th>
<th>N1P1K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>104</td>
<td>39</td>
<td>78</td>
<td>135</td>
<td>169</td>
<td>253</td>
<td>220</td>
<td>27'1</td>
</tr>
</tbody>
</table>

Control yield = 290 Kg/ha.; No. of trials = 7.

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>N1K2</th>
<th>N2K2</th>
<th>N1P1K2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of grain in Kg/ha.</td>
<td>45</td>
<td>35</td>
<td>20</td>
<td>115</td>
<td>157</td>
<td>155</td>
<td>200</td>
<td>38'9</td>
</tr>
</tbody>
</table>

Control yield = 360 Kg/ha.; No. of trials = 3.
1. **BASAL CONDITIONS:**
   (i) N.A. (ii) Red and black. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS:**
   8 manurial treatments:
   - O = Control (no manure).
   - N₁ = 22.4 Kg/ha. of N.
   - K₁ = 11.2 Kg/ha. of K₂O.
   - K₂ = 22.4 Kg/ha. of K₂O.
   - N₁K₁ = 22.4 Kg/ha. of N + 11.2 Kg/ha. of K₂O.
   - N₁K₂ = 22.4 Kg/ha. of N + 22.4 Kg/ha. of K₂O.
   - N₂K₁ = 44.8 Kg/ha. of N + 22.4 Kg/ha. of K₂O.
   - N₂K₂ = 22.4 Kg/ha. of N + 11.2 Kg/ha. of P₂O₅ + 11.2 Kg/ha. of K₂O.
   - N applied as A/S, P₂O₅ as Super and K₂O as Mur. Pot.

3. **DESIGN:**
   Same as in type A₁ (Irrigated) on page 347.

4. **GENERAL:**
   (i) to (iii) N.A. (iv) (a) 1962 to 1965 (1963 N.A.). (b) and (c) N.A. (v) to (vii) N.A.

5. **RESULTS:**
   62 (S.F.T.)
<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₂K₂</th>
<th>N₂P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of oilseed in Kg/ha.</td>
<td>88</td>
<td>254</td>
<td>105</td>
<td>94</td>
<td>141</td>
<td>193</td>
<td>184</td>
<td>277</td>
</tr>
<tr>
<td>Control yield = 249 Kg/ha.; No. of trials = 5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

64 (S.F.T.)
<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₂K₂</th>
<th>N₂P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of oilseed in Kg/ha.</td>
<td>66</td>
<td>62</td>
<td>64</td>
<td>98</td>
<td>118</td>
<td>191</td>
<td>182</td>
<td>38.5</td>
</tr>
<tr>
<td>Control yield = 247 Kg/ha.; No. of trials = 7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Crop:** Linseed.  
**Site:** (District) Kota.  
**Ref:** Rj. 60(S.F.T.).  
**Type:** 'M'.

Object: To study the response of Linseed to levels of N, P and K applied individually and in combinations, (Type: A).

1. **BASAL CONDITIONS:**
   (i) N.A. (ii) Medium black. (iii) to (x) N.A.
3. **DESIGN:**
(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year: 8 on kharif cereal, 8 on a rabi cereal, 8 on cash crop, 4 on an oilseed crop, and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of Type C. Residual effects of phosphate application are studied on Type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/98.8 ha. (b) 1/197.7 ha. (iv) Yes.

4. **GENERAL:**
(i) to (vii) N.A.

5. **RESULTS:**

<table>
<thead>
<tr>
<th>Effects</th>
<th>N</th>
<th>P</th>
<th>K</th>
<th>S.E.</th>
<th>NP</th>
<th>NK</th>
<th>PK</th>
<th>NPK</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield of Linseed in Kg/ha. 60</td>
<td>60</td>
<td>60</td>
<td>30</td>
<td>14.0</td>
<td>0</td>
<td>-10</td>
<td>10</td>
<td>10</td>
<td>15.0</td>
</tr>
</tbody>
</table>

Control yield = 290 Kg/ha.; No. of trials = 4.

**Crop:** Linseed.  
**Ref:** Rj. 60(S.F.T.).  
**Site:** (District) Kota.  
**Type:** 'M'.

Object:—To investigate the relative efficiency of different nitrogenuous fertilizers at different doses (Type: B).

1. **BASAL CONDITIONS:**
(i) N.A. (ii) Medium black. (iii) to (x) N.A.

2. **TREATMENTS:**

| 0 = Control (no manure), n1 = 22.4 Kg/ha. of N as A/S, n2 = 44.8 Kg/ha. of N as A/S, n1' = 22.4 Kg/ha. of N as Urea, n2' = 44.8 Kg/ha. of N as Urea, n1'' = 22.4 Kg/ha. of N as C/A/N, n2'' = 44.8 Kg/ha. of N as C/A/N. |

3. **DESIGN:**
Same as in type A.

4. **GENERAL:**
(i) to (vii) N.A.

5. **RESULTS:**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>O</th>
<th>n1</th>
<th>n2</th>
<th>n1'</th>
<th>n2'</th>
<th>n1''</th>
<th>n2''</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield of Linseed in Kg/ha. 350</td>
<td>350</td>
<td>400</td>
<td>490</td>
<td>410</td>
<td>490</td>
<td>460</td>
<td>520</td>
<td>20.5</td>
</tr>
</tbody>
</table>

G.M. = 446 Kg/ha.; No. of trials = 5.
Crop :- Linseed (Rabi).
Site :- Govt. Agri. Res. Farm, Borkher.

Object :- To find out a suitable spacing and seed rate for Linseed.

1. BASAL CONDITIONS:
   (i) (a) Gram-Jowar-Linseed-Fallow. (b) Jowar. (c) Nil. (ii) Clay loam. (iii) 21.10.62. (iv) (a) One ploughing and two bakherings. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) R.R.-45. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 7.3.63.

2. TREATMENTS:
   Main-plot treatments:
   2 spacings between rows: \( S_1 = 30 \text{ cm.} \) and \( S_2 = 46 \text{ cm.} \)
   Sub-plot treatments:
   6 seed rates: \( R_1 = 15, R_2 = 25, R_3 = 35, R_4 = 45, R_5 = 54 \) and \( R_6 = 64 \) Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 3'7 m x 2'4 m. (b) 3'1 m x 1'8 m. (v) 30 cm x 30 cm. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of seed. (iv) to (vii) N.A.

5. RESULTS:
   (i) 946 Kg/ha. (ii) (a) 243'.1 Kg/ha. (b) 290'.4 Kg/ha. (iii) None of the effects is significant. (iv) Av. yield of seed in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>( R_1 )</th>
<th>( R_2 )</th>
<th>( R_3 )</th>
<th>( R_4 )</th>
<th>( R_5 )</th>
<th>( R_6 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>762</td>
<td>1009</td>
<td>1197</td>
<td>1078</td>
<td>993</td>
<td>962</td>
<td>1000</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>628</td>
<td>785</td>
<td>964</td>
<td>1031</td>
<td>975</td>
<td>973</td>
<td>893</td>
</tr>
<tr>
<td>Mean</td>
<td>695</td>
<td>897</td>
<td>1080</td>
<td>1054</td>
<td>984</td>
<td>967</td>
<td>946</td>
</tr>
</tbody>
</table>

Crop :- Linseed (Rabi).
Site :- Govt. Agri. Res. Farm, Sultanpur.

Object :– To find out a suitable seed rate and spacing for Linseed.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) N.A. (iii) 20.10.1963 ; 19.10.1965. (iv) (a) One ploughing and 2 bakherings for 63 (42), Bakhering for 65 (35). (b) Drilling. (c) and (d) As per treatments. (e) N.A. (v) 22'.4 Kg/ha. of N broadcast. (vi) R.R. 45 for 63 (42); Local als for 65 (35). (vii) Unirrigated for 63 (42); Irrigated for 65 (35). (viii) One hoeing for 63 (42); Nil for 65 (35). (ix) N.A. (x) 21.3.64, 27.4.66.

2. TREATMENTS:
   Main-plot treatments:
   2 spacings between rows: \( S_1 = 30 \text{ cm.} \) and \( S_2 = 46 \text{ cm.} \)
   Sub-plot treatments:
   6 seed rates: \( R_1 = 14'.8, R_2 = 24'.7, R_3 = 34'.6, R_4 = 44'.5, R_5 = 54'.4 \) and \( R_6 = 64'.2 \) Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/replication; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 3'7 m. x 2'4 m. (b) 3'1 m. x 1'8 m. (v) 30 cm. x 30 cm. (vi) Yes.
4. GENERAL:
(c) Results of combined analysis given under 5. (v) N.A. (vi) Nil. (vii) Both the error variances are homogene­
ous, and main-plot Treatments x years interactions is absent while sub-plot Treatments x years interac­tion is present.

5. RESULTS:
(i) 797 Kg/ha. (ii) (a) 349·8 Kg/ha. (based on 7 d.f. made up of Treatments x years interaction and pooled
error). (b) 358·8 Kg/ha. (based on 10 d.f. made up of various components of treatments with years). (iii)
None of the effects is significant. (iv) Av. yield of linseed in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>R_1</th>
<th>R_4</th>
<th>R_3</th>
<th>R_1</th>
<th>R_4</th>
<th>R_4</th>
</tr>
</thead>
<tbody>
<tr>
<td>S_1</td>
<td>596</td>
<td>930</td>
<td>1000</td>
<td>967</td>
<td>792</td>
<td>771</td>
</tr>
<tr>
<td>S_2</td>
<td>651</td>
<td>782</td>
<td>796</td>
<td>932</td>
<td>722</td>
<td>628</td>
</tr>
<tr>
<td>Mean</td>
<td>624</td>
<td>856</td>
<td>898</td>
<td>950</td>
<td>757</td>
<td>699</td>
</tr>
</tbody>
</table>

Ref:— Rj.-62(90), 63(52), 64(65).
Type:— ‘IMV’.

Crop:— Linseed (Rabi).
Site:— Govt. Agri. Res. Farm, Bokhara.
Object:— To find out the suitable variety under different irrigation and fertility levels for Linseed.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Clay loam. (iii) 18.10.62; 18.10.63; 25.11.64. (iv) (a) 1 bakhering, discing and planking for 62 (90); 2 bakhering and ploughings for 63 (52); 1 ploughings, cross tillering and planking for 64 (65). (b) Drilling (c) 28 Kg/ha. (d) 30 cm. between rows. (e) N.A. (v) Nil for 62 (90); 64 (65); N.A. for 63 (52). (vi) 5 treatments. (vii) Irrigated. (viii) Nil. (ix) Nil for 62 (90), 64 (65); N.A. for 63 (52). (x) 25.3.63; 21.3.64; 22.4.65.

2. TREATMENTS:
Main-plot treatments:
4 irrigational treatments: I_0=N irrigation, I_1=1 irrigation after a month, I_2=1 irrigation after 2 months and I_3=One irrigation after a month+1 irrigation after 2 months.
Sub-plot treatments:
Sub-sub-plot treatments:
3 manurial treatments: M_1=6·8 Kg/ha. of N+16·8 Kg/ha. of P, M_2=33·6 Kg/ha. of N+33·6 Kg/ha.
of P+16·8 Kg/ha. of K_2O and M_3=67·2 Kg/ha. of N+67·2 Kg/ha. of P+33·6 Kg/ha. of K_2O.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication ; 4 sub-plots/main-plot, 3 sub-sub-plots/sub-plot. (b) N.A. for 62 (90), 63 (52); 14.1 m. x8·5 m. for 64 (65); 2 for 62 (90); 3 for others. (iv) (a) 31 m. x2·4 m. (b) 2·4 m. x1·8 m. (v) 30 cm. x30 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Yield of seed. (iv) (a) 1952 to 1964. (b) No. (v) N.A. (vi) Nil (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5 results.

5. RESULTS:
62(90)
(i) 727 Kg/ha. (ii) (a) 14·5 Kg/ha. (b) 77·6 Kg/ha. (c) 69·0 Kg/ha. (iii) Main effects of I, V, M are highly significant and interaction I x M is significant. (iv) Av. yield of seed in Kg/ha.
<table>
<thead>
<tr>
<th></th>
<th>I₀</th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M₁</td>
<td>484</td>
<td>615</td>
<td>600</td>
<td>646</td>
<td>471</td>
<td>425</td>
<td>698</td>
<td>751</td>
<td>586</td>
</tr>
<tr>
<td>M₂</td>
<td>593</td>
<td>789</td>
<td>789</td>
<td>800</td>
<td>593</td>
<td>621</td>
<td>797</td>
<td>910</td>
<td>730</td>
</tr>
<tr>
<td>M₃</td>
<td>685</td>
<td>954</td>
<td>908</td>
<td>912</td>
<td>757</td>
<td>748</td>
<td>917</td>
<td>1033</td>
<td>865</td>
</tr>
<tr>
<td>Mean</td>
<td>587</td>
<td>769</td>
<td>766</td>
<td>786</td>
<td>607</td>
<td>598</td>
<td>804</td>
<td>900</td>
<td>727</td>
</tr>
</tbody>
</table>

C.D. for I marginal means = 13.4 Kg/ha.
C.D. for V marginal means = 48.8 Kg/ha.
C.D. for M marginal means = 30.6 Kg/ha.
C.D. for two M means at the same level of I = 61.1 Kg/ha.
C.D. for two I means at the same level of M = 51.4 Kg/ha.

63 (52)

(i) 972 Kg/ha. (ii) (a) 70.9 Kg/ha. (b) 74.4 Kg/ha. (c) 100.2 Kg/ha. (iii) Main effects of I, V, M and interaction I × V are highly significant. Interactions I × M, V × M are significant. (iv) Av. yield of seed in Kg/ha.

<table>
<thead>
<tr>
<th></th>
<th>I₀</th>
<th>I₁</th>
<th>I₂</th>
<th>I₃</th>
<th>V₁</th>
<th>V₂</th>
<th>V₃</th>
<th>V₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M₁</td>
<td>632</td>
<td>814</td>
<td>787</td>
<td>770</td>
<td>732</td>
<td>674</td>
<td>790</td>
<td>806</td>
<td>751</td>
</tr>
<tr>
<td>M₂</td>
<td>830</td>
<td>1061</td>
<td>1133</td>
<td>990</td>
<td>933</td>
<td>851</td>
<td>1029</td>
<td>1202</td>
<td>1004</td>
</tr>
<tr>
<td>M₃</td>
<td>1013</td>
<td>1152</td>
<td>1230</td>
<td>1253</td>
<td>1095</td>
<td>1033</td>
<td>1160</td>
<td>1360</td>
<td>1162</td>
</tr>
<tr>
<td>Mean</td>
<td>825</td>
<td>1009</td>
<td>1050</td>
<td>1004</td>
<td>920</td>
<td>853</td>
<td>993</td>
<td>1123</td>
<td>972</td>
</tr>
</tbody>
</table>

C.D. for I marginal means = 40.9 Kg/ha.
C.D. for M marginal means = 40.8 Kg/ha.
C.D. for V marginal means = 36.1 Kg/ha.
C.D. for two V means at the same level of I = 72.4 Kg/ha.
C.D. for two I means at the same level of V = 78.5 Kg/ha.
C.D. for two M means at the same level of I = 81.8 Kg/ha.
C.D. for two I means at the same level of M = 65.8 Kg/ha.
C.D. for two M means at the same level of V = 81.8 Kg/ha.
C.D. for two V means at the same level of M = 58.5 Kg/ha.

64 (55)

(i) 656 Kg/ha. (ii) (a) 89.7 Kg/ha. (b) 109.9 Kg/ha. (c) 95.1 Kg/ha. (iii) Main effect of I, V, M are highly significant. (iv) Av. yield of seed in Kg/ha.
Crop :- Rai (Rabi).

Site :- Govt. Agri. Res. Farm, Sultanpur.

Ref :- Rj. 63(45), 64(64).

Type :- ‘MV’.

Object: — To study the effect of different levels of N and P on different varieties of Rai.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) N.A. (iii) 22.10.63 ; 21.10.64. (iv) (a) Ploughing and 3 bakherings for 63 (45); 3 bakherings for others. (b) Drilling. (c) 7 Kgfha. (d) 30 cm. between lines. (e) N.A. (v) N.A. for 63 (45); Nil for other. (vi) As per treatments. (vii) Irrigated. (viii) 1 weeding and hoeing for 63 (45); Nil for others. (ix) N.A. for 63 (45); Nil for other. (x) 5.3.64; 10.4.65.

2. TREATMENTS :
   Main-plot treatments:
   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 4 levels of N: N₀ = 0, N₁ = 33.6, N₂ = 67.2 and N₃ = 100.9 Kg/ha.
   (2) 3 levels of P₂O₅: P₀ = 0, P₁ = 33.6 and P₃ = 67.2 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 4 main-plots/replication; 12 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 3·7 m. x 2·4 m. (b) 3·1 m. x 1·8 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Incidence of aphids, Controlled by spraying Nicotine Sulphate. (iii) Yield of grain. (iv) (a) 1963-1964. (b) No. (v) N.A. (vi) Nil. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5 results.

5. RESULTS:
   63(45)
   (i) 726 Kg/ha. (ii) (a) 62.1 Kg/ha. (b) 69.4 Kg/ha. (iii) Main effects of N, P and interaction N x V are significant. (iv) Av. yield of grain in Kg/ha.
### Crop: Til  
**Site:** (District) Pali and Banswara.  
**Object:** To study the response curves of important cereal, cash and oilseed crops to phosphorus applied singly and in combination with other nutrients (Type: A).

#### 1. Basal Conditions:
- (i) N.A.  
- (ii) Grey brown, Red and yellow;  
- (iii) to (vi) N.A.  
- (vii) Unirrigated.  
- (viii) to (x) N.A.

#### 2. Treatments:
8 manural treatments:
- O = Control (no manure).  
- \(N_1 = 22.4\) Kg/ha. of \(N\).  
- \(P_1 = 11.2\) Kg/ha. of \(P_2O_5\).  
- \(P_2 = 22.4\) Kg/ha. of \(P_2O_5\).  
- \(N_1P_1 = 22.4\) Kg/ha. of \(N\) + \(11.2\) Kg/ha. of \(P_2O_5\).  
- \(N_1P_2 = 22.4\) Kg/ha. of \(N\) + \(22.4\) Kg/ha. of \(P_2O_5\).  
- \(N_2P_2 = 44.8\) Kg/ha. of \(N\) + \(22.4\) Kg/ha. of \(P_2O_5\) + \(22.4\) Kg/ha. of \(K_2O\).  
- \(N_1P_2K_2 = 44.8\) Kg/ha. of \(N\) + \(22.4\) Kg/ha. of \(P_2O_5\) + \(22.4\) Kg/ha. of \(K_2O\).  
- \(N\) applied as \(A/S\), \(P_2O_5\) as Super and \(K_2O\) as Mur. Pot.

#### 3. Design:
Same as in Type A (unirrigated) on page no.

#### 4. General:
- (i) to (iii) N.A.  
- (b) and (c) N.A.  
- (v) to (vii) N.A.

#### 5. Results:

**Pali**  
**63 (S.F.T.)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>(N_1)</th>
<th>(P_1)</th>
<th>(P_2)</th>
<th>(N_1P_1)</th>
<th>(N_1P_2)</th>
<th>(N_2P_2)</th>
<th>(N_1P_2K_2)</th>
<th><strong>S.E.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>69</td>
<td>65</td>
<td>368</td>
<td>110</td>
<td>168</td>
<td>152</td>
<td>222</td>
<td>136 8</td>
</tr>
</tbody>
</table>

Control yield = 330 Kg/ha.; No. of trials = 6.

**63 (S.F.T.)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>(N_1)</th>
<th>(P_1)</th>
<th>(P_2)</th>
<th>(N_1P_1)</th>
<th>(N_1P_2)</th>
<th>(N_2P_2)</th>
<th>(N_1P_2K_2)</th>
<th><strong>S.E.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>46</td>
<td>56</td>
<td>77</td>
<td>106</td>
<td>137</td>
<td>181</td>
<td>214</td>
<td>33 9</td>
</tr>
</tbody>
</table>

Control yield = 471 Kg/ha.; No. of trials = 6.

**64 (S.F.T.)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>(N_1)</th>
<th>(P_1)</th>
<th>(P_2)</th>
<th>(N_1P_1)</th>
<th>(N_1P_2)</th>
<th>(N_2P_2)</th>
<th>(N_1P_2K_2)</th>
<th><strong>S.E.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>34</td>
<td>11</td>
<td>54</td>
<td>94</td>
<td>110</td>
<td>161</td>
<td>192</td>
<td>27 2</td>
</tr>
</tbody>
</table>

Control yield = 243 Kg/ha.; No. of trials = 6.
Crop :- Til.  

Ref :- Rj. 62, 63, 64, 65 (S.F.T.) for Pali and 62, 63 (S.F.T.) for Banswara.

Site :- (District) : Pali and Banswara.  
Type :- ‘M’.

Object :- To study response curves of important cereal, Cash and oilseed crops to potash, applied singly and in combination with other nutrients (Type : A3).

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) Grey brown; Red and yellow. (iii) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
O =Control (no manure).
N1 =22.4 Kg/ha. of N.
K1 =11.2 Kg/ha. of K2O.
N1K1 =22.4 Kg/ha. of N + 11.2 Kg/ha. of K2O.
N2K1 =22.4 Kg/ha. of K2O.
N1K2 =22.4 Kg/ha. of N + 22.4 Kg/ha. of K2O.
N2K2 =44.8 Kg/ha. of N + 22.4 Kg/ha. of K2O.
N1P2K1 =22.4 Kg/ha. of N + 11.2 Kg/ha. of P2O5 + 11.2 Kg/ha. of K2O.
N applied as A/S, P2O5 as Super and K2O as Mur. Pot.

3. DESIGN:
Same as in type A1 (unirrigated) on page 268.

4. GENERAL:
(i) to (ii) N.A. (iv) (a) 1962 to 1966 (1964 and 1965 N.A. for Banswara) (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:
Pali
62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>K1</th>
<th>K2</th>
<th>N1K1</th>
<th>K1K2</th>
<th>N1K2</th>
<th>N2K2</th>
<th>N1P2K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>66</td>
<td>10</td>
<td>48</td>
<td>106</td>
<td>149</td>
<td>145</td>
<td>205</td>
<td>64.2</td>
<td></td>
</tr>
</tbody>
</table>

Control yield=368 Kg/ha.; No. of trials=3.

Banswara
62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>N1P2K1</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>37</td>
<td>56</td>
<td>-2</td>
<td>66</td>
<td>123</td>
<td>168</td>
<td>175</td>
<td>31.3</td>
</tr>
<tr>
<td>Control yield=135 Kg/ha.; No. of trials=3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N1</th>
<th>P1</th>
<th>P2</th>
<th>N1P1</th>
<th>N1P2</th>
<th>N2P2</th>
<th>N1P2K2</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>79</td>
<td>51</td>
<td>64</td>
<td>93</td>
<td>98</td>
<td>200</td>
<td>222</td>
<td>38.5</td>
</tr>
<tr>
<td>Control yield=101 Kg/ha.; No. of trials=4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₁K₃</th>
<th>N₁P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>50</td>
<td>49</td>
<td>70</td>
<td>92</td>
<td>115</td>
<td>140</td>
<td>177</td>
<td>20.4</td>
</tr>
</tbody>
</table>

Control yield = 395 Kg/ha.; No. of trials = 7.

64 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₁K₃</th>
<th>N₁P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>46</td>
<td>6</td>
<td>46</td>
<td>51</td>
<td>85</td>
<td>138</td>
<td>142</td>
<td>26.3</td>
</tr>
</tbody>
</table>

Control yield = 408 Kg/ha.; No. of trials = 8.

65 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₁K₃</th>
<th>N₁P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>33</td>
<td>31</td>
<td>52</td>
<td>63</td>
<td>65</td>
<td>97</td>
<td>92</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Control yield = 192 Kg/ha.; No. of trials = 8.

Banswara

62 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₁K₃</th>
<th>N₁P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>49</td>
<td>-4</td>
<td>-2</td>
<td>76</td>
<td>84</td>
<td>123</td>
<td>157</td>
<td>30.8</td>
</tr>
</tbody>
</table>

Control yield = 118 Kg/ha.; No. of trials = 3.

63 (S.F.T.)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N₁</th>
<th>K₁</th>
<th>K₂</th>
<th>N₁K₁</th>
<th>N₁K₂</th>
<th>N₁K₃</th>
<th>N₁P₁K₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. response of Til in Kg/ha.</td>
<td>77</td>
<td>-9</td>
<td>13</td>
<td>56</td>
<td>69</td>
<td>156</td>
<td>135</td>
<td>13.8</td>
</tr>
</tbody>
</table>

Control yield = 118 Kg/ha.; No. of trials = 5.

---

**Crop:** Til.  **Ref:** Rj. 60 (SFT).  **Type:** ‘M’.

**Site:** (District): Banswara and Pali.

Object: - Type: A - To study the responses of Til to levels of N, P and K applied individually and in combination.

1. **BASAL CONDITIONS:**

   (i) (a) to (c) N.A. (ii) Red and black; Desert soil. (iii) to (x) N.A.

2. **TREATMENTS:**

   O = Control (no manure).
   N = 22.4 Kg/ha. of N as A/S.
   P = 22.4 Kg/ha. of P₂O₅ as Super.
   K = 22.4 Kg/ha. of K₂O as Mur. Pot.
   NP = 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of P₂O₅ as Super.
   NK = 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of K₂O as Mur. Pot.
   PK = 22.4 Kg/ha. of P₂O₅ as Super + 22.4 Kg/ha. of K₂O as Mur. Pot.
   NPK = 22.4 Kg/ha. of N as A/S + 22.4 Kg/ha. of P₂O₅ as Super + 22.4 Kg/ha. of K₂O as Mur. Pot.
3. DESIGN:
(i) and (ii) The district has been divided into four agriculturally homogeneous zones and one field assistant posted in each zone. The field assistant conducts the trials in one revenue circle or thana in the zone and the circle/thana is changed once in two years within the same zone. Each field assistant is required to conduct 31 trials in a year, 8 on kharif cereal, 8 on rabi cereal, 8 on cash crop, 4 on an oilseed crop and 3 on a leguminous crop. Half the number of trials conducted are of type A and the other half of type B on crops other than the legumes. The three trials on legumes are of type C. Residual effects of phosphate application are studied on Type C trials in two out of the four zones in each district every year. The experiments are laid out in randomly located fields in randomly selected villages in each of the 4 zones at the rate of one experiment per village. (iii) (a) 1/98.8 ha. (b) 1/197.7 ha. (iv) Yes.

4. GENERAL:
(i) to (vii) N.A.

5. RESULTS:

<table>
<thead>
<tr>
<th>District</th>
<th>No. of trials</th>
<th>Control yield</th>
<th>N</th>
<th>P</th>
<th>K</th>
<th>S.E.</th>
<th>NP</th>
<th>NK</th>
<th>PK</th>
<th>NPK</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banswara</td>
<td>2</td>
<td>400</td>
<td>100</td>
<td>90</td>
<td>10</td>
<td>570</td>
<td>-20</td>
<td>0</td>
<td>-20</td>
<td>120</td>
<td>590</td>
</tr>
<tr>
<td>Pali</td>
<td>4</td>
<td>490</td>
<td>20</td>
<td>20</td>
<td>50</td>
<td>150</td>
<td>-20</td>
<td>0</td>
<td>-10</td>
<td>260</td>
<td></td>
</tr>
</tbody>
</table>

Crop : Til.  
Site :- (District) : Pali.  
Ref :- Rj. 61(SFT).  
Type :- 'M'.

Object :- Type B—To investigate the relative efficiency of different nitrogenous fertilizers at different doses.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) Desert soil.  (iii) to (x) N.A.

2. TREATMENTS:

| O   = Control (no manure).  
N₁ = 22.4 Kg/ha. of N as A/S.  
N₂ = 44.8 Kg/ha. of N as A/S.  
N₁₁ = 22.4 Kg/ha. of N as Urea.  
N₂₁ = 44.8 Kg/ha. of N as Urea.  
N₁₁₁ = 22.4 Kg/ha. of N as C/A/N.  
N₂₁₁ = 44.8 Kg/ha. of N as C/A/N. |

3. DESIGN:
Same as in type A above on page 362.

4. GENERAL:
(i) to (vii) N.A.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>O</th>
<th>N₁</th>
<th>N₂</th>
<th>N₁₁</th>
<th>N₂₁</th>
<th>N₁₁₁</th>
<th>N₂₁₁</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield of Til in Kg/ha.</td>
<td>550</td>
<td>600</td>
<td>690</td>
<td>660</td>
<td>700</td>
<td>670</td>
<td>730</td>
<td>13.4</td>
</tr>
</tbody>
</table>

G.M. = 657 Kg/ha.; No of trials = 7.
Crop: Chillies.

Site: Govt. Agri. Farm, Rampura.

Object: To study the effect of N, P and K applied singly and in combinations on the yield of Chillies.

1. **BASAL CONDITIONS:**
   - (i) (a) Nil. (b) Wheat. (c) 44.8 Kg/ha of P₂O₅ and A/S.
   - (ii) Sandy loam.
   - (iii) 31.7.65.
   - (iv) (a) Poughing and harrowing by tractor. (b) Transplanting.
   - (c) 45 cm x 30 cm.
   - (d) Local. (e) Irrigated. (f) 2 weedings. (g) N.A. (x) 29.11.65 and 11.1.66.

2. **TREATMENTS:**
   - All combinations of (I), (2) and (3)
     - (1) 3 levels of N: N₀ = 0, N₁ = 49.4 Kgf/ha, N₂ = 98.8 Kgf/ha.
     - (2) 3 levels of P₂O₅: P₀ = 0, P₁ = 37.1 Kgf/ha, P₂ = 74.1 Kgf/ha.
     - (3) 3 levels of K₂O: K₀ = 0, K₁ = 37.1 Kgf/ha, K₂ = 74.1 Kgf/ha.

3. **DESIGN:**
   - (i) 3³ confd. (NPK and NPK confd).
   - (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A.
   - (iii) 2. (iv) (a) and (b) 2.5 m x 1.8 m. (v) Nil. (vi) Yes.

4. **GENERAL:**
   - (i) Good (ii) Nil. (iii) Yield of chillies. (iv) (a) 1957 only. (b) and (c) —. (v) to (vii) Nil.

5. **RESULTS:**
   - (i) 126.3 Q/ha. (ii) 36.2 Q/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of chillies in Q/ha.

<table>
<thead>
<tr>
<th></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>N₀</td>
<td>91.9</td>
<td>107.4</td>
<td>90.1</td>
<td>95.0</td>
<td>101.7</td>
<td>92.8</td>
<td>96.5</td>
</tr>
<tr>
<td>N₁</td>
<td>114.9</td>
<td>138.7</td>
<td>128.7</td>
<td>136.9</td>
<td>119.0</td>
<td>126.3</td>
<td>127.4</td>
</tr>
<tr>
<td>N₂</td>
<td>153.3</td>
<td>153.4</td>
<td>158.1</td>
<td>139.7</td>
<td>164.0</td>
<td>161.1</td>
<td>154.9</td>
</tr>
<tr>
<td>Mean</td>
<td>120.0</td>
<td>133.2</td>
<td>125.6</td>
<td>123.9</td>
<td>128.2</td>
<td>126.7</td>
<td>126.3</td>
</tr>
<tr>
<td>K₀</td>
<td>110.0</td>
<td>133.9</td>
<td>127.8</td>
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<td></td>
</tr>
<tr>
<td>K₁</td>
<td>134.5</td>
<td>135.3</td>
<td>114.8</td>
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<td></td>
</tr>
<tr>
<td>K₂</td>
<td>115.7</td>
<td>130.2</td>
<td>134.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C.D. for N marginal means = 25.0 Q/ha.

---

Crop: Chillies.

Site: Govt. Agri. Farm, Rampura.

Object: To test the relative efficacy of different fungicides on controlling die back and fruit rot of chillies.

1. **BASAL CONDITIONS:**
   - (i) (a) Nil. (b) Wheat. (c) 44.8 Kg/ha of P₂O₅ and A/S. (ii) Sandy loam. (iii) 31.7.65. (iv) (a) Poughing and harrowing by tractor. (b) Transplanting. (c) —. (d) 30 cm x 30 cm. (e) N.A. (v) 44.8 Kg/ha of P₂O₅ + 67.2 Kg/ha of N. (vi) Local. (vii) Irrigated. (viii) 2 weedings. (ix) N.A. (x) 29.11.65, 22.12.65, 17.1.66 and 2.2.66.

2. **TREATMENTS:**
   - 12 fungicides: T₀ = Control, T₁ = Fytolan 0.3%, T₂ = Bordeaux mixture 4 : 4 : 50, T₃ = Captan 0.3%, T₄ = Tamrahal 0.3%, T₅ = Colloidal copper 0.3%, T₆ = Fermox 0.2%, T₇ = Hexthane 0.1%, T₈ = Biltan 50 0.3%, T₉ = Biltan 0.3% and T₁₀ = Dithane Z-780 0.3%.
3. DESIGN:
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 3·7 m. x 2·8 m. (b) 2·7 m. x 1·8 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Yield of green pickings. (iv) (a) 1965 contd. (b) No. (c) Nil. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 324·6 Q/ha. (ii) 56·3 Q/ha. (iii) Treatment differences are not significant. (iv) Av. yield of chillies in Q/ha.

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Crop: Corriender (Rabi).

Site: Govt. Agri. Res. Farm, Borkhera.

Ref: Rj. 60(76).

Type: ‘CM’.

Object: To study the effect of different dates of sowing and levels of N and P on the yield of Corriender.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Fallow. (c) No. (ii) Clay loam. (iii) As per treatments. (iv) (a) 3 ploughings. (b) and (c) N.A. (d) Row to row 30 cm. (e) N.A. (v) N.A. (vi) Local. (vii) and (viii) No. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 dates of sowing: D_1 = 13.10.60, D_2 = 23.10.60 and D_3 = 3.11.60.

   Sub-plot treatments:
   All combinations of (1) and (2)
   (1) 3 levels of N: N_0 = 0, N_1 = 16·8 and N_2 = 33·6 Kg/ha.
   (2) 3 levels of P: P_0 = 0, P_1 = 16·8 and P_2 = 33·6 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block; 9 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 5·8 m. x 2·7 m. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Yield of grain. (iv) (a) 1960 only. (b) and (c) N.A. (v) and (vi) N.A. (vii) Light frost.

5. RESULTS:
   (i) 1116 Kg/ha. (ii) (a) 175·0 Kg/ha. (b) 225·6 Kg/ha. (iii) Main effects of D, N and P are highly significant. (iv) Av. yield of corriender in Kg/ha.
Crop :- Corriender (Rabi).

Site :- Govt. Agri. Res. Farm, Borkhera

Object :- To study the effect of different dates of sowing and levels of N, P and K on the yield of Corriender.

1. BASAL CONDITIONS :
   (i) (a) No. (b) Fallow. (c) N.A. (ii) N.A. (iii) As per treatments. (iv) (a) 1 ploughing, 2 bhukering1 and 1 pata. (b) N.A. (c) 25 Kg/ha. (d) Row to row 33 cm. (e) N.A. (f) Local. (vii) to (x) N.A.

2. TREATMENTS :
   Main-plot treatments :
   3 dates of sowing : D1=23.10.61, D2=3.11.61 and D3=13.11.61.

   Sub-plot treatments :
   All combinations of (1), (2) and (3)
   (1) 3 levels of N : N0=0, N1=33.6 and N2=67.2 Kg/ha.
   (2) 3 levels of P : P0=0, P1=33.6 and P2=67.2 Kg/ha.
   (3) 3 levels of K : K0=0, K1=33.6 and K2=67.2 Kg/ha.

3. DESIGN :
   (i) Split-plot. (ii) (a) 3 main-plots/block ; 27 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) 3·1 m. x 2·4 m. (b) 2·4 m. x 1·8 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Yield of Corriender. (iv) (a) 1951—1952 (dates changed in 62). (b) and (c) N.A. (v) and (vi) N.A. (vii) Frost—appeared in December.

5. RESULTS :
   (i) 756 Kg/ha. (ii) (a) 46.6 Kg/ha. (b) 99.6 Kg/ha. (iii) Main effects of D, N, P and interaction N x P, D x N, D x P are highly significant. Interaction P x K is significant. (iv) Av. yield of corriender in Kg/ha.
Crop: Corriender (Rabi).

Site: Govt. Agri. Res. Farm, Borkhera.

Object: To find out the optimum date of sowing with fertilizer requirement.

1. BASAL CONDITIONS:

   (i) (a) N.A. (b) Fallow. (c) Nil. (ii) N.A. (iii) As per treatments. (iv) (a) and (b) N.A. (e) 7 Kg/ha.
   (d) Rows 30 cm. apart. (e) N.A. (v) N.A. (vi) Local. (vii) Unirrigated. (viii) 1 weeding. (ix) N.A. (x)
   15.2.63, 9.3.63 and 13.3.63.

2. TREATMENTS:

   Main-plot treatments:
   Sub-plot treatments: and 3. DESIGN:
   Same as in Expt. No. 61(103) on page 366.

4. GENERAL:

   (i) Frost, in the month of Dec., affected the quality of early dates. (ii) N.A. (iii) Yield of Corriender. (iv)
   (a) 1961-62 [Treatments changed in 62]. (b) and (c) N.A. (v) to (vii) N.A.

5. RESULTS:

   (i) 822 Kg/ha. (ii) (a) 53'8 Kg/ha. (b) 1110'0 Kg/ha. (iii) Main effect of D alone is highly significant. (iv)
   Av. yield of Corriender in Kg/ha.
Crop: Corriender (Rabi).
Site: Govt. Agri. Res. Farm, Borkhera.

Object: To find out the suitable schedule of irrigation, fertilizer and seed rate for Corriender crop.

1. BASAL CONDITIONS:
   (i) (a) N.d. (b) Jowar. (c) Nil. (ii) Clay loam. (iii) 14.11.63. (iv) (a) 1 ploughing, 1 planking, 1 band-sowing and 1 harrowing. (b) Behind the plough in rows. (c) As per treatments. (d) Between lines 33 cm. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 1 hoeing. (ix) 19 cm. (x) 12.3 64.

2. TREATMENTS:
   Main-plot treatments:
   4 times irrigation: I₄=Na irrigation, I₃=1 irrigation after one month, I₂=1 irrigation at flowering, I₁=one irrigation after one month and one irrigation at flowering.

   Sub-plot treatments:
   5 seed rates: R₁=7, R₂=.0, R₃=12, R₄=15 and R₅=17 Kg/ha.

   Sub-sub-plot treatments:
   3 levels of fertilizers: M₄=Control, M₃=33.6 Kg/ha. of N as A/S+33.6 Kg/ha. of P₂O₅ as Super-16 8 Kg/ha. of K₂O as Pot. Chloride and M₂=67.2 Kg/ha. of N as A/S+67.2 Kg/ha. of P₂O₅ as Super+33.6 Kg/ha. of K₂O as Pot. Chloride.

3. DESIGN:
   (i) Split-plot. (ii) 4 main-plots replication; 5 sub-plots/main-plot, 3 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) (a) 3·1 m. x 3·1 m. (b) 2·4 m. x 2·4 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Yield of Corriender. (iv) (a) 1962—contd. (b) No. (c) N.A. (v) N.A. (vi) Frost. (vii) N.A.

5. RESULTS:
   (i) 903 Kg/ha. (ii) (a) 386 Kg/ha. (b) 198·0 Kg/ha. (c) 217·0 Kg/ha. (iii) Mean effects of I and M are significant and interaction I x M is highly significant. (iv) Av. yield of Corriender in Kg/ha.
Crop: - Cumin (Rabi).
Site: - Govt. Agri. Farm, Tonk.

Object: - To study the effect of different methods of application of N, P and K on the yield of Cumin.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Maize. (c) 44.8 Kg/ha. of N+44.8 Kg/ha. of P₂O₅. (ii) N.A. (iii) 24.11.64. (iv) (a) 2 ploughings. (b) Drilling. (c) 12 Kg/ha. (d) Between lines 30 cm. (e) N.A. (v) Nil. (vi) S. 404. (vii) Irrigated. (viii) 2 weedings. (ix) Nil. (x) 11.3.65.

2. TREATMENTS:
   Main-plot treatments:
   4 methods of application: M₁ = All based by broadcasting, M₂ = All based by drilling, M₃ = by broadcasting + ½ as top dressing and M₄ = by drilling + ½ as top dressing.
   Sub-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N₀ = 0, N₁ = 50.4 and N₂ = 100.9 Kg/ha.
   (2) 3 levels of P: P₀ = 0, P₁ = 50.4 and P₂ = 100.9 Kg/ha.
   (3) 3 levels of K: K₀ = 0, K₁ = 50.4 and K₂ = 100.9 Kg/ha.

3. DESIGN:
   (i) Split-plot confd., N² PK is confd. (ii) (a) 3 blocks/replication, 4 main-plots/block; 9 sub-plots/main-plot. (b) N.A. (iii) 21.3.64. (iv) (a) 3'1 m. x 2'4 m. (b) 2'4 m. x 1'8 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Incidence of powdery mildew; Sulphur dusting on 27.1.65. (iii) Height, stand, No. of umbles, No. of branches and yield of Cumin. (iv) (a) 1963—contd. (b) No. (c) N.A. (v) and (vi) N.A. (vii) Nil.

5. RESULTS:
   (i) 668 Kg/ha. (ii) (a) 382 Kg/ha. (b) 199 Kg/ha. (iii) Main effect of P alone is highly significant. (iv) Av. yield of Cumin in Kg/ha.
Crop :- Cumin (Rabi).
Site :- Govt. Agri. Farm, Bassi.

Object :- To study the effect of different seed rates and sprayings on the yield of Cumin.

1. BASAL CONDITIONS :
   (i) (a) No. (b) N.A. (c) Nil. (ii) N.A. (iii) 20.12.61. (iv) (a) 6 ploughings. (b) to (d) As per treatments.
   (e) N.A. (v) Basal dose of 44.8 Kg/ha. of N as A/S. Basal dose of 44.8 Kg/ha. of N as A/S+22.4 Kg/ha.
   of P₀₂₅ as Super+22.4 Kg/ha. of K₂O as Mur. Pot. (vi) K₁. (vii) Irrigated. (viii) 2 weedings. (ix) N.A.
   (x) 10.4.62.

2. TREATMENTS :
   Main-plot treatments :
   4 methods of sowing : M₁ = Broadcast, M₂ = 15 cm. spacing between rows, M₃ = 30 cm. spacings
   between rows and M₄ = 46 cm. spacing between rows.

   Sub-plot treatments :
   4 seed rates : R₁ = 11, R₂ = 17, R₃ = 22 and R₄ = 28 Kg/ha.

3. DESIGN :
   (i) Split-plot. (ii) (a) 4 main-plots/block; 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 3.1 m. x 1.8 m.
   (b) 2.4 m. x 1.4 m. (v) 30 cm. x 23 cm. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Yield of Cumin. (iv) to (vii) N.A.

5. RESULTS :
   (i) 216.0 Kg/ha. (ii) (a) 132.6 Kg/ha. (b) 96.2 Kg/ha. (iii) Main effect of M alone is significant. (iv) Av.
   yield of Cumin in Kg/ha.

C.D. for P marginal means = 93.2 Kg/ha.

Ref :- Rj. 61(83). Type :- 'C'.

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C.D. for M marginal means = 106.1 Kg/ha.

Crop: Cumin (Rabi).

Site: Govt. Agri. Farm, Tonk.

Ref: Rj. 61(94), 62(87), 63(57).

Object: To study the optimum date of sowing with different seed rates and method of sowing.

1. BASAL CONDITIONS:
   (i) (a) N.A. for 61(94); Cumin-Fallow for 62(87), N.A. for 63(57). (b) N.A. for 61(94) and 63(57); Fallow for 62(87). (c) N.A. (ii) N.A. for 61(94) and 63(57); Sandy loam for 62(87). (iii) As per treatments.
   (iv) (a) 2—4 ploughings and 2 bukherings. (b) to (d) As per treatments. (e) N.A. (v) 504 Kg/ha. each of N, P and K for 61(94) and 63(57); N.A. for 62(87). (vi) Local for 61(94) and 62(87); S-404 for 63(57). (vii) Irrigated. (viii) 1-2 weedings; 1 hoeing for 63(57). (ix) N.A. (x) N.A. for 61(94) and 63(57); 2, 3, 15.3.63 for 62(87).

2. TREATMENTS:
   Main-plot treatments:
   4 dates of sowing D₁=30th Oct.; D₂=9th Nov.; D₃=19th Nov. and D₄=29th Nov.
   Sub-plot treatments:
   4 methods of sowing: M₁= Broadcasting, M₂=15 cm. spacing between rows; M₃=30 cm. spacing between rows and M₄=46 cm. drilling.
   Sub-sub-plot treatments:
   4 seed rates: R₁=11, R₂=17, R₃=22 and R₄=28 Kg/ha.

3. DESIGN:
   (i) Split plot. (ii) (a) 4 main-plots/replication, 4 sub-plots/main-plot, 4 sub-plots/sub-sub-plot. (b) N.A. for 61(94) and 62(87); 30.5 m.×19.1 m. for 63(57). (iii) 2. (iv) (a) 3'7 m.×2'4 m. for 61(94), 3'1 m.×2'4 m. for 62(87) and 3'1 m.×1'8 m. for 63(57). (b) 3'1 m.×1'8 m. for 61(94); 2'4 m.×1'8 m. for 62(87) and 2'4 m.×1'2 m. for 63(57). (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL:
   (i) N.A. for 61(94); Normal for 62(87); Good for 63(57). (ii) Attack of powdery Mildew; Sulphur dusting. (iii) Yield of cumin. (iv) (a) 1961-63 (b) No. (c) Nil.(v) and (vi) N.A. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS:

61(94)
   (i) 604 Kg/ha. (ii) a) 91·2 Kg/ha. (b) 114·2 Kg/ha. (c) 97.6 Kg/ha. (iii) Main effects of D, M, R and interaction D×M×R are highly significant. Interaction M×R is significant. (iv) Av. yield of cumin in Kg/ha.

Object: To study the optimum date of sowing with different seed rates and method of sowing.

1. BASAL CONDITIONS:
   (i) (a) N.A. for 61(94); Cumin-Fallow for 62(87), N.A. for 63(57). (b) N.A. for 61(94) and 63(57); Fallow for 62(87). (c) N.A. (ii) N.A. for 61(94) and 63(57); Sandy loam for 62(87). (iii) As per treatments.
   (iv) (a) 2—4 ploughings and 2 bukherings. (b) to (d) As per treatments. (e) N.A. (v) 504 Kg/ha. each of N, P and K for 61(94) and 63(57); N.A. for 62(87). (vi) Local for 61(94) and 62(87); S-404 for 63(57). (vii) Irrigated. (viii) 1-2 weedings; 1 hoeing for 63(57). (ix) N.A. (x) N.A. for 61(94) and 63(57); 2, 3, 15.3.63 for 62(87).

2. TREATMENTS:
   Main-plot treatments:
   4 dates of sowing D₁=30th Oct.; D₂=9th Nov.; D₃=19th Nov. and D₄=29th Nov.
   Sub-plot treatments:
   4 methods of sowing: M₁= Broadcasting, M₂=15 cm. spacing between rows; M₃=30 cm. spacing between rows and M₄=46 cm. drilling.
   Sub-sub-plot treatments:
   4 seed rates: R₁=11, R₂=17, R₃=22 and R₄=28 Kg/ha.

3. DESIGN:
   (i) Split plot. (ii) (a) 4 main-plots/replication, 4 sub-plots/main-plot, 4 sub-plots/sub-sub-plot. (b) N.A. for 61(94) and 62(87); 30.5 m.×19.1 m. for 63(57). (iii) 2. (iv) (a) 3'7 m.×2'4 m. for 61(94), 3'1 m.×2'4 m. for 62(87) and 3'1 m.×1'8 m. for 63(57). (b) 3'1 m.×1'8 m. for 61(94); 2'4 m.×1'8 m. for 62(87) and 2'4 m.×1'2 m. for 63(57). (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL:
   (i) N.A. for 61(94); Normal for 62(87); Good for 63(57). (ii) Attack of powdery Mildew; Sulphur dusting. (iii) Yield of cumin. (iv) (a) 1961-63 (b) No. (c) Nil.(v) and (vi) N.A. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS:

61(94)
   (i) 604 Kg/ha. (ii) a) 91·2 Kg/ha. (b) 114·2 Kg/ha. (c) 97.6 Kg/ha. (iii) Main effects of D, M, R and interaction D×M×R are highly significant. Interaction M×R is significant. (iv) Av. yield of cumin in Kg/ha.
### Table 1

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<td>650</td>
<td>628</td>
<td>421</td>
<td>555</td>
<td>560</td>
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<tr>
<td>D2</td>
<td>420</td>
<td>768</td>
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<td>639</td>
<td>504</td>
<td>549</td>
<td>650</td>
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<tr>
<td>D3</td>
<td>594</td>
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<td>734</td>
<td>667</td>
<td>813</td>
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<tr>
<td>D4</td>
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<td>430</td>
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<td>572</td>
<td>499</td>
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<td>523</td>
<td>615</td>
<td>637</td>
<td>643</td>
<td>523</td>
<td>587</td>
<td>640</td>
<td>668</td>
</tr>
</tbody>
</table>

C.D. for D marginal means = 72.5 Kg/ha.
C.D. for M marginal means = 62.3 Kg/ha.
C.D. for R marginal means = 49.1 Kg/ha.
C.D. for R means at the same level of M = 98.2 Kg/ha.
C.D. for M means at the same level of R = 105.3 Kg/ha.

56 (87)

(i) 558 Kg/ha. (ii) (a) 18.3 Kg/ha. (b) 60.3 Kg/ha. (c) 55.2 Kg/ha. (iii) Main effects of D, M, R are highly significant. Interaction M × R is significant. (iv) Av. yield of cumin in Kg/ha.

### Table 2

<table>
<thead>
<tr>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>Mean</th>
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<tr>
<td>D1</td>
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<td>569</td>
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<td>558</td>
<td>370</td>
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<td>488</td>
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<td>D3</td>
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<td>673</td>
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<td>574</td>
<td>545</td>
<td>374</td>
<td>524</td>
<td>628</td>
<td>704</td>
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</tbody>
</table>

C.D. for D marginal means = 14.6 Kg/ha.
C.D. for M marginal means = 32.9 Kg/ha.
C.D. for R marginal means = 27.8 Kg/ha.
C.D. for R means at the same level of M = 55.6 Kg/ha.
C.D. for M means at the same level of R = 58.1 Kg/ha.

63 (57)

(i) 1032 Kg/ha. (ii) (a) 150 Kg/ha. (b) 126 Kg/ha. (c) 1691 Kg/ha. (iii) Main effects of D and M are highly significant and interaction D × M is significant. (iv) Av. yield of cumin in Kg/ha.
Crop: Guar (Rabi).
Site: Govt. Agri. Res. Farm, Sriganganagar.
Object: To study the effect of different levels of green matters added to soil as green manures and levels of N and P on the yield of Guar.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 8.11.64.
(iv) (a) 3 cultivations and 2 discings with tractor 1 ploughing and a planking with bullock. (b) Line sowing. (c) 212 Kg/ha. (d) Between lines 23 cm. (e) N.A. (v) Nil. (vi) C-591. (vii) Irrigated. (viii) 2 hoeings and weeding. (ix) 1 em. (x) 24, 25.4.65.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 4 levels of green matters: \( G_0 = 0, G_1 = 224, G_2 = 448 \) and \( G_3 = 672 \) Kg/ha.
(2) 2 levels of N as A/S: \( N_0 = 0 \) and \( N_1 = 33.6 \) Kg/ha.
(3) 3 levels of \( P_2O_5 \) as Super: \( P_0 = 0, P_1 = 33.6 \) and \( P_2 = 67.2 \) Kg/ha.
Green matters were applied on 12.8.64, \( P_2O_5 \) by drilling on 8.11.64 and N broadcast at the time of sowing and at the time of 1Ind irrigation.

3. DESIGN:
(i) \( 4 \times 3 \times 2 \) confd. (ii) (a) 12 plots/block; 2 blocks/replication. (b) N.A. (iii) 3. (iv) (a) 9:2 m. x 5:5 m. (b) 7:4 m. x 3:7 m. (v) 91 cm. x 91 cm. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) B.H.C. at 44\( ^\circ \) 8 Kg/ha. applied at the time of sowing. (iii) Yield of guar. (iv) (a) 1964—N.A. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 1691 Kg/ha. (ii) 177.4 Kg/ha. (iii) Main effect of N alone is highly significant. (iv) Av. yield of guar in Kg/ha.
Crop :- Guar (Kharij).

Site :- Govt. Agri. Farm, Durgapura.

Object :- To test the relative efficacy of different fungicides in controlling the blight disease of Guar.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Pea. (c) N.A. (ii) Sandy. (iii) 10.7.64. (iv) (a) 2 ploughings. (b) Behind the plough. (c) 25 Kg/ha. (d) Between lines 30 cm. (e) N.A. (v) 5 Kg/ha. of P₂O₅ drilled and 5 Kg/ha. of A/S broadcast. (vi) Local. (vii) Unirrigated. (viii) 2 weedings. (ix) N.A. (x) 18.11.64.

2. TREATMENTS :
10 fungicidal treatments : T₀=Control, T₁=Shell copper 0·3%, T₂=Crag 658 0·2%, T₃=Bordeaux mixture 4:4:50, T₄=Dithane 278, 0·3%, T₅=Copramar 0·3%, T₆=Tamarghal 0·3%, T₇=Ultra sulphur 0·2%, T₈=Blitox 0·2% and T₉=Ferbam 0·2%.

3. DESIGN :
(i) Incomplete L. Sq. (ii) (a) 3 plots/block ; 10 blocks/sq., 3 sqs. (b) N.A. (iii) 9. (iv) (a) 2·7 m. x 1·8 m. (b) 1·8 m. x 1·2 m. (v) 46 cm. x 30 cm. (vi) Yes.

4. GENERAL :
(i) N.A. (ii) Incidence of blight disease; control measures as per treatments. (iii) Disease intensity on leaf and stem of Guar and grain yield. (iv) (a) 1964 only. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) B.H.C. powder broadcast before sowing on 10.7.64.

5. RESULTS :
(i) 2134 Kg/ha. (ii) 364 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₀</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
<th>T₄</th>
<th>T₅</th>
<th>T₆</th>
<th>L₅</th>
<th>T₉</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>2310 1987 2310 1866 1978 2108 2440 2108 1996 2234</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy. (iii) 30.7.64. (iv) (a) 2 ploughings. (b) Behind the plough. (c) 25 Kg/ha. (d) Between lines 46 cm. and between plants as usual. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) One weeding with kharpi. (ix) N.A. (x) 10.11.64.

2. TREATMENTS:
   9 fungicidal treatments: 
   $T_0$ = Control, $T_1$ = Spersul 0.5% at 674 litres/ha., $T_2$ = Elo sul 0.5% at 674 litres/ha., $T_3$ = Ghandhakghal 0.5% at 674 litres/ha., $T_4$ = Karathane W.D. 0.2% at 674 litres/ha., $T_5$ = Wettable sulphur W.P. 0.5% at 674 litres/ha., $T_6$ = Ultra sulphur 0.3% at 674 litres/ha., $T_7$ = Sulphur dust at 11.2 Kg/ha., mixed with ash at 5.6 Kg/ha., and $T_8$ = Sulphur dust at 16.8 Kg/ha.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 5. (iv) and (b) 2.7 m. x 1.8 m. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil because powder mildew not appeared. (iii) Yield of guar. (iv) (a) 1964 only. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 544 Kg/ha. (ii) 1480 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of grain in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
<th>$T_8$</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>556</td>
<td>423</td>
<td>584</td>
<td>588</td>
<td>596</td>
<td>508</td>
<td>492</td>
<td>590</td>
<td>558</td>
</tr>
</tbody>
</table>

Crop :- Guar (Kharif).
Site :- Govt. Agri. Farm, Mandore.

Object :- To test the relative efficacy of different fungicides in controlling the blight disease of Guar.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Fallow. (c) Nil. (ii) Sandy. (iii) 30.7.64 and resowing on 22.8.64. (iv) (a) One ploughing. (b) Behind the plough. (c) 25 Kg/ha. (d) Between lines 30 cm. and between plants N.A. (e) N.A. (v) Nil. (vi) Local. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 11.11.64.

2. TREATMENTS:
   10 fungicidal treatments: 
   $T_0$ = Control, $T_1$ = Shell copper 0.3%, $T_2$ = Crag 658 0.2%, $T_3$ = Bordeaux mixture 4:4:50, $T_4$ = Dithane Z-70 0.3%, $T_5$ = Kirti copper 0.3%, $T_6$ = Tamraghal 0.3%, $T_7$ = Ultra sulphur 0.2%, $T_8$ = Colloidal sulphur 0.2% and $T_9$ = Ferbam 0.2%.

3. DESIGN:
   (i) Incomplete L. Sq. (ii) (a) 3 plots/block; 10 blocks/sq. and 3 Sqs. (b) 30:2 m. x 67 m. (iii) 9. (iv) (a) 2.7 m. x 1.8 m. (b) 1.8 m. x 1.2 m. (v) 46 cm. x 30 cm. (vi) Yes.

4. GENERAL:
   (i) Poor. (ii) Blight disease did not appear. (iii) Grain yield. (iv) (a) 1964 only. (b) No. (c) N.A. (v) N.A (vi) and (vii) Nil.

5. RESULTS:
   (i) 1472 Kg/ha. (ii) 8820 Kg/ha. (iii) Treatment differences are not significant. (iv) Av. yield of guar in Kg/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_0$</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
<th>$T_7$</th>
<th>$T_8$</th>
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</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>1839</td>
<td>2090</td>
<td>1117</td>
<td>1260</td>
<td>1435</td>
<td>1372</td>
<td>1023</td>
<td>1610</td>
<td>1296</td>
</tr>
</tbody>
</table>
Crop :- Jowar (Fodder).
Site :- Govt. Agri. Res. Farm, Ganganagar.

Object :- To study the effect of different levels of N and seed rates on the yield of Jowar.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Fallow. (c) Nil. (ii) Sandy loam. (iii) 8.5/65. (iv) (a) Ploughing and harrowing. (b) Behind the plough. (c) As per treatments. (d) 23 cm. x 23 cm. (e) N.A. (v) 49:4 Kg/ha. of P₂O₅. (vi) Local. (vii) Irrigated. (viii) 4 weedings. (ix) N.A. (x) 2, 3 and 4.11.65.

2. TREATMENTS:
   Main-plot treatments:
   - 8 seed rates:
     - R₁ = Jowar at 37·1 Kg/ha., R₂ = Jowar at 49·4 Kg/ha., R₃ = Guar at 37·1 Kg/ha., R₄ = Guar at 49·4 Kg/ha., R₅ = Jowar + Guar at 37·1 Kg/ha. (1 : 1), R₆ = Jowar + Guar at 37·1 Kg/ha. (2 : 1), R₇ = Jowar + Guar at 49·4 Kg/ha. (1 : 1), R₈ = Jowar + Guar at 49·4 (2 : 1).
   - 3 levels of N:
     - N₀ = 0, N₁ = 37·1 and N₂ = 74·1 Kg/ha.

   Sub-plot treatments:
   - 3 levels of N:
     - N₀ = 0, N₁ = 37·1 and N₂ = 74·1 Kg/ha.

3. DESIGN:
   (i) Split-plot. (ii) (a) 8 main-plots; replication = 3 sub-plots/main-plot. (b) N.A. (iii) 16.6.65. (iv) (a) 6·1 m. x 4·6 m. (b) 5·6 m. x 4·1 m. (c) 23 cm. x 23 cm. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Endris 0'1%o was sprayed against Borers in Jowar on 16.6.65. (iii) Yield of Jowar fodder. (iv) (a) 1965 only. (b) No. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
   (i) 228·7 Q/ha. (ii) (a) 44'1 Q/ha. (b) 28'9 Q/ha. (iii) Main effects of N, R and interaction N x R are highly significant. (iv) Av. yield of fodder in Q/ha.

<table>
<thead>
<tr>
<th>N₀</th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>R₅</th>
<th>R₆</th>
<th>R₇</th>
<th>R₈</th>
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</tr>
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<td>187.0</td>
<td>185.3</td>
<td>160.6</td>
<td>143.3</td>
<td>225.7</td>
<td>238.7</td>
<td>262.9</td>
<td>209.0</td>
<td>201.6</td>
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</tr>
<tr>
<td>266.1</td>
<td>259.7</td>
<td>140.6</td>
<td>258.6</td>
<td>313.0</td>
<td>255.9</td>
<td>277.5</td>
<td>235.6</td>
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</tr>
<tr>
<td>284.5</td>
<td>295.8</td>
<td>113.1</td>
<td>114.8</td>
<td>272.8</td>
<td>297.4</td>
<td>303.9</td>
<td>283.9</td>
<td>249.1</td>
<td></td>
</tr>
</tbody>
</table>

Mean 245.9 246.9 137.7 132.9 252.4 283.0 274.2 256.8 228.7

C.D. for R marginal means = 37·4 Q/ha.
C.D. for N marginal means = 15·4 Q/ha.
C.D. for N means at the same level of R = 43·7 Q/ha.
C.D. for R means at the same level of N = 49·8 Q/ha.

Crop :- Fodder crops (Rabi).
Site :- Govt. Agri. Res. Farm, Borkhera.

Object :- To find out the suitable forage crops with optimum fertilizers requirements.

1. BASAL CONDITIONS:
   (i) (a) Fallow-Wheat-Paddy-Forage for 62 (91); Nil for others. (b) Paddy for 62 (91); Jowar chari for 63 (53); Fallow for 64 (46). (c) Nil. (ii) N.A. (iii) 31.10.62; 31.10.63; 20.11.64. (iv) (a) 1 ploughing, 2 bakhering and 1 pata (b) Broadcasting. (c) 25 Kg/ha. (d) and (e) N.A. (v) Nil for 62 (91); 64 (46); N.A. for 63 (53). (vi) Local for 62 (91); N.A. for others. (vii) Irrigated. (viii) Nil. (a) Nil for 62 (91); 64 (46); N.A. for 63 (53). (x) 9 cuttings from 15.12.62 to 18.4.63 for 62 (91); 3 cuttings from 14.1.64 to 5.3.64 for 63 (53); 5 cuttings from 21.1.65 to 18.5.65 for 64 (46).
2. TREATMENTS:

Main-plot treatments:
- 2 forage crops: \(C_1=\text{Berseem}\) and \(C_2=\text{Senji}\).

Sub-plot treatments:
- All combinations of (1), (2) and (3).
  - (1) 2 levels of \(N\): \(N_0=0\) and \(N_1=44.8\) Kg/ha.
  - (2) 4 levels of \(P\): \(P_0=0\), \(P_1=44.8\), \(P_2=89.7\) and \(P_3=134.5\) Kg/ha.
  - (3) 2 levels of \(K\): \(K_0=0\) and \(K_1=44.8\) Kg/ha.

3. DESIGN:

(i) Split-plot confd. (ii) (a) 2 main-plots/replication; 2 blocks/main plot and 8 sub-plots/block. (b) 48.8 m.\(\times\)36.6 m. for 62 (91); N.A. for others. (iii) 2. (iv) (a) 6.1 m.\(\times\)4.6 m. for 62 (91); N.A. for others. (v) Nil for 62 (91); N.A. for others. (vi) Yes.

4. GENERAL:

(i) Normal for 62 (91), 63 (53); Good for 64 (46). (ii) Nil. (iii) Yield of fodder. (iv) (a) 1962 to 1964. (b) No. (c) Nil (v) and (vi) Nil. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS:

62(91):

<table>
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<tr>
<th></th>
<th>(P_0)</th>
<th>(P_1)</th>
<th>(P_2)</th>
<th>(P_3)</th>
<th>(N_0)</th>
<th>(N_1)</th>
<th>(K_0)</th>
<th>(K_1)</th>
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<tbody>
<tr>
<td>(C_1)</td>
<td>251.6</td>
<td>465.2</td>
<td>533.8</td>
<td>526.9</td>
<td>341.2</td>
<td>547.5</td>
<td>441.8</td>
<td>446.9</td>
<td>444.4</td>
</tr>
<tr>
<td>(C_2)</td>
<td>204.6</td>
<td>251.3</td>
<td>280.0</td>
<td>293.1</td>
<td>236.9</td>
<td>277.6</td>
<td>250.0</td>
<td>263.5</td>
<td>257.2</td>
</tr>
<tr>
<td>Mean</td>
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<td>358.2</td>
<td>406.9</td>
<td>410.0</td>
<td>289.0</td>
<td>412.6</td>
<td>346.4</td>
<td>355.2</td>
<td>350.8</td>
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<td>407.0</td>
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<tr>
<td>(K_1)</td>
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<tr>
<td>(N_1)</td>
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<td>502.9</td>
<td>477.8</td>
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</tr>
</tbody>
</table>

C.D. for \(C\) marginal means = 74.9 Q/ha.
C.D. for \(P\) marginal means = 46.2 Q/ha.
C.D. for \(N\) marginal means = 32.6 Q/ha.
C.D. for \(P\) means at the same level of \(C\) = 65.3 Q/ha.
C.D. for \(C\) means at the same level of \(P\) = 71.3 Q/ha.
C.D. for \(N\) means at the same level of \(C\) = 46.2 Q/ha.
C.D. for \(C\) means at the same level of \(N\) = 57.2 Q/ha.

63(53):

<table>
<thead>
<tr>
<th></th>
<th>(P_0)</th>
<th>(P_1)</th>
<th>(P_2)</th>
<th>(P_3)</th>
<th>(N_0)</th>
<th>(N_1)</th>
<th>(K_0)</th>
<th>(K_1)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>(C_1)</td>
<td>279.9</td>
<td>481.5</td>
<td>534.4</td>
<td>519.6</td>
<td>369.3</td>
<td>538.4</td>
<td>449.2</td>
<td>458.5</td>
<td>453.8</td>
</tr>
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<td>(C_2)</td>
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<td>360.8</td>
<td>360.2</td>
<td>298.1</td>
<td>335.6</td>
<td>307.7</td>
<td>326.0</td>
<td>316.8</td>
</tr>
<tr>
<td>Mean</td>
<td>260.4</td>
<td>393.4</td>
<td>447.6</td>
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<tr>
<td>(N_1)</td>
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<td>496.2</td>
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</table>
C.D. for C marginal means = 85.6 Q/ha.
C.D. for P marginal means = 14.1 Q/ha.
C.D. for N or K marginal means = 9.9 Q/ha.
C.D. for P means at the same level of C = 20.0 Q/ha.
C.D. for C means at the same level of P = 60.0 Q/ha.
C.D. for N means at the same level of C = 14.1 Q/ha.
C.D. for C means at the same level of N = 75.4 Q/ha.
C.D. for means in the body of P x N table = 20.0 Q/ha.

(i) 428.7 Q/ha. (ii) (a) 9.5 Q/ha. (b) 19.1 Q/ha. (iii) Main effects of N, P and interactions C x P, C x N, C x P x N are highly significant and main effect of K and interaction P x N are significant. (iv) Av. yield of fodder in Q/ha.

<table>
<thead>
<tr>
<th>P</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
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<th>N₁</th>
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<td>445.8</td>
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</tbody>
</table>

C.D. for N or K marginal means = 9.9 Q/ha.
C.D. for P marginal means = 13.9 Q/ha.
C.D. for P means at the same level of C = 19.6 Q/ha.
C.D. for C means at the same level of P = 24.7 Q/ha.
C.D. for N means at the same level of C = 13.9 Q/ha.
C.D. for C means at the same level of N = 22.2 Q/ha.
C.D. for means in the body of N x P table = 13.9 Q/ha.

Crop : Fodder crop (Kharif).
Ref : Rj. 62(36), 63(32), 64(22).
Site : Govt. Agri. Res. Farm, Sriganganagar. Type : ‘CM’.

Object : To find out a suitable seed rate legume mixture for chari jowar at different fertility levels.

1. BASAL CONDITIONS :
(i) (a) Wheat-Chari Jowar for 62 (36); Nil for others. (b) Wheat for 62 (36); Fallow for 63 (32); Nil for 64 (22). (c) N.A. (ii) N for 62 (36); Sandy loam for others. (iii) 7.7.62; N.A. for 63 (32); 13.6.64. (iv) (a) 2 to 4 ploughings. (b) N.A. (c) As per treatments. (d) and (e) N.A. (v) N.A. for 63 (32); 44.8 Kg/ha. of P₂O₅ for 62 (36) and 64 (22). (vii) Local. (vii) Irrigated. (viii) N.A. for 62 (36), 63 (32); one hoeing for 64 (22). (ia) N.A. (xi) 10.10.62; 10.10.63; 4.10.64.

2. TREATMENTS :
Main-plot treatments:
7 seed rates of fodder crops : S₁ = 44.8 Kg/ha. of Jowar alone, S₂ = 44.8 Kg/ha. of Jowar and 44.8 Kg/ha. of Guar, S₃ = 44.8 Kg/ha. of Jowar and 22.4 Kg/ha. of Guar, S₄ = 67.2 Kg/ha. of Jowar alone, S₅ = 67.2 Kg/ha. of Jowar and 67.2 Kg/ha. of Guar, S₆ = 67.2 Kg/ha. of Jowar and 33.6 Kg/ha. of Guar and S₇ = 44.8 Kg/ha. of Guar alone.

Sub-plot treatments:
3 levels of N : N₀ = 0, N₁ = 33.6 and N₂ = 67.2 Kg/ha.

3. DESIGN :
(i) Split-plot. (ii) (a) 7 main-plots/replication ; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b) 6.1 m. x 4.6 m. (v) Nil. (vi) Yes.
4. GENERAL:
(i) N.A. for 62 (36); Good for others. (ii) N.A. (iii) Yield of green fodder. (iv) (a) 1962 to 1964. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) Since the sub-plot error variances are heterogenous, results of individual years are presented under 5. Results.

5. RESULTS:

62(36)
(i) 201·8 Q/ha. (ii) a) 31·9 Q/ha. (b) 20·6 Q/ha. (iii) Main effect of S alone is highly significant. (iv) Av. yield of fodder in Q/ha.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>S₆</th>
<th>S₇</th>
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<td>200·5</td>
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<tr>
<td>N₁</td>
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<td>218·9</td>
<td>124·8</td>
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<td>230·7</td>
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<tr>
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<td>237·5</td>
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<td>130·7</td>
<td>241·3</td>
<td>188·0</td>
<td>271·2</td>
<td>201·8</td>
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</table>

C.D. for S marginal means = 27·3 Q/ha.

63(32)
(i) 333·8 Q/ha. (ii) (a) 66·8 Q/ha. (b) 33·5 Q/ha. (iii) Main effects of S and N are highly significant. (iv) Av. yield of fodder in Q/ha.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>S₆</th>
<th>S₇</th>
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<td>N₁</td>
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<tr>
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<td>387·8</td>
<td>314·8</td>
<td>333·8</td>
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</table>

C.D. for S marginal means = 57·4 Q/ha.
C.D. for N marginal means = 17·8 Q/ha.

64(22)
(i) 385·5 Q/ha. (ii) (a) 54·1 Q/ha. (b) 47·2 Q/ha. (iii) Main effects of S and N are highly significant. (iv) Av. yield of fodder in Q/ha.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
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<td>408·4</td>
<td>250·6</td>
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</table>

C.D. for S marginal means = 46·4 Q/ha.
C.D. for N marginal means = 25·2 Q/ha.

Crop :- Opium (Rabi).
Site :- Govt. Agri. Res. Farm, Borkhera.
Object :- To find out optimum date of sowing with plant and row spacing.

Ref :- Rj. 61(98), 62(64).
Type :- 'C'.
1. BASAL CONDITIONS:

(i) Wheat—Fallow—Opium for 61(98) ; Opium—Fallow—Opium for 62(64). (b) Fallow. (c) N.A. (ii) Clay loam. (iii) As per treatments. (iv) (a) N.A. for 61(98) ; 1 disc, 2 ploughings and two bakherings for 62(64). (b) N.A. (c) 1 to 2 Kg/ha. (d) As per treatments. (e) N.A. (v) N.A. (vi) N.A. for 61(98) ; Local for 62(64). (vii) Irrigated. (viii) 3 weedings for 61(98) ; 2 weedings and 2 heeings for other. (ix) N.A. (x) N.A ; 14.2.63 to 23.3.1963.

2. TREATMENTS:

Main-plot treatments:

5 dates of sowing: \( D_1 =6\)th November, \( D_2 =16\)th November, \( D_3 =26\)th November, \( D_4 =6\)th December and \( D_5 =16\)th December.

Sub-plot treatments:

All combinations of (1) and (2)

(1) 3 spacings between rows: \( R_1 =15\) cm., \( R_2 =30\) cm. and \( R_3 =61\) cm.

(2) 3 spacings between plants: \( P_1 =8\) cm., \( P_2 =15\) cm. and \( P_3 =23\) cm.

3. DESIGN:

(i) Split-plot. (ii) (a) 5 main-plots replications ; 9 sub-plots/main-plot. (b) N.A. (iii) 3 for 61(98) 5 ; 2 for 62(64). (iv) (a) and (b) 2·4 m. x 1·8 m. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Effect of frost at early stages of growth and later growth suffered due to low temperature for 61(98); High temperature affected adversely the final extraction for 62(64). (ii) N.A. for 61(98) ; Blight incidence was controlled by spraying bordeaux mixture for 62(64). (iii) Yield of opium. (iv) (a) 1961—1962. (b) Nil. (v) and (vi) N.A. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS:

61(98)

(i) 17 Kg/ha. (ii) (a) 2·7 Kg/ha. (b) 1·8 Kg/ha. (iii) Main effects of D, R, P and interactions D \( \times \) R and R \( \times \) P are highly significant. Interaction D \( \times \) P is significant. (iv) Av. yield of opium in Kg/ha.

<table>
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<th>D_1</th>
<th>D_2</th>
<th>D_3</th>
<th>D_4</th>
<th>D_5</th>
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<td>8</td>
<td>5</td>
<td>19</td>
<td>13</td>
<td>17</td>
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</table>

C.D. for D marginal means =1·7 Kg/ha.
C.D. for R or P marginal means =0·8 Kg/ha.
C.D. for R or P means at the same level of D =1·7 Kg/ha.
C.D. for D means at the same level of R or P =2·2 Kg/ha.
C.D. for means in the body of \( R \times P \) table =1·3 Kg/ha.

62(64)

(i) 24 Kg/ha. (ii) (a) 2·9 Kg/ha. (b) 2·7 Kg/ha. (iii) All main effects and their interactions are highly significant. (iv) Av. yield of opium in Kg/ha.

\[\text{Table with data} \]
Crop :- Opium (Rabi).

Site :- Govt. Agri. Res. Farm, Borkhera.

Type :- ‘M’.

Object :- To study the effect of different levels of P and K along with different times of application of N on the yield of Opium

1. BASAL CONDITIONS:
(i) (a) Fallow-Wheat-Opium for 61(99) ; Opium-Fallow-Opium for other. (b) Wheat for 61(99) ; Fallow for 62(61). (c) 62 Kg/ha. of F.Y.M. for 61(99) ; N.A. for other. (ii) Clay loam. (iii) 19.11.1961 ; 7.11.1962. (iv) (a) 3 ploughings and 2 bakherings for 61(99) ; N.A. for 62(61). (b) N.A. (c) 2 Kg/ha. (d) 30 cm. x 15 cm. (e) N.A. (v) N.A. (vi) Local. (vii) Irrigated. (viii) 3 weedings for 61(99) ; 2 weedings and thinning for other. (ix) N.A. (x) N.A. ; 24.2.63 to 26.3.63.

2. TREATMENTS:
Main-plot treatments :
6 levels of N : N₀ =0, N₁ =22.4, N₂ =44.8, N₃ =67.2, N₄ =89.7 and N₅ =112.1 Kg/ha.
Sub-plot treatments :
3 split application of N : T₁ =2, T₂ =3 and T₃ =4 split application.
Sub-sub-plot treatments :
All combinations of (1) and (2)
(1) 3 levels of P : P₀ =0, P₁ =33.6 and P₂ =67.2 Kg/ha.
(2) 3 levels of K : K₀ =0, K₁ =33.6 and K₂ =67.2 Kg/ha.

3. DESIGN:
(i) Split-plot. (ii) (a) 6 main-plots/replication ; 3 sub-plots/main-plot ; 9 sub-sub-plots/sub-plot. (b) N.A. (iii) 2. (iv) 2.4 m. x 1.2 m. for 61(99) ; N.A. for other. (b) 2.4 m. x 1.2 m. (v) Nil for 61(99) ; N.A. for other. (vi) Yes.

4. GENERAL:
(i) Late sowing and water scarcity for 61(99) ; N.A. for other. (ii) Nil for 61(99) ; Resowing was done due to attack of blight for 62(61). (iii) Yield of opium. (iv) (a) 1961 to 1962. (b) N.A. (c) Nil. (v) and (vi) N.A. (vii) Since the sub-plot error variances are heterogeneous, results of individual years are presented under 5. Results.

5. RESULTS:
61(99)
(i) 10 Kg/ha. (ii) (a) 0 Kg/ha. (b) 1 Kg/ha. (c) 0 Kg/ha. (d) 4 Kg/ha. (e) N.A. (ii) Main effects of N, T, P, K and interactions P X K, T X P, T X K, N X K, N X P are highly significant. Interaction N X T is significant.

<table>
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<th></th>
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<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>D₅</th>
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</tr>
<tr>
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</table>

C.D. for D marginal means = 2.7 Kg/ha.
C.D. for P or R marginal means = 1.4 Kg/ha.
C.D. for P or R means at the same level of D = 3.2 Kg/ha.
C.D. for means in the body of P x R table = 2.5 Kg/ha.
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<td>9</td>
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<td>10</td>
<td>12</td>
<td>9</td>
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<td>10</td>
</tr>
</tbody>
</table>

C.D. for $N$ marginal means = 0.4 Kg/ha.
C.D. for $T$ marginal means = 0.3 Kg/ha.
C.D. for $P$ or $K$ marginal means = 0.3 Kg/ha.
C.D. for the means in the body of $P \times K$ table = 0.4 Kg/ha.
C.D. for $P$ or $K$ means at the same level of $N$ = 0.6 Kg/ha.
C.D. for $N$ means at the same level of $P$ or $K$ = 0.7 Kg/ha.
C.D. for $T$ means at the same level of $P$ or $K$ = 0.5 Kg/ha.
C.D. for $N$ means at the same level of $T$ = 0.8 Kg/ha.
C.D. for $T$ means at the same level of $N$ = 0.8 Kg/ha.

(i) 34 Kg/ha. (ii) (a) 2.2 Kg/ha. (b) 7.3 Kg/ha. (c) 3.7 Kg/ha. (iii) Main effects of $N$, $T$, $P$, $K$ and interactions $N \times P$, $N \times K$ and $T \times P$, $T \times K$ are highly significant. Interaction $P \times K$ is significant. (iv) Av. yield of opium in Kg/ha.

<table>
<thead>
<tr>
<th>$N_0$</th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$N_3$</th>
<th>$N_4$</th>
<th>$N_5$</th>
<th>$P_0$</th>
<th>$P_1$</th>
<th>$P_2$</th>
<th>$K_0$</th>
<th>$K_1$</th>
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<th>Mean</th>
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<tr>
<td>$T_1$</td>
<td>-</td>
<td>20</td>
<td>25</td>
<td>33</td>
<td>38</td>
<td>32</td>
<td>26</td>
<td>32</td>
<td>31</td>
<td>29</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>$T_2$</td>
<td>-</td>
<td>22</td>
<td>28</td>
<td>39</td>
<td>43</td>
<td>41</td>
<td>28</td>
<td>37</td>
<td>39</td>
<td>33</td>
<td>34</td>
<td>36</td>
</tr>
<tr>
<td>$T_3$</td>
<td>-</td>
<td>23</td>
<td>29</td>
<td>43</td>
<td>43</td>
<td>44</td>
<td>32</td>
<td>39</td>
<td>39</td>
<td>35</td>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>Mean</td>
<td>19</td>
<td>22</td>
<td>27</td>
<td>38</td>
<td>41</td>
<td>39</td>
<td>29</td>
<td>36</td>
<td>36</td>
<td>32</td>
<td>34</td>
<td>35</td>
</tr>
</tbody>
</table>

C.D. for $N$ marginal means = 1.1 Kg/ha.
C.D. for $T$ marginal means = 2.7 Kg/ha.
C.D. for $P$ or $K$ marginal means = 1.0 Kg/ha.
C.D. for means in the body of $P \times K$ table = 1.7 Kg/ha.
C.D. for $P$ or $K$ means at the same level of $T$ = 1.7 Kg/ha.
C.D. for $T$ means at the same level of $P$ or $K$ = 3.6 Kg/ha.
C.D. for $P$ or $K$ means at the same level of $N$ = 2.4 Kg/ha.
C.D. for $N$ means at the same level of $P$ or $K$ = 2.3 Kg/ha.
Crop: Opium (Rabi).

Site: Govt. Agri. Farm, Chittorgarh.

Object: To find out the optimum dose of chemical for the control of powdery mildew in Opium.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. 
   (ii) Clay loam. 
   (iii) 12.11.63. 
   (iv) (a) 2 ploughings and 4 plankings by bullocks, 2 discings by tractor disc harrow. 
   (b) Local method. 
   (c) 3 Kg/ha. 
   (d) and (e) N.A. 
   (v) 3 C.L./ha. of F.Y.M. by spreading and 185 Kg/ha. of N as A/S/N in three instalments by broadcasting. 
   (vi) Local. 
   (vii) Irrigated. 

2. TREATMENTS:
   6 concentrations of spersul sprays: 
   T₀ = Control, T₁=0·1%, T₂=0·2%, T₃=0·3%, T₄=0·4% and T₅=0·5%. 
   Sprays done fortnightly starting from 1.2.64.

3. DESIGN:
   (i) R.B.D. 
   (ii) (a) 6. (b) and (c) 11·0 m. x 5·5 m. 
   (iii) 5. 
   (iv) (a) 3·7 m. x 2·7 m. (b) 2·7 m. x 1·8 m. 
   (v) 46 cm. x 46 cm. 

4. GENERAL:
   (i) Good. 
   (ii) Incidence of powdery mildew; Control measures as per treatments. 
   (iii) Percentage of disease index. 
   (iv) 1963 only. 
   (b) No. (c) N.A. 
   (v) to (vii) Nil.

5. RESULTS:
   (i) 40·4 degrees. 
   (ii) 2·4 degrees. 
   (iii) Treatment differences are highly significant. 
   (iv) Av. disease index.

   Treatment | T₀ | T₁ | T₂ | T₃ | T₄ | T₅ |
   --- | --- | --- | --- | --- | --- | --- |
   Mean degrees | 45·7 | 41·3 | 40·1 | 37·0 | 39·3 | 39·2 |
   C.D. = 3·2 degrees.

Crop: Opium (Rabi).

Site: Govt. Agri. Farm, Chittorgarh.

Object: To find out optimum period of spraying for the control of powdery mildew disease in Opium.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. 
   (ii) Clay loam. 
   (iii) 12.11.63. 
   (iv) (a) 2 ploughings and plankings by bullocks and 2 discings by tractor disc harrow. 
   (b) Local method. 
   (c) 3 Kg/ha. 
   (d) and (e) N.A. 
   (v) 3 C.L./ha. of F.Y.M. by spreading and 185 Kg/ha. of N as A/S/N in three instalments by broadcasting. 
   (vi) Local. 
   (vii) Irrigated. 

2. TREATMENTS:
   16 applications of 5% spersul: 
   T₀=Control, T₁=3 fortnightly sprays starting from 22.2.64, T₂=3 fortnightly sprays starting from 29.2.64, T₃=3 fortnightly sprays starting from 7.3.64, T₄=2 fortnightly sprays starting from 22.2.64, T₅=2 fortnightly sprays starting from 29.2.64, T₆=2 fortnightly sprays starting from 7.3.64, T₇=2 fortnightly sprays starting from 14.3.64, T₈=1 application on 22.2.64, T₉=1 application on 29.2.64, T₁₀=1 application on 7.3.64, T₁₁=1 application on 14.3.64, T₁₂=1 application on 22.3.64, T₁₃=1 application on 29.3.64 and T₁₄=1 application on 5.4.64.

3. DESIGN:
   (i) B.I.B.D. 
   (ii) (a) 4 plots/block; 10 blocks. 
   (b) 14·6 m. x 2·7 m. 
   (iii) 5. 
   (iv) (a) 3·7 m. x 2·7 m. 
   (v) 46 cm. x 46 cm. 
   (vi) Yes.
4. GENERAL:
(i) Good. (ii) Incidence of powdery mildew; control measures as per treatments. (iii) Percentage of disease index. (iv) (a) 1963 only. (b) Nil. (c) Nil. (v) to (vii) Nil.

5. RESULTS:
(i) 41.2 degrees. (ii) 2.2 degrees. (iii) Treatment differences are highly significant. (iv) Av. disease index in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. disease index</td>
<td>53.9</td>
<td>41.5</td>
<td>40.7</td>
<td>39.8</td>
<td>39.7</td>
<td>38.7</td>
<td>39.4</td>
<td>41.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. disease index</td>
<td>40.2</td>
<td>39.6</td>
<td>40.1</td>
<td>40.1</td>
<td>40.1</td>
<td>41.1</td>
<td>41.3</td>
<td>41.8</td>
</tr>
</tbody>
</table>

C.D. = 2.9 degrees.

**Crop:** Opium (Rabi).

**Site:** Govt. Agri. Farm, Chittorgarh.

**Ref:** Rj. 63(92), Type: 'D'.

Object: To test the efficacy of different chemicals for the control of powdery mildew in Opium.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) Clay loam. (iii) 12.11.63. (iv) (a) 2 ploughings and 4 ploughings by bullocks and 2 discings by tractor disc harrow. (b) Local method. (c) 3 Kg/ha. (d) and (e) N.A. (v) 3 C.L. ha. of FYM by spreading and 185 Kg/ha. of N as A/S/N in 3 instalments by broadcasting. (vi) Local. (vii) Irrigated. (viii) 3 hand weedings. (ix) N.A. (x) Last week of April, 64.

2. TREATMENTS:
8 chemical treatments: T₀=Control, T₁=Spersul 0.5%, T₂= Gandhak ghol 0.5%, T₃=Thiovit 0.5%, T₄= Elosul 0.5%, T₅=W.P. Sulphur 0.5%, T₆=Karathane W.D. 0.2% and T₇=Sulphur dust at 22.4 Kg/ha.

2. DESIGN:
(i) R.B.D. (ii) (a) 8. (b) 14.6 m. x 5.5 m. (iii) 5. (iv) (a) 3.7 m. x 2.7 m. (b) 2.7 m. x 1.8 m. (v) 46 cm. x 46 cm. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Incidence of powdery mildew; control measures as per treatments. (iii) Percentage of disease index. (iv) (a) 1963 only. (b) No. (c) N.A. (v) to (vii) Nil.

5. RESULTS:
(i) 39.7 degrees. (ii) 2.0 degrees. (iii) Treatment differences are highly significant. (iv) Av. disease index in degrees.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T0</th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
<th>T5</th>
<th>T6</th>
<th>T7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. disease index</td>
<td>50.9</td>
<td>38.0</td>
<td>39.1</td>
<td>38.5</td>
<td>35.1</td>
<td>40.8</td>
<td>37.0</td>
<td>38.5</td>
</tr>
</tbody>
</table>

C.D. = 2.5 degrees.
Crop :- Bajra + Pulses (Kharif).
Site :- Govt. Agri. Farm, Bassi.
Object :- To find out the economics of mixed cropping of Bajra with Pulses.

1. BASAL CONDITIONS :
(i) (a) Fallow-Bajra. (b) Fallow. (c) Nil. (ii) N.A. (iii) 12.7.1960; 14.7.1961. (iv) (a) 2 ploughings. (b) and (c) N.A. (d) 30 cm. between rows for Bajra and 61 cm. between rows for pulses. (e) N.A. (v) N.A. (vi) Bajra : R.S.J.; Pulses : Local. (vii) Unirrigated. (viii) One weeding. (ix) N.A. (x) September, 1960; 24.10.1961.

2. TREATMENTS :
12 mixed cropping treatments : T_1 = Bajra alone, T_2 = Moong alone, T_3 = Guar alone, T_4 = Bajra and Moong mixed in the ratio of 1 : 1, T_5 = Bajra and Guar in alternate rows, T_6 = 4 rows of Bajra after every four rows of Moong, T_7 = 4 rows of Bajra after every four rows of Guar, T_8 = 4 rows of Bajra, Moong and Guar in alternate rows and T_9 = 4 rows of Bajra, Moong and Guar respectively.

3. DESIGN :
(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 8'5 m. x 5'8 m. (b) 7'9 m. x 5'2 m. (v) 30 cm. x 30 cm. (vi) Yes.

4. GENERAL :
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1960 to 1961. (b) N.A. (c) Results of combined analysis are given under 5. (v) and (vi) N.A. (vii) Error variances are homogeneous and Treatments x years interaction is present.

5. RESULTS :
(i) 292.8 Rs/ha. (ii) 112.7 Rs/ha. [based on 11 d.f. made up of Treatments x years interaction]. (iii) Treatment differences are significant. (iv) Av. money value in Rs/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T_1</th>
<th>T_2</th>
<th>T_3</th>
<th>T_4</th>
<th>T_5</th>
<th>T_6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. money value</td>
<td>316/6</td>
<td>97/5</td>
<td>260/1</td>
<td>315/8</td>
<td>381/3</td>
<td>293/7</td>
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<tr>
<td>T_7</td>
<td>T_8</td>
<td>T_9</td>
<td>T_10</td>
<td>T_11</td>
<td>T_12</td>
<td></td>
</tr>
<tr>
<td>357/6</td>
<td>260/0</td>
<td>353/8</td>
<td>335/7</td>
<td>310/5</td>
<td>231/3</td>
<td></td>
</tr>
<tr>
<td>C.D.=123/9 Rs/ha.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Crop :- Bajra and Pulses (Kharif).
Site :- Govt. Agri. Farm, Durgapura.
Object :- To find out the economics of pure and mixed sowing of Bajra and Pulses.

1. BASAL CONDITIONS :
(i) (a) Bajra-Fallow. (b) Fallow. (c) Nil. (ii) N.A. (iii) July 1960; July 1961. (iv) (a) 3 ploughings. (b) and (c) N.A. (d) 30 cm. between rows for Bajra and 61 cm. between rows for Pulses. (e) N.A. (v) N.A. (vi) R.S.K. for 60(70); Bajra-R.S.J. and Pulses : Local for 61(71). (vii) Nil. (viii) 1 weeding. (ix) N.A. (x) Sept. 1960; Sept. 1961.

2. TREATMENTS :
12 mixed cropping treatments : T_1 = Bajra alone, T_2 = Moong alone, T_3 = Cowpea, T_4 = Bajra and Moong mixed in 1 : 1 ratio, T_5 = Bajra and Cowpea mixed in 1 : 1 ratio, T_6 = Bajra and Moong in alternate rows, T_7 = Bajra, Moong and Cowpea in alternate rows, T_8 = 4 rows of Bajra and Moong respectively, T_9 = 4 rows of Bajra and Cowpeas respectively, T_10 = 4 rows of Bajra, Moong and Cowpeas respectively.
3. DESIGN and 4. GENERAL:

Same as in expt. Nos. 60(69), 61(72) conducted at Bassi on page 385.

5. RESULTS:

(i) 168·2 Rs./ha. (ii) 107·1 Rs/ha. [based on 11 d.f. made up of Treatments×years interaction]. (iii) Treatment differences are not significant. (iv) Av. value of produce in Rs/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
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<tbody>
<tr>
<td>Av. value of produce</td>
<td>228·5</td>
<td>68·2</td>
<td>78·3</td>
<td>196·8</td>
<td>250·6</td>
<td>167·3</td>
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<td>$T_7$</td>
<td>$T_8$</td>
<td>$T_9$</td>
<td>$T_{10}$</td>
<td>$T_{11}$</td>
<td>$T_{12}$</td>
<td></td>
</tr>
<tr>
<td>Av. value of produce</td>
<td>156·5</td>
<td>153·5</td>
<td>183·7</td>
<td>217·9</td>
<td>194·5</td>
<td>123·1</td>
</tr>
</tbody>
</table>

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**Crop**: Bajra and Pulses *(Kharif)*.

**Site**: Govt. Agri. Farm, Mandore.

**Object**: To study the economics of sowing Bajra and Pulses as pure and mixed crop.

---

1. BASAL CONDITIONS:

(i) (a) Bajra-Fallow. (b) Fallow. (c) Nil. (ii) N.A. (iii) 26.7.61. (iv) (a) 3 ploughings. (b) and (c) N.A. (d) Bajra 30 cm. between rows. Pulses 61 cm. between rows. (v) N.A. (vi) Bajra—R.S.K. (vii) Nil. (viii) 1 weeding. (ix) N.A. (x) 1.11.61.

2. TREATMENTS:

12 mixed cropping treatments: $T_1$=Bajra alone, $T_2$=Moong alone, $T_3$=Moth alone, $T_4$=Bajra and Moong mixed in 1 : 1 ratio, $T_5$=Bajra and Moth mixed in 1 : 1 ratio, $T_6$=Bajra and Moong in alternate rows, $T_7$=Bajra and Moth in alternate rows, $T_8$=4 rows of Bajra and Moong respectively, $T_9$=4 rows of Bajra and Moth respectively, $T_{10}$=Bajra, Moong and Moth mixed in 1 : 1 : 1 ratio, $T_{11}$=Bajra, Moong and Moth in alternate rows and $T_{12}$=4 rows of Bajra, Moong and Moth respectively.

---

3. DESIGN:

(i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 8·5 m.×5·8 m. (b) 7·9 m.×5·2 m. (v) 30 cm.×30 cm. (vi) Yes.

4. GENERAL

(i) and (ii) N.A. (iii) Grain seed. (iv) (a) 1961 only. (b) and (c) N.A. (v) to (vii) Nil.

5. RESULTS:

(i) 608·7 Rs./ha. (ii) 101·4 Rs/ha. (iii) Treatment differences are highly significant. (iv) Av. money value in Rs/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$T_1$</th>
<th>$T_2$</th>
<th>$T_3$</th>
<th>$T_4$</th>
<th>$T_5$</th>
<th>$T_6$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. money value</td>
<td>678·9</td>
<td>173·5</td>
<td>93·8</td>
<td>853·0</td>
<td>749·5</td>
<td>641·1</td>
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<tr>
<td>$T_7$</td>
<td>$T_8$</td>
<td>$T_9$</td>
<td>$T_{10}$</td>
<td>$T_{11}$</td>
<td>$T_{12}$</td>
<td></td>
</tr>
<tr>
<td>Av. money value</td>
<td>689·2</td>
<td>787·3</td>
<td>670·4</td>
<td>766·6</td>
<td>537·0</td>
<td>664·3</td>
</tr>
</tbody>
</table>

C.D.=146·0 Rs/ha.
Crop :- Wheat Gram (Rabi).


Ref :- Rj. 60(81).

Object :- To find out the economics of growing of legumes and cereal mixture under dry farming.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat+Gram. (c) Nil. (ii) Clay loam. (iii) 13.10.1960. (iv) (a) One ploughing and 4 bukherings. (b) Sowing behind the plough. (c) 67 Kg/ha. (d) 23 cm. x 30 cm. (e) N.A. (v) Nil. (vi) Malvi (Wheat). (vii) Unirrigated. (viii) Two weedings and two hoeings. (ix) and (x) N.A.

2. TREATMENTS :
   3 mixed cropping treatments : T₁=Wheat alone, T₂=Gram alone and T₃=Wheat and Gram mixed in 1 : 1 ratio.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 1/148 ha. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Yield of grain. (iv) (a) 1958 to 1962. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :
   (i) 530 Rs/ha. (ii) 190·38 Rs/ha. (iii) Treatment differences are significant. (iv) Av. money value in Rs/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. money value</td>
<td>457</td>
<td>499</td>
<td>634</td>
</tr>
<tr>
<td>C.D. = 204·2 Rs/ha.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat + Gram (Rabi).


Ref :- Rj. 61(120).

Object :- To study the yield of Wheat in pure and mixed conditions and in presence of legume in mixture.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) As per treatments. (c) Nil. (ii) Clay loam. (iii) 7.11.61. (iv) (a) Ploughing and bukhering. (b) Behind the plough. (c) 7 Kg/ha. (d) 23 cm. (e) N.A. (v) Ni. (vi) Wheat-Malvi, Gram-Local. (vii) Unirrigated. (viii) 2 weedings. (ix) 4 cm. (x) N.A.

2. TREATMENTS :
   3 mixed crop treatments : T₁=Pure Wheat, T₂=Pure Gram, and T₃=Mixture of Wheat and Gram in 1 : 1 ratio.

   (Alternate row of Wheat and Gram).

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 10·1 m. x 6·7 m. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Yield of grain and fodder. (iv) (a) 1958 to 1962. (b) Yes. (c) N.A. (v) to (vii) Nil.

5. RESULTS :
   (i) 348·0 Rs/ha. (ii) 140·8 Rs/ha. (iii) Treatment differences are significant. (iv) Av. money value in Rs/ha.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>T₁</th>
<th>T₂</th>
<th>T₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. money value</td>
<td>572</td>
<td>197</td>
<td>277</td>
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<td>C.D. = 151·0 Rs/ha.</td>
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Crop :- Cotton and Moth (*Khari*).  
Site :- Govt. Agri. Farm, Sriganganagar.

Object :- To study the beneficial effect of mixed cropping cotton with Moth in the control of root rat of Cotton.

1. **BASAL CONDITIONS:**  
   (i) (a) N.A. (b) Cotton. (c) N.A.  
   (ii) Sandy loam.  
   (iii) 14.6.60.  
   (iv) (a) 4 ploughings. (b) to (e) N.A.  
   (v) to (x) N.A.

2. **TREATMENTS:**  
   2 mixed cropping treatments : $T_1$ = Cotton mixed with Moth and $T_2$ = Pure Cotton.

3. **DESIGN:**  
   (i) R.B.D.  
   (ii) (a) 2. (b) N.A.  
   (iii) 12. (iv) (a) and (b) 5.5 m. x 3.7 m.  
   (v) Nil. (vi) Yes.

4. **GENERAL:**  
   (i) and (ii) N.A.  
   (iii) Yield of cotton.  
   (iv) (a) to (c) N.A.  
   (v) and (vi) Nil.  
   (vii) Results of cotton crop only available.

5. **RESULTS:**  
   (i) 1255 Kg/ha.  
   (ii) 266.0 Kg/ha. (iii) Treatment difference is not significant.  
   (iv) Av. yield of cotton in Kg/ha.

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