INSTITUTE OF AGRICULTURAL RESEARCH STATISTICS

NATIONAL INDEX

OF

AGRICULTURAL

FIELD

EXPERIMENTS

VOL. 6 PART 1

MADHYA PRADESH

1948–53

PUBLISHED BY

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

NEW DELHI
FOREWORD

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

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

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

A.D. PANDIT

Vice-President,

Indian Council of Agricultural Research.

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

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

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

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

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

The compendium is divided into 15 volumes each for (1) Andhra Pradesh (2) Assam, Manipur and Tripura (3) Bihar (4) Gujarat (5) Kerala (6) Madhya Pradesh (7) Madras (8) Maharashtra (9) Mysore (10) Orissa (11) Punjab, Jammu & Kashmir and Himachal Pradesh (12) Rajasthan (13) Uttar Pradesh (14) West Bengal and (15) all Central Institutes. In each volume back-ground information of the respective State regarding its physical features, soils, rainfall and climate, agricultural production and area under different crops is given. A map showing different regions of the State, soils and agricultural research farms is also included. The experiments reported in each volume have been arranged cropwise for each State. All the experiments belonging to a particular crop at various research stations are grouped together. For a particular crop, experiments are arranged according to the following classification:

Manurial (M), Cultural (C), Irrigational (I), Diseases, Pests and Chemicals other than fertilizers (D), Rotational (R), Mixed Cropping (X) and combinations of these wherever they occur (e.g., CM as Cultural-cum-Manurial). Experiments in which crop varieties also form a factor are denoted by adding V to their symbol and are given together (e.g., MV as Manurial-cum-Varietal). The results of an experiment are given along with other basic information such as rotation of crops followed, cultural practices adopted, etc.

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

This publication is the result of the co-operative endeavour of a large number of persons both at the Centre and in the States. I should particularly mention in this connection, guidance and help rendered in the formulation of the scheme by Dr. D.J. Finney F.R.S. of Aberdeen University, Scotland, during his stay at the Institute of Agricultural Research Statistics as an F.A.O. Statistical Expert in 1952-53.
At the Institute of Agricultural Research Statistics, the work under the scheme was carried out under the supervision and guidance of Shri T.P. Abraham, Assistant Statistical Adviser. Shri G.A. Kulkarni, Statistician, looked after the detailed working of the scheme. These officers have been largely responsible for the preparation of the manuscript of the compendium and it is a pleasure to thank them for the hard work they have put in for getting this compendium ready. Messrs O.P. Kathuria, B.V. Srikantiah, M.L. Salmi, B.P. Dyundi, S.D. Bal and P.K. Jain of the statistical staff of the Institute deserve special mention for their careful scrutiny of the data and preparation of the material for the compendium. Thanks are also due to Dr. Uttam Chand, Professor of Statistics, now with the Central Statistical Organisation, Shri K.S. Avadhany, Assistant Statistician, also now with the Central Statistical Organisation, and Shri K.C. Raut, Statistician in this office who were associated with the scheme in its initial stages.

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

New Delhi,
August 16, 1962.

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

<table>
<thead>
<tr>
<th>Region and headquarters</th>
<th>Regional Supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Andhra Pradesh (Hyderabad)</td>
<td>SHRI D.V.G. KRISHNAMOORTHY, Deputy Director of Food Production, Andhra Pradesh. SHRI JAGANNATH RAO, Joint Director of Agriculture (Research), Andhra Pradesh. DR. KHADRUDDIN KHAN, Joint Director of Agriculture (Research), Andhra Pradesh. DR. WAHUDDIN, Headquarters Deputy Director of Agriculture (Research), Andhra Pradesh.</td>
</tr>
<tr>
<td>2. Assam, Manipur and Tripura (Shillong)</td>
<td>SHRI L.K. HANDIQUE, Director of Agriculture, Assam. SHRI S. MAJID, Director of Agriculture Assam. DR. S.R. BAROOHA, Director of Agriculture, Assam.</td>
</tr>
<tr>
<td>3. Bihar (Sabour)</td>
<td>DR. R. RICHARIA, Principal, Agriculture College, Sabour. SHRI R.S. ROY, Principal, Agriculture College, Sabour.</td>
</tr>
<tr>
<td>4. Kerala (Trivandrum)</td>
<td>SHRI N. SHANKARA MENON, Director of Agriculture, Kerala. SHRI P.D. NAIR, Director of Agriculture, Kerala.</td>
</tr>
<tr>
<td>5. Madhya Pradesh (Gwalior)</td>
<td>DR. T.R. MEHTA, Principal, Agriculture College, Gwalior.</td>
</tr>
<tr>
<td>6. Madras (Coimbatore)</td>
<td>SHRI C.R. SHESHADEH, Vice-Principal &amp; Secretary, Research Council, Agriculture College, Coimbatore. SHRI P.A. VENKATESWARAN, Vice-Principal &amp; Secretary, Research Council, Agriculture College, Coimbatore. LATE SHRI M. BHAVANI SANKARA RAO, Vice-Principal &amp; Secretary, Research Council, Agriculture College, Coimbatore. SHRI T. NATARAJAN, Agronomist &amp; Secretary, Research Council, Agriculture College, Coimbatore. SHRI A.H. SARMA, Extension Specialist &amp; Secretary, Research Council, Agriculture College, Coimbatore.</td>
</tr>
<tr>
<td>7. Maharashtra &amp; Gujarat (Former Bombay State)</td>
<td>SHRI D.S. RANGA RAO, Statistician, Department of Agriculture, Poona.</td>
</tr>
</tbody>
</table>

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

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

10. Punjab, Jammu & Kashmir and Himachal Pradesh (Chandigarh)  
Shri P.S. Sahota, Statistician, Department of Agriculture, Punjab.

11. Rajasthan (Jaipur)  
Shri H.C. Kothari, Statistician, Department of Agriculture, Rajasthan.

12. Uttar Pradesh (Lucknow)  
Dr. K. Kishen, Chief Statistician to Govt. of U.P. Department of Agriculture, U.P.

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

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

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

Abbreviations adopted for States are as follows :-

<table>
<thead>
<tr>
<th>State</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.P.</td>
<td>Andhra Pradesh</td>
</tr>
<tr>
<td>As.</td>
<td>Assam</td>
</tr>
<tr>
<td>Bl.</td>
<td>Bihar</td>
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<tr>
<td>Di.</td>
<td>Delhi</td>
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<tr>
<td>Gj.</td>
<td>Gujarat</td>
</tr>
<tr>
<td>H.P.</td>
<td>Himachal Pradesh</td>
</tr>
<tr>
<td>J.K.</td>
<td>Jammu &amp; Kashmir</td>
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<tr>
<td>K.</td>
<td>Kerala</td>
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<tr>
<td>M.</td>
<td>Madras</td>
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<tr>
<td>Mn.</td>
<td>Manipur</td>
</tr>
<tr>
<td>Mh.</td>
<td>Maharashtra</td>
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<tr>
<td>Ms.</td>
<td>Mysore</td>
</tr>
<tr>
<td>M.P.</td>
<td>Madhya Pradesh</td>
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<tr>
<td>Or.</td>
<td>Orissa</td>
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<tr>
<td>Pb.</td>
<td>Punjab</td>
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<tr>
<td>Rj.</td>
<td>Rajasthan</td>
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<td>Tr.</td>
<td>Tripura</td>
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<tr>
<td>U.P.</td>
<td>Uttar Pradesh</td>
</tr>
<tr>
<td>W.B.</td>
<td>West Bengal</td>
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</tbody>
</table>

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

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

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

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

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

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

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

Abbreviations used in the text of the experiments :-

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ac.</td>
<td>acre</td>
</tr>
<tr>
<td>Ammo.</td>
<td>Ammonium Phosphate</td>
</tr>
<tr>
<td>A/N</td>
<td>Ammonium Nitrate</td>
</tr>
<tr>
<td>A/S</td>
<td>Ammonium Sulphate</td>
</tr>
<tr>
<td>B.D.</td>
<td>Basal Dressing</td>
</tr>
<tr>
<td>B.M.</td>
<td>Bone Meal</td>
</tr>
<tr>
<td>G.L.</td>
<td>Cart load</td>
</tr>
<tr>
<td>C.M.</td>
<td>Cattle Manure</td>
</tr>
<tr>
<td>C/N</td>
<td>Chilean Nitrate</td>
</tr>
<tr>
<td>G/S</td>
<td>Copper Sulphate</td>
</tr>
<tr>
<td>F.M.</td>
<td>Fish Meal or Fish Manure</td>
</tr>
<tr>
<td>F.W.C.</td>
<td>Farm Waste Compost</td>
</tr>
</tbody>
</table>
lb.—Pounds.  Super—Super Phosphate.
M.C.—Municipal Compost.  T.C. —Town compost.
Mur Pot.—Muriate of Potash.  Zn. Sul.—Zinc Sulphate.

BASAL CONDITIONS

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

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

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

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

DESIGN

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

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

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

C. For experiments on cultivators' fields:
   (i) Method of selection of experimental sites.  (ii) No. and distribution of experiments.  (iii) Plot size.  (a) Gross. (b) Net.  (iv) Whether treatments are randomised.
GENERAL

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

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

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

C. For experiments on cultivators' fields:
   (i) Crop condition during growth. (ii) Incidence of pests and diseases with control measures taken.
   (iii) Quantitative observations taken.
   (iv) In case of repetition in successive years, (a) from what year to what year, (b) whether treatments were assigned to the same plots in the same manner every year, (c) reference to combined analysis, if any. (v) In case of repetition in other places names of places along with reference. (vi) Abnormal occurrences, like heavy rains, frost, storm etc., if any. (vii) Any other important information.
<table>
<thead>
<tr>
<th>No.</th>
<th>Name of crops</th>
<th>Botanical name</th>
<th>Assamese</th>
<th>Bengali</th>
<th>Oriya</th>
<th>Telugu</th>
<th>Tamil</th>
<th>Malayalam</th>
<th>Kannada</th>
<th>Marathi</th>
<th>Gujarati</th>
<th>Hindi</th>
<th>Punjabi</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paddy</td>
<td>Oryza sativa L.</td>
<td>Dhan</td>
<td>Dhan</td>
<td>Dhan</td>
<td>Nadlu</td>
<td>Bhatta</td>
<td>Bhatt</td>
<td>Dhan</td>
<td>Dhan</td>
<td>Chau; Dhan</td>
<td>Dhan</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Wheat</td>
<td>Triticum Sativum</td>
<td>Gaum</td>
<td>Gam</td>
<td>Gaam</td>
<td>Godumal</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>3</td>
<td>Jowar</td>
<td>Andropogon 8crophum</td>
<td>—</td>
<td>Jowar</td>
<td>Jowra</td>
<td>Uraha</td>
<td>Jutra</td>
<td>Jowari</td>
<td>Jowari</td>
<td>Jowari</td>
<td>Jowar</td>
<td>Jowar</td>
<td>Jowar</td>
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<tr>
<td>4</td>
<td>Bajra</td>
<td>Pennisetum typhoides</td>
<td>Bajra</td>
<td>Bajra</td>
<td>Bajra</td>
<td>Bajur</td>
<td>Bajla</td>
<td>Bajura</td>
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<td>Bajura</td>
<td>Bajura</td>
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<tr>
<td>5</td>
<td>Kodon</td>
<td>Passchelum scrobiculatum L.</td>
<td>Kodon</td>
<td>Kodon</td>
<td>Kodon</td>
<td>Varagu</td>
<td>Varagu</td>
<td>Varagu</td>
<td>Kodra</td>
<td>Kodra</td>
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<tr>
<td>6</td>
<td>Kulli</td>
<td>Panicum millare L.</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Samai</td>
<td>Same</td>
<td>—</td>
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<tr>
<td>7</td>
<td>Potato</td>
<td>Solanum tuberosum L.</td>
<td>Aloo</td>
<td>Bilat</td>
<td>Bilat</td>
<td>Urodhi</td>
<td>Uredhi</td>
<td>Uredhi</td>
<td>Aalu</td>
<td>Aalu</td>
<td>Aalu</td>
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<td>8</td>
<td>Tur</td>
<td>Cajanus cajan</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Uroha</td>
<td>Uroha</td>
<td>Uroha</td>
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<tr>
<td>9</td>
<td>Moong</td>
<td>Phaseolus aureus</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>Uruzh</td>
<td>Uruzh</td>
<td>Uruzh</td>
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<tr>
<td>10</td>
<td>Massor</td>
<td>Lens esculenta</td>
<td>—</td>
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<tr>
<td>11</td>
<td>Gram</td>
<td>Cicer arietinum L.</td>
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<tr>
<td>12</td>
<td>Cotton</td>
<td>Gossypium hirsutum</td>
<td>—</td>
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<tr>
<td>13</td>
<td>Sugarcane</td>
<td>Saccharum officinarum L.</td>
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<tr>
<td>14</td>
<td>Linseed</td>
<td>Linum usitatissimum L.</td>
<td>—</td>
<td>—</td>
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<tr>
<td>15</td>
<td>Groundnut</td>
<td>Arachis hypogaea L.</td>
<td>—</td>
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</tbody>
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GLOSSARY OF VERNACULAR NAMES OF CROPS
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STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
EXPERIMENTAL RESULTS

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<tr>
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<tbody>
<tr>
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<td>82</td>
</tr>
<tr>
<td>Jowar</td>
<td>209</td>
</tr>
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<td>Bajra</td>
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<td>Kodon</td>
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<td>235</td>
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<td>247</td>
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<tr>
<td>Cotton</td>
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(*Simple experiments on cultivator’s fields (T.C.M.) are given from page 167—176)
MAP OF MADHYA PRADESH SHOWING AGRO-CLIMATIC REGIONS, SOILS, AGRICULTURAL RESEARCH STATIONS ETC.
1. GENERAL

The new State of Madhya Pradesh is formed of the Maha Koshal Unit of the former Madhya Pradesh State, the whole of the former states of Vindhya Pradesh and Bhopal, the whole of Madhya Bharat State excluding Sunel enclave of the Mandsaur district (which has gone to Rajasthan State) and the Sirnoj sub-division of Kota district of Rajasthan. It is divided into seven commissionerships viz., Gwalior, Indore, Bhopal, Jabalpore, Rewa, Bilaspur and Raipur with headquarters at the cities or towns with the same names.

The state is centrally situated between the latitudes 17°48' N and 26°52' N and between the longitudes 74°2' E and 84°24' E. It is divided into 43 districts for administrative purposes.

The total area of the state is about 109.6 million acres. Nearly 35% of the area of the state is cultivated (net area sown) and about 33.7% of the area is under food crops.

2. PHYSICAL FEATURES

The main physical features of the state are the Northern Region, the Malwa Plateau, the Narmada valley, the Satpura range and the Chattisgarh plains.

The Northern Region comprises of low lying areas around Gwalior and to the north-east of it, extending thence into Bundelkhand of which it includes the greater part till it meets the Kymore hills in Bhagelkhand. The area of the tract is about 18,870 sq. miles.

The Plateau takes in most of Malwa, the wide table land, with a mean elevation of 1,600 feet above the sea, and has an area of about 34,600 sq. miles. It includes all the country lying between the great Vindhyan barrier which forms the northern part of Narmada valley and the point just south of Gwalior.

The Narmada Valley is a long narrow strip along the Narmada, walled in by Vindhyanas and the Satpuras to North and South, respectively and extending to a length of 200 miles from Jabalpur to Hemidia with an average width of 20 miles.

South of Narmada Valley, the Satpuras stretch across the state in the shape of a large triangle, its eastern face extending to 100 miles from Amarkantak to Saetkedi in Balaghat district and its sides running west wards for about 400 miles and meeting gradually in Nimar. The general elevation of Satpura range is 2,000 feet but several of its peaks rise to 3,500 feet, and few to more than 4,000 feet. The Satpuras form the west watershed of the plains lying north and south of them.

Extending along the eastern face of Satpura range lie the Chattisgarh plains. Except for a few undulations, the level of the plains is generally unbroken.

The Vindhyanas and Satpuras are the two parallel mountain ranges running west to east through the middle of the state. The main rivers are the Chambal, Betwa, Sone, Narmada, Tapi, Mahanadi and Indravati.

3. SOIL TYPES

The main soil types found in Madhya Pradesh are alluvial, deep black, medium black, shallow or light black, mixed red and black, mixed red and yellow and sandy, or gravelly.

The fertile alluvial soil well supplied with potash and lime but poor in phosphoric acid, nitrogen and humus, is capable of growing a variety of crops such as rice, wheat
and sugarcane. It is found in Morena, Bhind and Gwalior. The soil of Sheopur (Morena district) is black in colour, clay in texture, low in soluble salts, neutral in reaction and have a layer of calcium carbonate at a depth of two to four feet. The soil of Jorsa (Morena district) is yellowish brown and less clayey while that of Bhind is yellow in colour and lighter in texture. In Gohad (Bhind district) saline and alkaline patches have developed due to improper drainage.

The black soil occupies almost half of the state and mainly covers the area of Malwa Plateau, Narmada Valley and Satpura ridge. It varies in depths from a couple of feet to several feet and is usually loamy to clayey in texture. Lime concretion zone and free calcium carbonate are invariably present at different depths. Cracks develop in summer season and in deep clayey soil, they are even three to four feet deep. This soil is usually ill supplied with phosphate, nitrogen and organic matter but is generally sufficient in potash and lime and is suitable for cotton cultivation though other crops like jowar, wheat, sugarcane, groundnut etc. also grow well. This soil has three sub-types a) deep black soil (b) medium black soil and (c) shallow black soil.

(a) The deep black soil covers major part of Narmada Valley and open level portions of Vindhyavas and Satpura plateau especially the areas of Hoskanganj and Narindhurpur districts. This soil has been further subdivided as black, dark brown, brown, mixed and sandy. The black soil is very good for wheat and a variety of other crops, while others are somewhat poor. The clay percentage in these soils varies from 20 to 60.

(b) Medium black soil is the largest in the group of black soils and covers the major portion of Malwa plateau including districts of Sidhi, Shahdol, Jabalpur, Dabra, Sagar, East Nimar, Raisen and Sehore and Southern part of Shivpuri district. This soil is not very deep and is suitable for most of the crops especially wheat, cotton, sugarcane, jowar, groundnut etc. The soil of Jabalpur, Sagar, Mandai and Shivpuri districts contain 20 to 40 percent clay while in Bhiwadi, Guna, Dhar, Ujjain and Dewas district the percentage of clay varies from 30 to 50.

(c) Shallow black soil is primarily spread over the region of Satpura ridge and covers Seoni, Chhindwara and Betul districts. It consists of shallow loams having clay percentage of 15 to 30. The important types found are dark brown, clay and loamy rice soil, black soil and poor light hilly soil.

Mixed red and black soil is prevalent in eastern part of the Cild region and Rewa, Satna, Panna, Chattarpur, Tikamgarh and Datia districts and a part of Shivpuri district. The major characteristics of the red soil are light texture, absence of lime concretions and free carbonates. The commonest form of this soil is sand and it differs greatly in depth and fertility and produces large varieties of crops under irrigation. It is generally deficient in nitrogen, phosphoric acid, organic matter and lime.

Red and yellow soil is found in the Chhatarpur plains and includes the Balaghat district and part of Raigarh, Surguja and Bastar districts. Mixed red and yellow soil occurs in this area, which is mostly suited for rice crop. The soil is generally light and sandy, though the medium and heavy varieties are also found. Calcium is usually present in the exchangeable form and it is poor in phosphoric acid, humus and nitrogen.

In Durg, Bilaspur and Balaghat districts, deep clay soil with line stones, yellow sandy soil and mixture of these two with a medium texture predominates. In Rajpur district, red and stony poor soil is also found, while in Balaghat district dark alluvium covers the area round about the rivers.

Skeletal or gravelly soil consists of stony uplands of the Vindhyavas and Satpura ranges and covers part of Shahdol, Muxila, Surguja, Raigarh, Bastar and Jabalpur districts. It usually grows inferior millets and oilseeds. Generally it is poor, though some patches of good black soil are also found where crops like rice, wheat etc. are grown.
4. CLIMATE AND RAINFALL

The climate of the state is dry in the north, cool and breezy in Malwa plateau and generally wet and humid in the eastern and southern parts.

A large part of Madhya Pradesh receives rainfall between 30 to 60 inches. It is only in Bastar, Surguja and Balaghat districts that the amount of rainfall exceeds 60 inches. The northern districts of Morena, Bhind, Gwalior and Datia form the dry zone receiving less than 30 inches of rainfall.

Seasonwise normal rainfall for different regions of the state is given in Table 1.

### TABLE 1

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dry (Gwalior, Morena, Bhind and Datia)</td>
<td>30.00</td>
<td>0.75</td>
<td>-</td>
<td>0.51</td>
<td>31.26</td>
</tr>
<tr>
<td>2</td>
<td>Middle (all districts excluding the dry and wet regions)</td>
<td>39.72</td>
<td>2.60</td>
<td>0.20</td>
<td>1.30</td>
<td>43.82</td>
</tr>
<tr>
<td>3</td>
<td>Wet (Bastar, Surguja Raigarh and Balaghat)</td>
<td>56.06</td>
<td>3.77</td>
<td>0.33</td>
<td>2.53</td>
<td>62.69</td>
</tr>
</tbody>
</table>

State (simple average) | 41.93 | 2.38 | 0.17 | 1.45 | 45.93 |

5. IRRIGATION

The total area under wet cultivation i.e. net irrigated area is about 2 million acres or 2% of the total area of the state. The area figures irrigated by various sources are given below.

### TABLE 2

<table>
<thead>
<tr>
<th>Source</th>
<th>Area (in lakh acres)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Canals</td>
<td>9.65</td>
<td>47.1</td>
</tr>
<tr>
<td>2. Wells</td>
<td>7.27</td>
<td>35.5</td>
</tr>
<tr>
<td>3. Tanks</td>
<td>2.70</td>
<td>13.2</td>
</tr>
<tr>
<td>4. Other sources</td>
<td>0.87</td>
<td>4.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20.49</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Balaghat district has the largest irrigated area followed by Tikamgarh, Gwalior, Raipur, Chattarpur, Shivpuri, Bilaspur, Bhind, Durg, Mandsaur, Seoni and Betu. At other end are the districts of Vidisha (Bhilsa), Scindia, Rewa, Satna, Sidhi and Shahdol where little irrigation is practised.

Among the sources of irrigation, canals account for the largest share of irrigated area, although the contribution of wells is not much below that of canals. Tanks and other sources hardly account for one-fifth of the total irrigated area in the state.

6. AGRICULTURAL PRODUCTION AND NORMAL CROPPING PATTERN

Madhya Pradesh is generally regarded to comprise of three crop zones, viz. rice, zone, wheat zone and jawar zone, the last one also being known as the cotton-jawar zone, because the major jawar growing districts also grow cotton.
Some of the districts are, however, major with regard to more than one crop. Thus districts of Panna, Satna, Rewa, Jabalpur and Seoni are major with regard to the areas of both rice and wheat. Similarly the districts of Morena, Bhind, Gwalior, Datia, Shivar and Guna are major from the viewpoint of the area of both jowar and wheat.

The state can be distinctly divided into the following crop zones:

- **Rice zone**
  - Districts included: Sidhi, Sahrndol, Surenja, Mandla, Bilaspur, Raigarh, Balaghat, Raipur and Bastar.

- **Wheat zone**
  - Districts: Vidisha (Bhilai), Sagar, Darnoh, Selore, Hoshangabad and Narsinhpur.

- **Rice-wheat zone**
  - Districts: Panna, Satna, Rewa, Jabalpur and Seoni.

- **Cotton-jowar zone**
  - Districts: Mandla, Kailam, Raigarh, Ujjain, Shajapur, Jabalpur, Dhar, Indore, West Nimar and East Nimar.

- **Jowar-wheat zone**
  - Districts: Morena, Bhind, Gwalior, Datia, Shivar, Guna, Tikamgarh, Chhatarpur, Betul and Chhindwara.

The table below gives the acreage under different crops, production and average yield per acre.

### TABLE 3

<table>
<thead>
<tr>
<th>Crop</th>
<th>Area (acres in lakh)</th>
<th>Production (lakh tons)</th>
<th>Yield/acre (lb/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rice</td>
<td>96.2</td>
<td>32.64</td>
<td>760</td>
</tr>
<tr>
<td>2. Jowar</td>
<td>40.63</td>
<td>10.82</td>
<td>597</td>
</tr>
<tr>
<td>3. Wheat</td>
<td>30.09</td>
<td>17.03</td>
<td>476</td>
</tr>
<tr>
<td>4. Bajra</td>
<td>4.25</td>
<td>0.89</td>
<td>471</td>
</tr>
<tr>
<td>5. Maize</td>
<td>10.64</td>
<td>1.88</td>
<td>595</td>
</tr>
<tr>
<td>6. Barley</td>
<td>5.09</td>
<td>1.31</td>
<td>578</td>
</tr>
<tr>
<td>7. Gram</td>
<td>38.09</td>
<td>9.91</td>
<td>583</td>
</tr>
<tr>
<td></td>
<td></td>
<td>46.97</td>
<td></td>
</tr>
</tbody>
</table>
| 8. 
  9. Groundnut | 8.22                 | 1.98                   | 539                  |
| 10. Sesamum  | 7.94                 | 0.66                   | 188                  |
| 11. Linseed  | 17.14                | 1.30                   | 170                  |
| 12. Cotton   | 18.98                | 5.69 (bales)           | 353                  |
| 13. Sugarcane| 1.31                 | 1.67 (gur)             | --                   |

### 7. CROP ROTATIONS

In northern and central regions of the state the wheat crop is usually rotated with a leguminous crop like Udid, Moong or Groundnut (early variety). In a two year rotation wheat is taken after jowar or bajra mixed with Arhar and rotated with gram. The following are the rotations followed.

1. **Northern region**:
   - (i) Udid/Moong/Groundnut (early variety) — Wheat.
   - (ii) Jowar/Bajra mixed with Arhar or rotated with gram — Wheat (2 years).
   - (iii) Rice — Pea + Gram manuring — Wheat (2 years).
   - (iv) Cotton — Arhar mixed — Fallow — Wheat (2 years).

2. **Eastern region**:
   - (i) Rice or Maize — Gram or Pea — Fallow — Wheat (2 years).
   - (ii) Rice — Wheat (under irrigation).
   - (iii) Arhar mixed with Til — Fallow — Wheat (2 years).

3. **Central Region**:
   - (i) Udid/Moong/Groundnut(G.M.) — Fallow — Wheat.
(ii) Jowar mixed with Arhar or rotated with gram or cotton mixed with Arhar—Fallow—Wheat (2 years).

(iii) Rice—Wheat alone or mixed with gram.

4. Southern Region:

(i) Groundnut—cotton mixed, or Jowar mixed with Arhar or Jowar rotated with gram or Arhar with cotton—Fallow—Wheat (2 years).

(ii) Rice—Wheat alone or mixed with gram.

(iii) Cotton in 1st year with fallow in 2nd year—Wheat.

8. AGRICULTURAL RESEARCH AND RESEARCH STATIONS

The agricultural research in the state consists of botanical research on various crops like wheat, rice, pulses, Jowar and groundnut. The research on agronomic problems is carried out in all parts of the State. Research on wheat is concentrated at Powerkheda in wheat zone. The Institute of Plant Industry, Indore which represents cotton/Jowar zone, now taken over by the State Government, carries out research mainly on cotton and wheat. Research on paddy is mainly carried out at Raipur-Labhandi farm, and also at Jabalpur-Adarthal farm, which fall in the rice zone and rice—wheat zone respectively. It may be mentioned here that in Madhya Pradesh State the research to evolve out better varieties of cotton and wheat has received much more attention than any other problems.

There were in all 20 research farms which reported the experiments for the period 1948-53. The central farm and Institute of Plant Industry, Indore, reported highest number of experiments. Out of 144 experiments (nearly ¼ of the total) reported from this farm there were 31 experiments on wheat and 59 on cotton. The next in order was Adarthal farm, Jabalpur which reported 52 experiments, out of which 24 were on paddy and 30 on wheat. Labhandi farm, Raipur also reported 47 experiments out of which 24 were on wheat. The farms at Powerkheda had 49 experiments out of which 38 experiments were on paddy. The table showing details of agricultural research station is attached.

9. EXPERIMENTS

There were in all 453 experiments available for the period 1948-53 distributed over various crops. The distribution of experiments according to crops and treatments tri. ed is given in table 4 below.

<table>
<thead>
<tr>
<th>Paddy</th>
<th>80</th>
<th>MV</th>
<th>12</th>
<th>C</th>
<th>2</th>
<th>CV</th>
<th>6</th>
<th>CM</th>
<th>CMV</th>
<th>1</th>
<th>DHM</th>
<th>7</th>
<th>D</th>
<th>2</th>
<th>V</th>
<th>3</th>
<th>Total</th>
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<td>Wheat</td>
<td>119</td>
<td>-</td>
<td>18</td>
<td>8</td>
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<td>4</td>
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<td>Mixed Cropping</td>
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<td>10</td>
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<tr>
<td>Rotational</td>
<td>-</td>
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<td>4</td>
</tr>
</tbody>
</table>

**Table 4. Statement showing distribution of experiments according to crops and treatments tried**

Total: 318 7 48 11 24 4 20 2 3 19
It may be seen from the table that nearly 41% of the total number of experiments were on Wheat which is one of the principal food crops of Madhya Pradesh occupying nearly 8 million acres. Paddy which is also another important food crop occupying nearly 10 million acres has nearly half the number of experiments of that carried out on wheat.

Among the cash crops cotton has the highest number of experiments.

In most of the manurial experiments on wheat and paddy the treatments were usually Ammonium Sulphate, and Ammonium Sulphate + Groundnut cake mixed in equal ratio to supply nitrogen at the rate of 10 lb./ac. to 40 lb./ac., and also super phosphate to supply P₂O₅ at the same rate. There were few experiments at various places on wheat and paddy to compare the relative merits of Town Compost, Farm Yard Manure, Groundnut cake and Ammonium Sulphate applied to give 20 lb./ac. and 40 lb./ac. of nitrogen. In such experiments the direct effects as well as the residual effects on the succeeding cereal crop were studied. There were very few experiments having green manure treatments, on both the crops. Sodium nitrate and lime also formed treatments in a few cases. In experiments where treatments were factorial combinations of the levels of nitrogen and P₂O₅ the levels of N and P₂O₅ varied at the same rate viz. from 0 to 40 lb./ac.

The designs most popularly used were Randomised blocks and factorial in randomised blocks. There were as many as 12 factorial experiments in randomised blocks. The number of plots per block varied from 2 to as many as 24 in both types. The number of replications varied from 2 to 6. The net plot size was usually 1/40th of an acre.

The split-plot designs accounted for only 10% of the total. These designs were adopted in both manurial and cultural experiments, and also in manurial-cum-cultural and varietal-cum-manurial experiments. In manurial experiments green manures were in main-plots and the fertilizers like AS and Super were in sub-plots. The number of replications in these designs were 4 to 6.

The experiments on cultivators' fields conducted under Stewart's scheme of the I.C.A.R. in Sehore district during 1953-54 on wheat are presented for different centres. The results of experiments conducted on cultivator's fields under T.C.M. trials are also given. The details of the T.C.M. trials are given in two reports published by I.C.A.R. (1955) on Paddy and Wheat.
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the Station</th>
<th>Soil type and soil analysis</th>
<th>Normal rainfall in inches (monthwise)</th>
<th>Irrigation facilities</th>
<th>No. of experiments</th>
<th>General description of the topography of the expl. area</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Baghrai :- Regional Res. Stn.</td>
<td>(1) Soil type :- Clayey loam.</td>
<td>June 1.96</td>
<td>Canal irrigation</td>
<td>Paddy 9</td>
<td>Practically all the farm land is levelled having a slight slope from north to south.</td>
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<td></td>
<td>Gird (Gwalior), 14 miles from Dabra central Rly. Stn.</td>
<td>(2) Depth :- 9'.</td>
<td>July 10.76</td>
<td>since beginning of</td>
<td>Wheat 4</td>
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<td>Year of est. :-1936. It represents canal irrigated tract having clayey loam soil.</td>
<td>(3) Colour :- Medium black.</td>
<td>Aug. 7.36</td>
<td>the Stn. No proper drainage system,</td>
<td>Sugarcane 2</td>
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<td></td>
<td>Major crops :- Paddy and Wheat.</td>
<td>(4) Structure :- N.A.</td>
<td>Sept. 8.75</td>
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<td>Soil analysis :-</td>
<td></td>
<td>Oct. 3.66</td>
<td></td>
<td>Total 15</td>
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<td></td>
<td>(i) Chemical analysis :-</td>
<td></td>
<td>Nov. and</td>
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<tr>
<td></td>
<td>pH Conductivity N (per ac. basis)</td>
<td></td>
<td>Dec. Nil</td>
<td></td>
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<tr>
<td></td>
<td>7-8 0.2 to 0.7 110-125</td>
<td></td>
<td>Jan. 1.34</td>
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<td></td>
<td>$\text{K}_2\text{O}$ (per CaCO$_3$ Stone % Org. Carbon %)</td>
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<td>ac. basis %</td>
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<td>March 0.45</td>
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<td>300-400 1-5</td>
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<td>April —</td>
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<td>(ii) Mech. analysis :- N.A.</td>
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<td>May 0.50</td>
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<td>Year of est. :-1915-16. It represents Betul-Nimar tract.</td>
<td>(2) Depth :- Deep heavy soils.</td>
<td>July 9.73</td>
<td>since 1957. There is proper drainage system except at some places.</td>
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<td>(4) Structure :- Comb structure when dry.</td>
<td>(5) Soil analysis.</td>
<td>Sept. 12.09</td>
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<td>Soil analysis.</td>
<td>(i) Chemical analysis :- N-0.042 % to 0.0588 %; $\text{P}_2\text{O}_5$-0.303 % to 0.0644 %</td>
<td>Oct. 1.63</td>
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<td>(ii) Mechanical analysis :- N.A.</td>
<td>Nov. 1.65</td>
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<td>Dec. to April Nil</td>
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<td>May 0.20</td>
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<td>Total 39.87</td>
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<td>(figures for 1958—1959)</td>
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### Statement Showing Details of Experimental Stations

**Madhya Pradesh (Contd.)**

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<tr>
<th>Sl. No</th>
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<tr>
<td>3</td>
<td>Bhilsa: Govt. Exptl. Farm</td>
<td><strong>Soil type:</strong> Black cotton soil. <strong>Depth:</strong> 4'-15'. <strong>Colour:</strong> Dark greyish black. <strong>Structure:</strong> Compact and heavy clay to clay loam, moist, tendency for heavy cracks in summer. <strong>Major crops:</strong> Wheat, Jowar, Gram and Paddy.</td>
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<td></td>
<td>Dist: Bhilsa 2 miles from Bhilsa Rly. Stn.</td>
<td>Year of est: 1943. It represents Malwa plateau with deep clayey to higher black cotton soils. <strong>Mechanical analysis:</strong> - N.A. <strong>Chemical analysis:</strong> - N.A.</td>
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<td>June 4.27 July 17.13 Aug. 11.32 Sept. 6.18 Oct. 1.39 Nov. 0.12 Dec. 0.09 Jan. 0.49 Feb. - March 1.51 April 0.18 May - Total 42.58 (Av. of 3 years 1956-1958) <strong>N.A.</strong>  <strong>Wheat</strong>  <strong>Paddy</strong>  <strong>Total</strong>  <strong>3</strong> This piece of land has a general slope running from south to north with a total length of 2850 ft. River Betwa is running hardly at a miles distance to the Southern end of the boundary of the farm.</td>
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<td>4</td>
<td>Bhopal: Central Agri. Res. Farm, Nabi Bagh.</td>
<td><strong>Soil type:</strong> Black Cotton. Other details N.A. <strong>Paddy</strong>  <strong>Wheat</strong>  <strong>N.A.</strong>  <strong>N.A.</strong>  <strong>1</strong>  <strong>2</strong>  <strong>Total</strong>  <strong>3</strong></td>
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<td>Dist: Schore.</td>
<td><strong>Soil type:</strong> Sandy loam (Matal).  <strong>Total</strong>  <strong>3</strong></td>
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<td>5</td>
<td>Bilaspur: Seed and Demonstration Farm.</td>
<td><strong>Soil type:</strong> Sandy loam (Matal). No other details available.  <strong>Total</strong>  <strong>3</strong></td>
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<td>Dist: Bilaspur, 4 miles from Bilaspur Rly. Stn.</td>
<td><strong>Total</strong>  <strong>13</strong></td>
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### STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

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<td>6. Chhindwara :—Govt. Exptl. Farm.</td>
<td>1. Soil types :—(i) Setira (ii) Morund and (iii) Kali.</td>
<td>June</td>
<td>3.37</td>
<td>There are 3 electric pumps, 2 oil engines and one Rahat.</td>
<td>Paddy</td>
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<td>Dist :—Chhindwara, 3 miles from Chhindwara Rly. Station.</td>
<td>No other details available.</td>
<td>July</td>
<td>13.29</td>
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<td>Wheat</td>
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<td>Year of est. : 1919. It represents Saptura division.</td>
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<td>Aug.</td>
<td>15.70</td>
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<td>Potato</td>
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<td>Sept.</td>
<td>7.22</td>
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<td>3.10</td>
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<td>Nov.</td>
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<td>Jan.</td>
<td>0.27</td>
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<td>Feb. to March</td>
<td>Nil</td>
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<td>April</td>
<td>0.84</td>
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<td>May</td>
<td>1.46</td>
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<td>Total</td>
<td>47.27</td>
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<td>7. Damoh :—Govt. Seed and Demonstration Farm.</td>
<td>1. Soil type :—Loam (Patarua and domattai).</td>
<td>Normal annual rainfall</td>
<td>61(^o)</td>
<td></td>
<td>N.A.</td>
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<tr>
<td>Dist :—Damoh, 1 mile from Damoh Rly. Stn.</td>
<td>No other details available.</td>
<td>Wheat</td>
<td>2</td>
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<td>Jowar</td>
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<td>Year of est. :—1916.</td>
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<td>Major crops :—Paddy, Peas, Wheat and Gram.</td>
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<td>8. Dindon :—Govt. Seed and Demons. Form.</td>
<td>N.A.</td>
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<td>Dist :—Mandla</td>
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## STATEMENTS SHOWING DETAILS OF EXPERIMENTAL STATIONS

### MADHYA PRADESH (Contd.)

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<td><strong>9.</strong></td>
<td>Durg:—Govt. Seed and Demonstration Farm.</td>
<td>(i) Soil type:—Sandy loam and loamy (Bhata, Matal and Kanker).</td>
<td>Normal annual</td>
<td>N.A.</td>
<td>Paddy 11</td>
<td>N.A.</td>
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<tr>
<td></td>
<td>Dist:—Durg, 1 mile from Durg Rly. Station.</td>
<td>No other details available.</td>
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<tr>
<td>Year of est. :—1917.</td>
<td>Major crops:—Paddy, Sugarcane, Wheat and Pulses.</td>
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<td><strong>10.</strong></td>
<td>Gwalior:—Central Res. Farm.</td>
<td>(1) Soil type:—Alluvial.</td>
<td>June 4.81</td>
<td>Well irrigation, since inception of the farm. Drainage system poor.</td>
<td>Wheat 15</td>
<td>N.A.</td>
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<td>Dist:—Gwalior, 1 mile from Gwalior Central Rly. Stn.</td>
<td>(2) Depth:—Fairly deep.</td>
<td>July 10.74</td>
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<td>(4) Structure:—Single grain to granulla.</td>
<td>Sept. 7.84</td>
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<td>Major crops:—Wheat, Linseed, Potato, Jowar, Sesamum and Pulses.</td>
<td>Oct. 1.93</td>
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<td>Soil analysis:—(i) Chemical analysis:</td>
<td>Nov. 0.11</td>
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<td></td>
<td>Carbonate</td>
<td>pH</td>
<td>Total soluble salts</td>
<td>Total N</td>
<td>Dec. 0.21</td>
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<td></td>
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<td>in surface layer</td>
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<td>Jan. 1.06</td>
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<td>1-5%</td>
<td>6.5 to 7.5 below 0.1%</td>
<td>0.04 to 0.1%</td>
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<td>Feb. 0.25</td>
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<td>Av. N %</td>
<td>Org. carbon %</td>
<td>Av. P₂O₅ (lb./ac.)</td>
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<td>March 0.51</td>
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<td>0.004-0.015</td>
<td>0.20-0.45</td>
<td>20-120</td>
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<td>April 0.03</td>
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<td>Total 40.76</td>
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<td>May 0.26</td>
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<td>Av. of ten years from 1918 57.</td>
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<td>Mechanical analysis:—</td>
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<td>Clay in surface horizon %</td>
<td>Sand %</td>
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<td>11-22</td>
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11. **Indore**:

   (i) Central Experimental Farm,
   (ii) Institute of Plant Industry.

   Dist:—Indore. 5 miles from Indore Rly. Stn. (W. Rly.)
   Year of est.:—1941. It represents Malwa tract

   (1) Soil type:—Black cotton.
   (2) Depth:—5'-6'.
   (3) Colour:—Black.
   (4) Structure:—Hard.
   (5) Soil analysis:—Not available.
   No details available for Institute of Plant Industry.

   **Soil Details**
   - June: 8.19
   - July: 7.99
   - Aug.: 14.56
   - Sept.: 7.58
   - Oct.: 0.83
   - Nov.: 0.15
   - Dec.: —
   - Jan.: 0.63
   - Feb.: —
   - March —
   - April: 0.01
   - May: 0.09
   **Total:** 40.03

   **Crop Details**
   - June: One well constructed Paddy 2
   - July: in 1955-56. *Jowar* 17
   - Aug.: No proper drainage Potato 10
   - Sept.: system. Cotton 59
   - Oct.: Sugarcane 3
   - Nov.: Oilseeds 15
   - Dec.: Mixed Cropping 2
   - Jan.: Rotational 3
   - Feb.: —
   - March —
   - April: —
   - May: —
   **Total:** 144

   N.A. = Not Available
STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS
MADHYA PRADESH (Contd.)

Dist. :— Jabalpore. 4 miles from Jabalpore Rly. Sta. 
Year of est. :— 1912. It represents light soil areas of Jabalpore. 
(1) Soil type :— Schera 
(2) Depth :— 1½' 
(3) Colour :— Greyish 
(4) Structure :— N.A. 
(5) Soil analysis :— (i) Chemical analysis :— Not available. 
(ii) Mechanical analysis :—

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<th></th>
<th>Coarse sand</th>
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<th>Fine silt</th>
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<tr>
<td>Schera</td>
<td>22.59</td>
<td>37.57</td>
<td>17.77</td>
<td>7.93</td>
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<td>Domatta</td>
<td>17.16</td>
<td>15.75</td>
<td>27.28</td>
<td>13.45</td>
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<tr>
<td>Kahar II</td>
<td>0.46</td>
<td>5.45</td>
<td>11.76</td>
<td>16.87</td>
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Clay :— Moisture Loss on ignition CaCO3

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<tr>
<td>Schera</td>
<td>11.10</td>
<td>1.71</td>
<td>1.42</td>
<td>0.31</td>
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<td>Domatta</td>
<td>19.67</td>
<td>3.25</td>
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<td>0.11</td>
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<tr>
<td>Kahar II</td>
<td>51.20</td>
<td>6.37</td>
<td>6.92</td>
<td>0.92</td>
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June 5.57 Canal irrigation from Jabalpur 
July 17.77 Wheat 30 
Aug. 15.42 Paddy 24 
Sept. 8.36 Wheat 30 
Oct. 4.34 Paddy 24 
Nov. 1.19 Mixed 
Dec. 0.91 Cropping 1 
Jan. 0.81 The Schera fields are heavily waterlogged in rainy seasons. 
Feb. 0.37 
March 1.06 
April 0.08 
May 0.18 

Dist. :— Nimar (east.) 3 miles from Khandwa Rly. Sta. 
Year of est. :— 1960. 
(1) Soil type :—Black cotton (Morend No. 2) 

Khandwa Rly. Sta. 
Year of est. :— 1960. 
(1) Soil type :—Black cotton (Morend No. 2) 

Khandwa Rly. Sta. 
Year of est. :— 1960. 

Jowar 4 N.A. 
Cotton 5 N.A. 

Total 9 

Normal annual rainfall 30°
### STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

#### MADHYA PRADESH (Contd.)

<table>
<thead>
<tr>
<th>No.</th>
<th>1</th>
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<th>5</th>
<th>6</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Dist :-Hoshangabad, 4 miles from</td>
<td></td>
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<tr>
<td></td>
<td>Hoshangabad Rly. Station, 2 miles</td>
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<td></td>
<td>from Powerkheda Rly. Stn.</td>
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<td></td>
<td>Year of est. :-1903. It represents</td>
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<tr>
<td></td>
<td>Narmada valley tract.</td>
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<tr>
<td></td>
<td>Major crops :-Wheat, Gram, Linseed,</td>
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<tr>
<td></td>
<td><em>Tul, Til, Jowar</em> etc.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(1) Soil type :- (i) Maryar (ii)</td>
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<td></td>
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<tr>
<td></td>
<td>Morand I and (ii) Morand II.</td>
<td></td>
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<tr>
<td></td>
<td>(2) Depth :-from a few feet to 20 feet.</td>
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<tr>
<td></td>
<td>(3) Colour :-Black.</td>
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<td></td>
<td>(4) Structure :-N.A.</td>
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<td>(5) Soil analysis :-Refer next page.</td>
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<tr>
<td></td>
<td>June 5.0</td>
<td>Wells and</td>
<td>Wheat 37</td>
<td>Fairly levelled</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>July 17.0</td>
<td><em>nallahs</em>, tube-</td>
<td>Jowar 2</td>
<td>and well drained.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aug. 16.0</td>
<td>wells already</td>
<td>Pulses 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sept. 9.0</td>
<td>sunk. Facilities</td>
<td>Oilseeds 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Oct. 0.5</td>
<td>were made available from 1950</td>
<td>Mixed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nov. to</td>
<td></td>
<td>Cropping 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>May 2.0</td>
<td>for irrigating</td>
<td>Rotational 1</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Total 49.5</td>
<td>wheat. No drainage system.</td>
<td></td>
<td></td>
<td>Total 49</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Av. of 50 years; 1903 to 1953).</td>
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<td></td>
</tr>
</tbody>
</table>

| 15. | Raipur :-Govt. Exptl. Farm, Labhandi. | | | | | | |
|     | Dist :-Raipur. 6 miles from Raipur | | | | | | |
|     | Rly. Station. | | | | | | |
|     | Year of est. :-1903. | | | | | | |
|     | Major crops :-Paddy, Gram, Wheat. | | | | | | |
|     | (1) Soil type :-Sandy loam, loam and clayey loam. | | | | | | |
|     | No other details available. | | | | | | |
|     | Normal annual rainfall 52". | | | | | | |
|     | | N.A. | Paddy 33 | N.A. | | | | |
|     | | | Wheat 14 | | | | | |
|     | | | | | | | Total 47 | | |
### I. Analysis of Hydrochloric acid extract:

<table>
<thead>
<tr>
<th>Depth in inches</th>
<th>Fe$_2$O$_3$ %</th>
<th>SiO$_2$ %</th>
<th>MnO$_2$ %</th>
<th>CaO %</th>
<th>MgO %</th>
<th>K$_2$O %</th>
<th>P$_2$O$_5$ %</th>
<th>Loss of ignition %</th>
<th>CO$_2$ %</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0&quot;—8&quot;</td>
<td>6.64</td>
<td>0.05</td>
<td>0.11</td>
<td>2.89</td>
<td>1.92</td>
<td>0.37</td>
<td>0.05</td>
<td>2.13</td>
<td>0.74</td>
<td>101.34</td>
</tr>
<tr>
<td>8&quot;—26&quot;</td>
<td>6.54</td>
<td>0.04</td>
<td>0.11</td>
<td>3.27</td>
<td>2.19</td>
<td>6.66</td>
<td>0.05</td>
<td>2.16</td>
<td>1.63</td>
<td>101.00</td>
</tr>
</tbody>
</table>

### II. Exchange capacity and exchangeable basis in M.E. per 100 gms. over dry soil:

<table>
<thead>
<tr>
<th>Depth in inches</th>
<th>Ca</th>
<th>Mg</th>
<th>K</th>
<th>Na</th>
<th>Total</th>
<th>Exchange capacity</th>
<th>Ca/Mg</th>
<th>Total soluble salt %</th>
<th>pH</th>
<th>Clay %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0&quot;—8&quot;</td>
<td>35.21</td>
<td>6.44</td>
<td>2.22</td>
<td>n. d.</td>
<td>43.87</td>
<td>41.99</td>
<td>5.46</td>
<td>0.028</td>
<td>7.83</td>
<td>44.60</td>
</tr>
<tr>
<td>8&quot;—26&quot;</td>
<td>32.57</td>
<td>6.09</td>
<td>2.98</td>
<td>n. d.</td>
<td>41.64</td>
<td>38.97</td>
<td>5.34</td>
<td>0.0796</td>
<td>7.80</td>
<td>45.60</td>
</tr>
</tbody>
</table>

### III. Organic Carbon and Nitrogen:

<table>
<thead>
<tr>
<th>Depth in inches</th>
<th>Carbon %</th>
<th>Nitrogen %</th>
<th>C/N Ratio</th>
<th>Organic matter %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0&quot;—8&quot;</td>
<td>0.625</td>
<td>0.053</td>
<td>11.77</td>
<td>1.175</td>
</tr>
<tr>
<td>8&quot;—26&quot;</td>
<td>0.427</td>
<td>0.044</td>
<td>9.58</td>
<td>0.734</td>
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</tbody>
</table>

#### (ii) Mechanical analysis:*

<table>
<thead>
<tr>
<th>Depth in inches</th>
<th>Coarse sand %</th>
<th>Fine sand %</th>
<th>Silt %</th>
<th>Clay %</th>
<th>Carbonates %</th>
<th>Total</th>
<th>Moisture %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0&quot;—8&quot;</td>
<td>8.80</td>
<td>20.50</td>
<td>23.20</td>
<td>44.60</td>
<td>1.64</td>
<td>98.77</td>
<td>5.53</td>
</tr>
<tr>
<td>8&quot;—26&quot;</td>
<td>9.50</td>
<td>19.50</td>
<td>21.10</td>
<td>45.60</td>
<td>3.72</td>
<td>100.12</td>
<td>6.19</td>
</tr>
</tbody>
</table>

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*Note: *n. d. indicates not determined.
<table>
<thead>
<tr>
<th></th>
<th>1</th>
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<tbody>
<tr>
<td>16.</td>
<td>Reora</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>State Mech. Farm. (Satna)</td>
<td></td>
<td>Soil type: Light black soil deficient in humus and nitrogen.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Dist: Satna, 7 miles from Satna Rly. Station.</td>
<td></td>
<td>No other details available.</td>
<td></td>
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<tr>
<td></td>
<td>Year of est.: 1952.</td>
<td></td>
<td>It represents paddy-wheat tract having mixed red and black soil.</td>
<td></td>
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<tr>
<td>17.</td>
<td>Saugar</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Govt. Seed and Dem. Farm.</td>
<td></td>
<td>Soil type: Black soils with kankars.</td>
<td></td>
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<tr>
<td></td>
<td>Dist: Saugar, 3 miles from Saugar Rly. Stn.</td>
<td></td>
<td>Depth: 1' to 4'.</td>
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</tbody>
</table>

June 2.01 Facilities available since 1953. Wheat 2 There is a general steep slope towards western side and also a slight slope towards southern portion. However, the fields under Bandh system are more or less plane and those unbunded are sloppy.

July 15.19 There is proper drainage system.  
Aug. 4.90  
Sept. 9.05  
Oct. 3.00  
Nov. to  
Dec. Nil  
Jan. 1.06  
Feb. 0.03  
March to  
April Nil  
May 0.35  

Total 35.59 Figures for period 1958-1959

June 1.58 There are 3 oil engines since 1956. No drainage system. Wheat 6 The whole farm area is lying with a slope of 1' in 200' in extension of one mile long strip. The land is susceptible to erosion.

July 20.40 Jowar 3  
Aug. 14.57  
Sept. 6.48  
Oct. 6.57  
Nov. to  
Dec. Nil  
Jan. 1.61  
Feb. to  
May Nil  

Total 14  

Total 51.01
### STATEMENT SHOWING DETAILS OF EXPERIMENTAL STATIONS

**MADHYA PRADESH (Contd.)**

<p>| | | | | | | |</p>
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<tbody>
<tr>
<td>18.</td>
<td>Seoni:—Govt. Seed and Demonstration Farm.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>Wheat 10</td>
<td>Mixed Cropping 1</td>
</tr>
<tr>
<td></td>
<td>Dist:—Seoni.</td>
<td></td>
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<tr>
<td>19.</td>
<td>Ujjain :—Experimental Farm.</td>
<td>June 3.09</td>
<td>Nil. (Facilities likely from</td>
<td>Paddy 1</td>
<td>Almost level.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dist:—Ujjain. 3 miles from Ujjain Rly. Stn.</td>
<td>July 11.46</td>
<td>Wheat 5</td>
<td></td>
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<tr>
<td></td>
<td>Year of est.:—1916. It represents Malva plateau.</td>
<td>Aug. 12.30</td>
<td>Jowar 1</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Major crops:—Jowar, Cotton. Wheat and Gram.</td>
<td>Sept. 5.60</td>
<td>Cotton 2</td>
<td></td>
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<tr>
<td></td>
<td>(1) Soil type:—Black cotton soil.</td>
<td>Oct. 2.47</td>
<td>Mixed Cropping 1</td>
<td></td>
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<td></td>
<td>(2) Depth:—1' to 10'.</td>
<td>Nov. 0.26</td>
<td></td>
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<tr>
<td></td>
<td>(3) Colour:—Black.</td>
<td>Dec. 0.10</td>
<td></td>
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<td></td>
<td>(4) Structure:—Clayev.</td>
<td>Jan. 0.64</td>
<td></td>
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<tr>
<td></td>
<td>(5) Soil analysis:—Not available.</td>
<td>Feb. Nil</td>
<td></td>
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<td></td>
<td></td>
<td>March 0.24</td>
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<td></td>
<td></td>
<td>April 0.10</td>
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<td></td>
<td></td>
<td>May 0.30</td>
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<td></td>
<td></td>
<td>Total 36.11</td>
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<tr>
<td></td>
<td>Av. of 3 years</td>
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<tr>
<td>20.</td>
<td>Waraseoni:—Govt. Seed and Demo. Farm.</td>
<td>Normal annual rainfall 34'.</td>
<td>N.A.</td>
<td>Paddy 7</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Dist:—Balaghat. 2 miles from Waraseoni.</td>
<td></td>
<td></td>
<td>Wheat 2</td>
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<tr>
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<td>Year of est.:—1917.</td>
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</tr>
<tr>
<td></td>
<td>Major crops:—Wheat, Gram, Sugarcane, Linseed, Paddy and Vegetables.</td>
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<tr>
<td></td>
<td>(1) Soil type:— Sandy loam and loamy silty Mirdand I and Mirdand II</td>
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<tr>
<td></td>
<td>No other details available.</td>
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</tbody>
</table>
Crop: Paddy (Kharif).
Site: Harai Experimental Farm, Bagwai.

Object: To find out suitable method and time of application of A/S to Paddy.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Masoor. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 6 to 8.8.1953. (iv) (a) Two ploughings by desi plough. (b) to (e) N.A. (v) 10 C.L./ac. of F.Y.M. (vi) Bankura No. 1. (medium). (vii) Irrigated. (viii) Nil. (ix) 19.89’. (x) 7.12.1953.

2. TREATMENTS:
   1. No manure.
   2. 20 lb./ac. of N as A/S applied in plough furrows before letting in water for puddling.
   3. 40 lb./ac. of N as A/S applied in plough furrows before letting in water for puddling.
   4. 20 lb./ac. of N as A/S applied 30 days after transplanting.
   5. 40 lb./ac. of N as A/S applied 30 days after transplanting.
   6. 20 lb./ac. of N as A/S applied 60 days after transplanting.
   7. 40 lb./ac. of N as A/S applied 60 days after transplanting.
   8. 20 lb./ac. of N as A/S applied half 30 days after and the balance 60 days after transplanting.
   9. 40 lb./ac. of N as A/S applied half 30 days after and the balance 60 days after transplanting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 18’ x 76’. (b) 12’ x 70’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Poor. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953 to 1954. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 444.7 lb./ac.
   (ii) 189.7 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>404.9</td>
<td>6.</td>
<td>494.2</td>
</tr>
<tr>
<td>2.</td>
<td>350.0</td>
<td>7.</td>
<td>397.0</td>
</tr>
<tr>
<td>3.</td>
<td>300.7</td>
<td>8.</td>
<td>572.0</td>
</tr>
<tr>
<td>4.</td>
<td>434.3</td>
<td>9.</td>
<td>469.9</td>
</tr>
<tr>
<td>5.</td>
<td>382.4</td>
<td>S.E./mean =94.8 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).
Site: Harai Experimental Farm, Bagwai.

Object: To find out the effect of manuring Paddy with A/S and Super in varying doses.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 22.7.1952. (iv) (a) Ploughing by chattanooga plough and puddling. (b) and (c) N.A. (d) 9’. (e) N.A. (v) Nil. (vi) Bankura No. 1. (medium). (vii) Irrigated. (viii) One weeding. (ix) 27.98’. (x) 26, 27.11.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of \( P_{2O_3} \): \( P_0 = 0 \), \( P_1 = 40 \) and \( P_2 = 80 \) lb./ac.
   (2) 4 levels of N: \( N_0 = 0 \), \( N_1 = 20 \), \( N_2 = 40 \) and \( N_3 = 60 \) lb./ac.

3. DESIGN:
   (i) 3 x 4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 66’ x 15’. (b) 60’ x 9’. (v) 3’ around. (vi) Yes.

4. GENERAL:
   (i) No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1952—1954. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 2917 lb./ac.
(ii) 344.0 lb./ac.
(iii) N and P effects are highly significant while interaction NP is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
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<tbody>
<tr>
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<td>250</td>
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<td>3550</td>
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<tr>
<td>P₂</td>
<td>2675</td>
<td>2970</td>
<td>3455</td>
<td>3575</td>
<td>3169</td>
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<tr>
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<td>2361</td>
<td>2724</td>
<td>3093</td>
<td>3491</td>
<td>2917</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 99.2 lb./ac.
S.E. of marginal mean of P = 76.0 lb./ac.
S.E. of body of table = 172.0 lb./ac.

Crop :- Paddy (Kharij).
Site :- Harsi Experimental Farm, Bagwai.
Object :- To find out the best combination of N and P for Paddy crop.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Gram and Peas. (c) Nil. (ii) (a): Clay loam. (b) N.A. (iii) 30.7.1953 to 5.8.1953. (iv) (a) Puddling. (b) Transplanted. (c) N.A. (d) Row to row—9'. (e) 4. (iv) 10 to 15 C.L./ac. of F Y M. (vi) T.21 (medium). (vii) Irrigated. (viii) Weeding one. (ix) 19'. (x) 1 to 3.2.1953.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 4 levels of N as A/S: N₀=0, N₁=20, N₂=30 and N₃=40 lb./ac. of N.
(2) 4 levels of P₂O₅ as Super: P₀=0, P₁=20, P₂=30 and P₃=40 lb./ac. of P₂O₅.
A/S applied three weeks after transplantation. Super was put in the plots before mulching.

3. DESIGN:

(i) 4x4 Balanced Lattice. (ii) (a) 4 blocks/replication and 4 plots/block. (b) 264' x 72'. (iii) 5. (iv) (a) 18' x 66'. (b) 12' x 60'. (v) 3' on each side and 3' on each end. (vi) N.A.

4. GENERAL:

(i) No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1954. (b) No. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS:

(i) 2067 lb./ac.
(ii) 457 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac. (Adjusted)

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
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<th>P₂</th>
<th>P₃</th>
<th>Mean</th>
</tr>
</thead>
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<td>2335</td>
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<td>N₃</td>
<td>2098</td>
<td>2258</td>
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<td>1923</td>
<td>2047</td>
<td>2073</td>
<td>2226</td>
<td>2067</td>
</tr>
</tbody>
</table>
Crapp :- Paddy.

Site :- Harsi Experimental Farm, Bagwai.

Ref :- M.P. 50(72).

Type :- 'M'.

Object :- To find out a suitable dose of manure for Paddy crop under irrigation.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam. (b) N.A. (iii) 3 and 4.8.1960. (iv) (a) Pudding. (b) Transplanted. (c) —. (d) 9’ x 6’. (e) 3 seedlings. (v) Nil. (vi) Basmati. (vii) Irrigated. (viii) One weeding. (x) 22.48”. (x) 5 to 9.12.1950.

2. TREATMENTS:
   All combinations of (1) and (2)+a control.
   (1) 3 sources of N: S\textsubscript{1}=G.N.C., S\textsubscript{2}=A/S and S\textsubscript{3}=G.N.C. and A/S in the ratio of 1 : 1.
   (2) 3 levels of N: N\textsubscript{1}=20, N\textsubscript{2}=40 and N\textsubscript{3}=60 lb./ac.

Manurial doses were given at the time of transplanting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) 150’ x 66’. (iii) 6. (iv) (a) 15’ x 66”. (b) 9’ x 60’. (v) Four rows on either side. (vi) Yes.

4. GENERAL:
   (i) No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950—1951. (b) No. (c) Nil. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 621 lb./ac.
   (ii) 113.9 lb./ac.
   (iii) None the effects is significant.
   (iv) Av. yield of grain in lb./ac.

   \begin{center}
   \begin{tabular}{|c|c|c|c|c|}
   \hline
   & N\textsubscript{1} & N\textsubscript{2} & N\textsubscript{3} & Mean \\
   \hline
   S\textsubscript{1} & 560 & 697 & 691 & 649 \\
   S\textsubscript{2} & 572 & 652 & 633 & 619 \\
   S\textsubscript{3} & 565 & 605 & 602 & 591 \\
   \hline
   Mean & 566 & 651 & 642 & 620 \\
   \hline
   \end{tabular}
   \end{center}

   S.E. of any marginal mean = 26.86 lb./ac.
   S.E. of body of table = 46.52 lb./ac.

---

Crop :- Paddy (Kharif).

Site :- Harsi Experimental Farm, Bagwai.

Ref :- M.P. 51(43).

Type :- 'M'.

Object :- To find out a suitable dose of manure for Paddy crop under irrigated conditions.

1. BASAL CONDITIONS.
   (i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Clay loam. (b) N.A. (iii) 30.7.1951 to 3.8.1951. (iv) (a) One ploughing by chattanoga plough, 1 by sabul plough and 2 bakharings and bunding. (c) to (e) N.A. (v) 12 C.L. of Compost spread. (vi) Basmati. (vii) Irrigated. (viii) Weeding, pudding, transplanting and intercultivation. (x) N.A. (x) 14.11.51 and 15.11.1951.

2. TREATMENTS:
   All combinations of (1) and (2)+a control.
   (1) 3 sources of N: S\textsubscript{1}=G.N.C., S\textsubscript{2}=A/S and S\textsubscript{3}=A/S and G.N.C. in 1 : 1 ratio.
   (2) 3 levels of N: N\textsubscript{1}=20, N\textsubscript{2}=40 and N\textsubscript{3}=60 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 15’ x 66’. (b) 9’ x 60’. (v) 3’ around. (vi) Yes.
4. GENERAL:
(i) Ordinary. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1950-N.A. (b) N.A. (c) N.A. (v) (a) to (b) N.A. (vi) Rainfall was scanty. (vii) Nil.

5. RESULTS:
(i) 1354 lbs./ac.
(ii) 191.2 lb./ac.
(iii) All effects except interaction N x S are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>1751</td>
<td>1526</td>
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<tr>
<td>S2</td>
<td>1102</td>
<td>1236</td>
<td>1490</td>
<td>1276</td>
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<td>S3</td>
<td>1284</td>
<td>1260</td>
<td>1536</td>
<td>1360</td>
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<tr>
<td>Mean</td>
<td>1222</td>
<td>1347</td>
<td>1592</td>
<td>1387</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 45.1 lb./ac.
S.E. of body of table = 78.0 lb./ac.

Crop :- Paddy.

Site :- Govt. Agri. Res. Farm, Bhilsa.

Object : To find out suitable combination of fertilisers for Paddy crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Heavy clay. (b) N.A. (iii) 9.7.1953. (iv) Harrowing and bakharising. (b) Seeds drilled. (c) 20 lb./ac. (d) 2' between rows. (e) N.A. (f) Nil. (vi) Local. (vii) Unirrigated. (viii) Two hand weedings in August and September. (ix) 40'. (x) N.A.

2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N as A/S.
3. 40 lb./ac. N as A/S.
4. 20 lb./ac. of N as A/S+30 lb./ac. of P2O5 as Super.
5. 40 lb. of N as A/S+30 lb./ac. P2O5 as Super.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 58' x 12'. (b) 54' x 10'. (v) One row on both the sides and 2' of each row at both ends. (vi) Yes.

4. GENERAL:
(i) No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 to 1955. (v) Yes. (c) N.A. (v) N.A. and (b) N.A. (vi) Nil. (vii) One block was completely damaged by Helminthosporium. In block I treatment 1 and 3 should be treated as missing because of similar damages.

5. RESULTS:
(i) 1213 lb./ac.
(ii) 15.97 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>2.</td>
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<td>3.</td>
<td>1417</td>
</tr>
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<td>4.</td>
<td>1328</td>
</tr>
<tr>
<td>5.</td>
<td>1451</td>
</tr>
</tbody>
</table>

S.E. of difference of two means neither of which involves a missing value = 10.08 lb./ac.
S.E. of one which involves a missing value = 10.38 lb./ac.
S.E. of 1 vs 5 treatment means = 11.28 lb./ac.
Crop :- Paddy. 
Ref :- M.P. 48(37).

Site :- Central Agri. Res. Farm, Nabibagh, Bhopal. 
Type :- ‘M’.

Object :- To find out how far the black cotton soil of Bhopal is deficient in P and N for Paddy.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Paddy. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (ii) 24.7.1948. (iv) (a) 6 ploughings, one bakhar and puddling. (b) Transplanted. (c) —, (d) 9’ x 9’. (e) N.A. (v) N.A. (vi) IP 24 (late). (vii) Unirrigated. (viii) One weeding. (ix) N.A. (x) 31.11.1948 and 11.12.1948.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of N as A/S: N₀ = 0 and N₁ = 54 lb./ac.
   (2) 2 levels of Ammo. Phos.: P₀ = 0 and P₁ = 17.1 lb./ac.
   Manures applied on 24.7.1948.

3. DESIGN:
   (i) 2 x 2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Manured plots were dark in colour while unmanured were pale. In control some plants died. General growth is unsatisfactory as the plants were weak and small in height. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 536.5 lb./ac.
   (ii) 161.1 lb./ac.
   (iii) Only interaction NP is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>364.9</td>
<td>611.7</td>
<td>488.3</td>
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<tr>
<td>P₁</td>
<td>683.3</td>
<td>485.9</td>
<td>584.6</td>
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<tr>
<td>Mean</td>
<td>524.1</td>
<td>548.8</td>
<td>536.5</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 56.94 lb./ac.
S.E. of body of table = 80.55 lb./ac.

---

Crop :- Paddy. 
Ref :- M.P. 48(40).

Site :- Govt. Seed and Demonstration Farm, Bilaspur. 
Type :- ‘M’.

Object :- To study the effect of T.C. on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) Kachhar (sandy). (b) N.A. (iii) N.A. (iv) (a) Ploughing and cross ploughing. (b) Transplanting. (c) to (e) N.A. (v) N.A. (vi) Ajras (medium). (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as T.C.
   3. 40 lb./ac. of N as T.C.
   4. 20 lb./ac. of N as cowdung.
   5. 40 lb./ac. of N as cowdung.
3. DESIGN:
   (i) R.B.D. (ii) (a) 9, (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948 to 1952. (b) No. (c) N.A. (v)
   (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1513 lb./ac.
   (ii) 235.2 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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<td>3.</td>
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<td>162</td>
</tr>
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<td>4.</td>
<td>1581</td>
<td>9.</td>
<td>1301</td>
</tr>
<tr>
<td>5.</td>
<td>1547</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   S.E./mean = 96.1 lb./ac.

Crop = Paddy.  
Site = Govt. Seed and Demonstration Farm, Bilaspur. Type = 'M'.

Object = To study the effect of T.C. on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil. (i) (a) Kasidar (sandy). (b) N.A. (iii) N.A. (iv) (a) Ploughing
   and cross ploughing. (b) Transplanting. (c) to (c) N.A. (v) Nil. (vi) A/S (medium). (vii) N.A
   (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as T.C.
   3. 40 lb./ac. of N as T.C.
   4. 20 lb./ac. of N as cowdung.
   5. 40 lb./ac. of N as cowdung.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948 to 1952. (b) No. (c) N.A. (v)
   (a) Raipur. (b) N.A. (vi) and (vii) Nil. As there is no record, no reason for low yield against
   treatment No. 9 can be given.

5. RESULTS:
   (i) 1513 lb./ac.
   (ii) 235.2 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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</tr>
<tr>
<td>5.</td>
<td>2781</td>
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<td></td>
</tr>
</tbody>
</table>

   S.E./mean = 216.4 lb./ac.
Crop: Paddy.  
Site: Govt. Seed and Demonstration Farm, Bilaspur.  
Type: 'M'.

Object: To study the effect of T.C. on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil.  
   (ii) (a) Kaishar (sandy). (b) N.A. 
   (iii) N.A.  
   (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c) —, (d) to (e) N.A. (v) Nil. (vi) Ajan (medium). (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. Control.  
   2. 20 lb./ac. of N as T.C.  
   3. 40 lb./ac. of N as T.C.  
   4. 20 lb./ac. of N as cowdung.  
   5. 40 lb./ac. of N as cowdung.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. 
   (iii) 6.  
   (iv) (a) and (b) 1/40 ac.  
   (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948 to 1952. (b) No. (c) N.A. (v) Nil. (vi) Raipur. (vii) N.A. and (viii) Nil.

5. RESULTS:
   (i) 1383 lb./ac.  
   (ii) 204.5 lb./ac.  
   (iii) Treatments do not differ significantly.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
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<td>1401</td>
<td>9</td>
<td>1654</td>
</tr>
<tr>
<td>5</td>
<td>1367</td>
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<td></td>
</tr>
</tbody>
</table>

S.E./mean = 83.6 lb./ac.

Crop: Paddy.  
Site: Govt. Seed and Demonstration Farm, Bilaspur.  
Type: 'M'.

Object: To study the effect of T.C. on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) Nil.  
   (ii) (a) Kaishar (Sandy). (b) N.A.  
   (iii) N.A.  
   (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c) —, (d) and (e) N.A. (v) Nil. (vi) Ajan (medium). (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. Control.  
   2. 20 lb./ac. of N as T.C.  
   3. 40 lb./ac. of N as T.C.  
   4. 20 lb./ac. of N as cowdung.  
   5. 40 lb./ac. of N as cowdung.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. 
   (iii) 6.  
   (iv) (a) and (b) 1/40 ac.  
   (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A.  
5. RESULTS:
(i) 2181 lb./ac.
(ii) 246.7 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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</tr>
<tr>
<td>5.</td>
<td>2094</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 10.4 lb./ac.

Crop : Paddy.
Site : Govt. Seed and Demonstration Farm, Bilaspur.
Object :—To study the residual effect of T.C. on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Kachhar (sandy). (a) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (vi) Nil. (vi) Ajan (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
1. Control. 6. 10 lb./ac. of N as G.N.C.
2. 20 lb./ac. of N as T.C. 7. 20 lb./ac. of N as G.N.C.
3. 40 lb./ac. of N as T.C. 8. 10 lb./ac. of N as A/S.
4. 20 lb./ac. of N as cowdung. 9. 20 lb./ac. of N as A/S.
5. 40 lb./ac. of N as cowdung.

Manures applied to paddy during 1948-49.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949—1952. (b) No. (c) N.A. (v) (a) Rasper. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1707 lb./ac.
(ii) 152.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1627</td>
<td>6.</td>
<td>1581</td>
</tr>
<tr>
<td>2.</td>
<td>1727</td>
<td>7.</td>
<td>1764</td>
</tr>
<tr>
<td>3.</td>
<td>1761</td>
<td>8.</td>
<td>1798</td>
</tr>
<tr>
<td>4.</td>
<td>1681</td>
<td>9.</td>
<td>1788</td>
</tr>
<tr>
<td>5.</td>
<td>1728</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 62.0 lb./ac.

Crop : Paddy.
Site : Govt. Seed and Demonstration Farm, Bilaspur.
Object :—To study the residual effect of T.C. on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Kachhar (sandy). (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) Nil. (vi) Ajan (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.
2. TREATMENTS:
1. Control. 6. 10 lb./ac. of N as G.N.C.
2. 20 lb./ac. of N as T.C. 7. 20 lb./ac. of N as G.N.C.
3. 40 lb./ac. of N as T.C. 8. 10 lb./ac. of N as A/S.
4. 20 lb./ac. of N as cowdung. 9. 20 lb./ac. of N as A/S.
5. 40 lb./ac. of N as cowdung.
Manures applied to paddy during 1949-50.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949—1952. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1707 lb./ac.
(ii) 592.2 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1561</td>
<td>6.</td>
<td>1514</td>
</tr>
<tr>
<td>2.</td>
<td>1921</td>
<td>7.</td>
<td>1974</td>
</tr>
<tr>
<td>3.</td>
<td>2014</td>
<td>8.</td>
<td>1734</td>
</tr>
<tr>
<td>4.</td>
<td>1801</td>
<td>9.</td>
<td>1054</td>
</tr>
<tr>
<td>5.</td>
<td>1794</td>
<td>S.E./mean</td>
<td>207.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Paddy. Ref. :- M.P. 51(63).
Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- ‘M’.

Object :- To study the residual effect of T.C. on Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Kachhar (sandy). (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) -—. (d) and (e) N.A. (v) Nil. (vi) Ajan (medir.m). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
1. Control. 6. 10 lb./ac. of N as G.N.C.
2. 20 lb./ac. of N as T.C. 7. 20 lb./ac. of N as G.N.C.
3. 40 lb./ac. of N as T.C. 8. 10 lb./ac. of N as A/S.
4. 20 lb./ac. of N as cowdung. 9. 20 lb./ac. of N as A/S.
5. 40 lb./ac. of N as cowdung.
Manures applied to paddy during 1950-51.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949—1952. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2640 lb./ac.
(ii) 362.8 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2561</td>
<td>6.</td>
<td>2795</td>
</tr>
<tr>
<td>2.</td>
<td>2615</td>
<td>7.</td>
<td>2781</td>
</tr>
<tr>
<td>3.</td>
<td>2566</td>
<td>8.</td>
<td>2655</td>
</tr>
<tr>
<td>4.</td>
<td>2501</td>
<td>9.</td>
<td>2721</td>
</tr>
<tr>
<td>5.</td>
<td>2508</td>
<td>S.E./mean</td>
<td>148.1 lb./ac.</td>
</tr>
</tbody>
</table>
Crop : Paddy.  
Ref : M.P. 52(45).

Site : Govt. Seed and Demonstration Farm, Bilaspur. Type : - 'M'.

Object :-To study the residual effect of T.C. on Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Kachhar (sandy). (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c)-, (d) and (e) N.A. (v) Nil. (vi) Ajas (medium). (vii) Irrigated. (viii) Weeding (ix) N.A. (x) N.A.

2. TREATMENTS :
   1. Control.  6. 10 lb./ac. of N as G.N.C.
   2. 20 lb./ac. of N as T.C.  7. 20 lb./ac. of N as G.N.C.
   3. 40 lb./ac. of N as T.C.  8. 10 lb./ac. of N as A/S.
   4. 20 lb./ac. of N as cowdung.  9. 20 lb./ac. of N as A/S.
   5. 40 lb./ac. of N as cowdung.

3. DESIGN :
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952 to 1954. (b) No. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1071 lb./ac.
   (ii) 352.9 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>860</td>
<td>6.</td>
<td>934</td>
</tr>
<tr>
<td>2.</td>
<td>1007</td>
<td>7.</td>
<td>1194</td>
</tr>
<tr>
<td>3.</td>
<td>1334</td>
<td>8.</td>
<td>1174</td>
</tr>
<tr>
<td>4.</td>
<td>1094</td>
<td>9.</td>
<td>1221</td>
</tr>
<tr>
<td>5</td>
<td>820</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean =144.1 lb./ac.

Crop :- Paddy.  
Ref : M.P. 52(45).

Site :- Govt. Seed and Demonstration Farm, Bilaspur. Type :- 'M'.

Object :-To compare the effect of A/S and A.S.N. on Paddy

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Kachhar. (b) N.A. (iii) 8.9.1952. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c)-, (d) and (e) N.A. (v) Nil. (vi) No. 30. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 9.12.1952.

2. TREATMENTS :
   1. 40 lb./ac. of N as A/S.
   2. 40 lb./ac. of N as A.S.N.

3. DESIGN :
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 66' x 161'. (v) Nil. (vi) Yes.

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

5. RESULTS :
   (i) 2/0 lb./ac.
   (ii) 17.75 lb./ac.
   (iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>252</td>
</tr>
<tr>
<td>2.</td>
<td>268</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 8.87 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Paddy (Kharif).

Site: Govt. Exptl. Farm, Chindwara.

Object: To find out suitable N manure for Paddy.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) N.A. (iii) 20.6.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated.

2. TREATMENTS:
   1. 20 lb./ac. of N as G.N.C.
   2. 20 lb./ac. of N as cotton seed cake (decorticated).
   3. 20 lb./ac. of N as cotton seed cake (undecorticated).
   4. 20 lb./ac. of N as A/S.

   Manures applied on 19.6.1951.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) 138’x33’. (iii) 5. (iv) (a) and (b) 33’x33’. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—N.A. (b) and (c) N.A. (v) Scanty rains affected the yield. The yield is too poor. (vi) Nil.

5. RESULTS:
   (i) 190.5 lb./ac.
   (ii) 38.2 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>182.0</td>
</tr>
<tr>
<td>2.</td>
<td>210.0</td>
</tr>
<tr>
<td>3.</td>
<td>186.0</td>
</tr>
<tr>
<td>4.</td>
<td>184.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 17.1 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Paddy.

Site: Govt. Seed and Demonstration Farm, Dindori. Type: ‘M’.

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) to (ix) N.A. (x) 2.10.1951.

2. TREATMENTS:
   1. 20 lb./ac. of N as G.N.C.
   2. 20 lb./ac. of N as decorticated cotton cake.
   3. 20 lb./ac. of N as undecorticated cotton cake.
   4. 20 lb./ac. of N as A/S.
   5. Control.
3. DESIGN:
   (i) R.B.D.  (ii) (a) 5. (b) N.A.  (iii) 5.  (iv) (a) N.A.  (b) 2.  
   (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) to (c) N.A.  (v) N.A.  
   (vi) N.A.  (vii) N.A.

5. RESULTS:
   (i) 839 lb./ac.  
   (ii) 241.6 lb./ac.  
   (iii) Treatments do not differ significantly.  
   (iv) Av. yield of grain in lb./ac.:
      Treatment     Av. yield
      1.          1096
      2.           800
      3.           756
      4.           862
      5.           680
      S.E./mean = 108.0 lb./ac.

Crop: Paddy (Kharif) .  
Site: Govt. Seed and Demonstration Farm, Durg.  
Type: 'M'.

Object: To study the effect of varying doses of green leaves as compared to cattle dung, G.N.C, and A/S.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Kukhar.  (b) N.A. (iii) 13.6.1948/29, 30.7.1948.  
   (iv) (X) Ploughing and cross ploughing.  (b) Transplanting.  (c) --.  
   (d) N.A. (e) N.A. (f) N.A. (g) Last bal later. vii. Irrigated.  
   (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. No manure.  
   2. 1 ton/ac. of G.L.  
   3. 2 ton/ac. of G.L.  
   4. 3 ton/ac. of G.L.  
   5. 20 C.L.ac. of cattle dung.  
   6. 5 md/ac. of G.N.C.  
   7. 150 lb./ac. of A/S.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7. (b) N.A.  (iii) 6.  (iv) (a) and (b) 140 ac.  
   (v) Nil.  (vi) Y.s.

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

5. RESULTS:
   (i) 1478 lb./ac.  
   (ii) 123.2 lb./ac.  
   (iii) Treatments differ highly significantly.  
   (iv) Av. yield of grain in lb./ac.:
      Treatment     Av. yield
      1.          1274
      2.          1487
      3.          1447
      4.          1601
      5.          1541
      6.          1321
      7.          1674
      S.E./mean = 50.4 lb./ac.
Crop :- Paddy (Kharif).

Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'M'.

Object :—To study the effect of C/N on the yield of Paddy.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) Dorsa. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Transplanting. (c) —. (d) and (e) N.A. (v) N.A. (vi) (C. 16 medium). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 2 levels of lime : \( L_0 = 0 \) and \( L_1 = 200 \) lb./ac.
   (2) 5 levels of N as A/S : \( N_0 = 0 \), \( N_1 = 20 \) lb./ac. of N as A/S, \( N_2 = 40 \) lb./ac. of N as A/S, \( N_3 = 20 \) lb./ac. of N as C/N and \( N_4 = 40 \) lb./ac. of N as C/N.

3. DESIGN :
   (i) 2X5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

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

5. RESULTS :
   (i) 1950 lb./ac.
   (ii) 304.4 lb./ac.
   (iii) Only N effect is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
<th>( N_4 )</th>
<th>Mean</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1667</td>
<td>2138</td>
<td>2181</td>
<td>1818</td>
<td>1558</td>
<td>1932</td>
<td></td>
</tr>
<tr>
<td>1828</td>
<td>1808</td>
<td>2164</td>
<td>1954</td>
<td>2088</td>
<td>1968</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1747</td>
<td>1973</td>
<td>2172</td>
<td>1886</td>
<td>1973</td>
<td>1950</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 87.9 lb./ac.
S.E. of marginal mean of L = 55.6 lb./ac.
S.E. of body of table = 124.3 lb./ac.

Crop :- Paddy (Kharif).

Site :- Govt. Seed and Demonstration Farm, Durg. Type :- 'M'.

Object :—To compare the effect of T.C. on Paddy with other manures.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) Dorsa. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :
   1. Control (no manure).
   2. 20 lb./ac. of N as T.C.
   3. 40 lb./ac. of N as T.C.
   4. 20 lb./ac. of N as cowdung.
   5. 40 lb./ac. of N as cowdung.

3. DESIGN :
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66' x 161'. (v) Nil. (vi) N.A.
4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1949 to 1953.  (b) No. (c) Nil.  (v) (a) Raipur and B data. (b) N.A.  (vi) Nil.  (vii) Plot wise data—N.A.

5. RESULTS:
(i) 1341 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1193</td>
<td>6.</td>
<td>1351</td>
</tr>
<tr>
<td>2.</td>
<td>1350</td>
<td>7.</td>
<td>1353</td>
</tr>
<tr>
<td>3.</td>
<td>1370</td>
<td>8.</td>
<td>1338</td>
</tr>
<tr>
<td>4.</td>
<td>1331</td>
<td>9.</td>
<td>1398</td>
</tr>
<tr>
<td>5.</td>
<td>1385</td>
<td>S.E./mean = N.A.</td>
<td></td>
</tr>
</tbody>
</table>

Crop:—Paddy (Kharij).  
Site:—Govt. Seed and Demonstration Farm, Durg.  
Ref:—M.P. 50(57).  
Type:—‘M’.  
Object:—To compare the effect of T.C. on Paddy with other manures.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Dorsam. (iii) N.A.  (iv) (a) to (c) N.A.  (v) N.A.  (vi) Baisan (late).  (vii) N.A.  (viii) N.A.  (ix) N.A.  (x) N.A.

2. TREATMENTS:
1. Control (no manure).  
2. 20 lb./ac. of N as T.C.  
3. 40 lb./ac. of N as T.C.  
4. 20 lb./ac. of N as cowdung.  
5. 40 lb./ac. of N as cowdung.  
6. 20 lb./ac. of N as G.N.C.  
7. 40 lb./ac. of N as G.N.C.  
8. 10 lb./ac. of N as A.S.  
9. 20 lb./ac. of N as A.S.

3. DESIGN:
(i) R.B.D.  (ii) (a) 9. (b) N.A.  (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil.  (vi) Not properly randomized.

4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1949 to 1953.  (b) No. (c) Nil.  (v) (a) Raipur  (v)  N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 2429 lb./ac.  
(ii) 251.8 lb./ac.  
(iii) Treatments are not significantly different.  
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2321</td>
<td>6.</td>
<td>2461</td>
</tr>
<tr>
<td>2.</td>
<td>2361</td>
<td>7.</td>
<td>2356</td>
</tr>
<tr>
<td>3.</td>
<td>2428</td>
<td>8.</td>
<td>2408</td>
</tr>
<tr>
<td>4.</td>
<td>2415</td>
<td>9.</td>
<td>2481</td>
</tr>
<tr>
<td>5.</td>
<td>2448</td>
<td>S.E./mean = 102.8 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>
Crop :- Paddy (Kharij).

Site :- Govt. Seed and Demonstration Farm, Durg.  Type :- 'M'.

Object :- To find the effect of T.C. on Paddy with other manures.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Kankar in 5 replications and Dorsa in one replication.  (b) N.A.  (iii) 27.8.1951.  
   (iv) (a) N.A.  (b) Transplanting.  (c) -.  (d) and (e) N.A.  (v) N.A.  (vi) X 116 (medium).  (vii) Irrigated.  (viii) Roughing on 18.10.1951.  (ix) 39.14”.  (x) 21.11.1951.

2. TREATMENTS:
   1. Control.  6. 20 lb./ac. of N as G.N.C.
   2. 20 lb./ac. of N as T.C.  7. 40 lb./ac. of N as G.N.C.
   3. 40 lb./ac. of N as T.C.  8. 10 lb./ac. of N as A/S.
   4. 20 lb./ac. of N as cowdung.  9. 20 lb./ac. of N as A/S.
   5. 40 lb./ac. of N as cowdung.

5. DESIGN:
   (i) R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 5.  (iv) (a) and (b) 1/40 ac.  (v) N.A.  (vi) Yes,

4. GENERAL:
   (i) N.A.  (ii) N.A.  (iii) Grain and straw yield.  Av. no. of tillers.  (iv) (a) 1949-1953.  (b) No.  (c) Nil.
   (v) (a) Raipur.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1550 lb./ac.
   (ii) 254.6 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1441</td>
</tr>
<tr>
<td>2.</td>
<td>1493</td>
</tr>
<tr>
<td>3.</td>
<td>1554</td>
</tr>
<tr>
<td>4.</td>
<td>1474</td>
</tr>
<tr>
<td>5.</td>
<td>1521</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>103.9 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Paddy (Kharij).

Site :- Govt. Seed and Demonstration Farm, Durg.  Type :- 'M'.

Object :- To compare the effect of T.C. on Paddy with other manures.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Kankar.  (b) N.A.  (iii) 18.8.1952.  (iv) (a) Ploughed thrice. Levelled by working dosteri and koyer.  (b) Transplanted.  (c) -.  (d) and (e) N.A.  (v) N.A.  (vi) X 116 (medium).  (vii) Irrigated.  (viii) 2 weedings on 22.9.1952 and 9.10.1552.  (ix) N.A.  (x) 21, 23.11.1952.

2. TREATMENTS:
   1. Control.  6. 20 lb./ac. of N as G.N.C.
   2. 20 lb./ac. of N as T.C.  7. 40 lb./ac. of N as G.N.C.
   3. 40 lb./ac. of N as T.C.  8. 10 lb./ac. of N as A/S.
   4. 20 lb./ac. of N as cowdung.  9. 20 lb./ac. of N as A/S.
   5. 40 lb./ac. of N as cowdung.

Manures applied at the time of puddling.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 9.  (b) 297'×33'.  (iii) 6.  (iv) (a) and (b) 33'×33'.  (v) Nil.  (vi) No.
4. GENERAL:
(i) Satisfactory. (ii) Attack of rice bugs in the second week of September. Controlled immediately by spraying gammexane. (iii) Grain yield. (iv) (a) 1949–1953. (b) No. (c) Nil. (v) (a) Raipur, Bilaspur. (b) N.A. (vi) Nil. (vii) Randomisation not done properly.

5. RESULTS:
(i) 1527 lb./ac.
(ii) 240.5 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1364</td>
<td>6.</td>
<td>1541</td>
</tr>
<tr>
<td>2.</td>
<td>1431</td>
<td>7.</td>
<td>1661</td>
</tr>
<tr>
<td>3.</td>
<td>1544</td>
<td>8.</td>
<td>1581</td>
</tr>
<tr>
<td>4.</td>
<td>1447</td>
<td>9.</td>
<td>1567</td>
</tr>
<tr>
<td>5.</td>
<td>1564</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E.(mean) = 98.2 lb./ac.

Crop :- Paddy (Kharij).
Ref :- M.P. 53(82).
Site :- Govt. Seed and Demonstration Farm, Durg.
Type :- 'M'.

Object :- To compare the effect of T.C. on Paddy with that of other manures

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Kankar. (b) N.A. (iii) N.A. (iv) (a) Ploughed in both directions and levelled. (b) Transplanting. (c) —. (d) and (e) N.A. (v) N.A. (vi) XI16 (medium). (vii) Irrigated. (viii) N.A. (ix) N.A.

2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as cowdung.
5. 40 lb./ac. of N as cowdung.
6. 20 lb./ac. of N as G.N.C.
7. 40 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949 to 1953. (b) No. (c) N.I. (v) (a) Raipur. (u) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1546 lb./ac.
(ii) 217.3 lb./ac.
(iii) The treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1380</td>
<td>6.</td>
<td>1603</td>
</tr>
<tr>
<td>2.</td>
<td>1447</td>
<td>7.</td>
<td>1683</td>
</tr>
<tr>
<td>3.</td>
<td>1560</td>
<td>8.</td>
<td>1597</td>
</tr>
<tr>
<td>4.</td>
<td>1463</td>
<td>9.</td>
<td>1580</td>
</tr>
<tr>
<td>5.</td>
<td>1603</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E.(mean) = 88.7 lb./ac.
Crop: - Paddy (Kharif).

Site: - Govt. Seed and Demonstration Farm, Durg.

Ref: - M.P. 51(77).

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

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) Dorsa. (b) N.A. (iii) 22.8.1951. (iv) (a) N.A. (b) Transplantation. (c) - . (d) and (e) N.A. (v) Nil. (vi) X-116. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 20.11.1951.

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as G.N.C. applied at puddling.
   3. 20 lb./ac. of N as decorticated cotton seed oil cake at puddling.
   4. 20 lb./ac. of N as undecorticated cotton seed oil cake at puddling.
   5. 20 lb./ac. of N as A/S applied after transplanting.

Treatments applied at the time of puddling.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33' x 33'. (v) Nil. (vi) Randomisation not done properly.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Av. height, av. no. of tillers, grain and straw yield. (iv) (a) 1951 to 1952. (b) No. (c) Nil. (v) (a) Raipur and Bilaspur. (b) N.A. (vi) Nil. (vii) Randomisation not done properly.

5. RESULTS:
   (i) 2277 lb./ac.
   (ii) 437.0 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2000</td>
<td>=192.9 lb./ac.</td>
</tr>
<tr>
<td>2.</td>
<td>2496</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>2416</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>2232</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>2240</td>
<td></td>
</tr>
</tbody>
</table>

Crop: - Paddy (Kharif).

Site: - Govt. Seed and Demonstration Farm, Durg.

Ref: - M.P. 52(65).

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

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Matari (b) N.A. (iii) 15.8.1952. (iv) (a) Ploughing thrice. Levelling by working datari and koper. (b) Transplanting. (c) - . (d) and (e) N.A. (v) N.A. (vi) X-166 (medium), (vii) Irrigated. (viii) One weeding on 20.9.1952. (ix) 45 88'. (x) 19.11.1952.

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as G.N.C.
   3. 20 lb./ac. of N as decorticated cotton seed cake.
   4. 20 lb./ac. of N as undecorticated cotton seed cake.
   5. 20 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33' x 33'. (v) Nil. (vi) No.
4. GENERAL:
(i) Satisfactory.
(ii) There was attack of rice bug in second week of October 1952 and was controlled by spraying of gammaexane.
(iii) Grain yield.
(iv) (a) 1951-1952.
(b) No. (c) Nil. (v) (a) Raipur.
(b) N.A. (vi) Nil. (vii) Randomisation not done properly.

5. RESULTS:
(i) 2306 lb./ac.
(ii) 173.72 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2236</td>
</tr>
<tr>
<td>2</td>
<td>2432</td>
</tr>
<tr>
<td>3</td>
<td>2196</td>
</tr>
<tr>
<td>4</td>
<td>2348</td>
</tr>
<tr>
<td>5</td>
<td>2316</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>77.66 lb.</td>
</tr>
</tbody>
</table>

Crop: Paddy.

Site: Institute of Plant Industry, Indore.

Ref: M. P. 52(8).

Type: 'M'.

Object: To compare the efficacy of A/S and G.N.C. applied in graded doses with Super.

1. BASAL CONDITIONS:
(i) (a) No. (b) Sugarcane. (c) Organic manure + F compost and mixture of A/S and G.N.C. (d) Black cotton soil. (b) -.
(ii) 29.6.1952.
(iii) 21-23 June 1952.
(iv) (a) Spraying twice. (b) N.A. (c) 30 lb./ac. (d) a.
(e) N.A. (f) Nil. (g) Barwadi 22 (medium).

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of P₂O₅ as Super: P₂O₅ = 0, P₂O₅ = 15 and P₂O₅ = 30 lb./ac.
(2) 7 doses of N: N₀ = 0, N₁ = 20 lb./ac. of N as G.N.C., N₂ = 40 lb./ac. of N as G.N.C., N₃ = 60 lb./ac. of N as G.N.C., N₄ = 20 lb./ac. of N as A/S, N₅ = 40 lb./ac. of N as A/S, N₆ = 60 lb./ac. of N as A/S.

3. DESIGN:
(i) 7x3 Fact. in R.R.D.
(ii) (a) 21.
(b) N.A. (iii) 4. (iv) (a) 50'x9'4". (b) 4'x4'4". (v) 2' on either side. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952-continuing.
(b) No. (c) Nil. (y) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1037 lb./ac.
(ii) 196.1 lb./ac.
(iii) Only N effect is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>761</td>
<td>1024</td>
<td>1153</td>
<td>11348</td>
<td>1218</td>
<td>1108</td>
</tr>
<tr>
<td>693</td>
<td>1069</td>
<td>1108</td>
<td>1024</td>
<td>1020</td>
<td>1069</td>
</tr>
<tr>
<td>739</td>
<td>1050</td>
<td>834</td>
<td>1231</td>
<td>87</td>
<td>1089</td>
</tr>
</tbody>
</table>

Mean 731 1048 1052 1201 942 1125 1600 1037

S.E. of marginal mean of N = 56.7 lb./ac.
S.E. of marginal mean of P = 37.4 lb./ac.
S.E. of body of table = 96.0 lb./ac.
Crop :- Paddy.  
Site :- Institute of Plant Industry, Indore.  
Object :- To study the efficacy of A/S and G.N.C. applied in graded doses with Super.

1. BASAL CONDITIONS :  
(i) (a) No. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Bakharing twice (b) Drilled. (c) to (e) N.A. (v) Nil. (vi) Basmati. (vii) Irrigated. (viii) Hand weeding two times followed by interculture with daura. (ix) 31.95'. (x) 3.11.1953.

2. TREATMENTS :  
All combinations of (1), (2) and (3)  
(1) 4 levels of N : N₀=0, N₁=10, N₂=20 and N₃=30 lb./ac.  
(2) 2 sources of N : S₁=A/S and S₂=G.N.C.  
(2) 3 levels of P₂O₅ : P₀=0, P₁=15 and P₂=30 lb./ac.

3. DESIGN :  
(i) 3x4x2 Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv) (a) 55’x9’4”. (b) 50’x4’8”. (v) 2 rows on each side and 2’ at each end. (vi) Yes.

4. GENERAL :  
(i) Good. (ii) No. (iii) Grain yield. (iv) (a) 1952—contd. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS :  
(i) 860 lb./ac.  
(ii) 183.8 lb./ac.  
(iii) N effect is highly significant, S effect is significant while other effects are not significant.  
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
<th>S₁</th>
<th>S₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>630</td>
<td>778</td>
<td>965</td>
<td>1105</td>
<td>869</td>
<td>867</td>
<td>872</td>
</tr>
<tr>
<td>739</td>
<td>965</td>
<td>934</td>
<td>834</td>
<td>868</td>
<td>916</td>
<td>789</td>
</tr>
<tr>
<td>763</td>
<td>654</td>
<td>942</td>
<td>1019</td>
<td>844</td>
<td>914</td>
<td>774</td>
</tr>
<tr>
<td>Mean</td>
<td>711</td>
<td>799</td>
<td>947</td>
<td>986</td>
<td>860</td>
<td>909</td>
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<tr>
<td>S₁</td>
<td>835</td>
<td>1105</td>
<td>985</td>
<td>975</td>
<td>845</td>
<td></td>
</tr>
<tr>
<td>S₂</td>
<td>762</td>
<td>788</td>
<td>986</td>
<td>754</td>
<td>835</td>
<td>788</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 43.38 lb./ac.  
S.E. of marginal mean of P = 37.57 lb./ac.  
S.E. of marginal mean of S in N x S table = 35.41 lb./ac.  
S.E. of marginal mean of S in P x S table = 30.67 lb./ac.  
S.E. of body of table N x P = 75.15 lb./ac.  
S.E. of body of table N x S = 61.34 lb./ac.  
S.E. of body of table P x S = 53.12 lb./ac.

Crop :- Paddy.  
Site :- Adhartal Farm, Jabalpore.  
Object :- To study the effect of blood meal in comparison with other manures on Paddy.

1. BASAL CONDITIONS :  
(i) (a) to (c) N.A. (ii) (a) Sehra (light sandy). (b) Refer soil analysis, Jabalpore. (iii) 28.8.1951. (iv) (a) Cross ploughing and levelling. (b) Transplanted. (c) —. (d) and (e) —. A. (v) N.A. (vi) Paddy 17. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 7.11.1951.
2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N as Blood meal applied on 23.8.1951.
3. 20 lb./ac. of N as F.Y.M. applied on 23.8.1951.
4. 20 lb./ac. of N as G.N.C. applied on 23.8.1951.
5. 20 lb./ac. of N as A/S applied on 6.9.1951.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) $33 \times 33$. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good in general. But crop suffered to some extent for want of rains in second half of September and October. (ii) Nil. (iii) Grain yield. (iv) (a) 1951-1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. Season was not favourable for the crop. (vii) Nil.

5. RESULTS:
(i) 1909 lb./ac.
(ii) 1313 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Control</td>
<td>1107</td>
<td>66.6 lb./ac.</td>
</tr>
<tr>
<td>2. Blood meal</td>
<td>1235</td>
<td></td>
</tr>
<tr>
<td>3. F.Y.M.</td>
<td>1584</td>
<td></td>
</tr>
<tr>
<td>4. G.N.C.</td>
<td>1154</td>
<td></td>
</tr>
<tr>
<td>5. A/S</td>
<td>1150</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Paddy (Kharij).
Site :- Adhartal Farm, Jabalpore.
Object :- To study the effect of blood meal in comparison with other manures and fertilizers.

1. BASAL CONDITIONS:
(i) Refer soil analysis, Jabalpore. 18.7.1952. (ii) N.A. (b) Transplanting. (c) Nil. (d) and (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) 13.10.1952.

2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N as Blood meal applied on 7.7.1952.
3. 20 lb./ac. of N as F.Y.M. applied on 7.7.1952.
4. 20 lb./ac. of N as G.N.C. applied on 7.7.1952.
5. 20 lb./ac. of N as A/S applied on 29.7.1952.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) N.A. (v) 140 ac. (vi) N.A. (vii) Nil.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1234 lb./ac.
(ii) 123.2 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Control</td>
<td>1107</td>
</tr>
<tr>
<td>2. Blood meal</td>
<td>1235</td>
</tr>
<tr>
<td>3. F.Y.M.</td>
<td>1584</td>
</tr>
<tr>
<td>4. G.N.C.</td>
<td>1154</td>
</tr>
<tr>
<td>5. A/S</td>
<td>1150</td>
</tr>
</tbody>
</table>

S.E./mean = 61.6 lb./ac.
Crop :- Paddy.  
Site :- Adhartal Farm, Jabalpore.
Object :- To study the effect of bloodmeal in comparison with other manures and fertilizers.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Sehra. (b) Refer soil analysis, Jabalpore. (iii) 20.7.1953.
(iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) Paddy no. 17. (vii) Irrigated. (viii) One weeding. (ix) 24.21'. (x) 28.10.1953.

2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N as bloodmeal.
3. 20 lb./ac. of N as F.Y.M.
4. 20 lb./ac. of N as G.N.C.
5. 20 lb./ac. of N as A/S.
6. 20 lb./ac. of N as Fertilizer mixture.
Manures applied on 17.7.1953.

3. DESIGN:
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Average growth, early end of monsoon affected the good growth of the crop. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1955. (b) Yes. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) Nil. (vii) In replication 1 randomisation is not satisfactory.

5. RESULTS:
(i) 2314 lb./ac.
(ii) 423 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2161</td>
</tr>
<tr>
<td>2.</td>
<td>2277</td>
</tr>
<tr>
<td>3.</td>
<td>2151</td>
</tr>
<tr>
<td>4.</td>
<td>1938</td>
</tr>
<tr>
<td>5.</td>
<td>2414</td>
</tr>
<tr>
<td>6.</td>
<td>2344</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>211.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Paddy.  
Site :- Adhartal Farm, Jabalpore.
Object :- To study the effect of cotton seed cake on Paddy in comparison with G.N.C. and A/S.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Sehra (light sandy). (b) Refer soil analysis, Jabalpore. (iii) 24-8-1951. (i) (a) Ploughing. (b) transplanted. (c) —. (d) and (e) N.A. (v) N.A. (vi) Paddy 17. (vii) Irrigated. (viii) One weeding. (ix) N.A. (x) 25-11-1951.

3. TREATMENTS:
1. Control.
2. 20 lb./ac. of N as decorticated cotton seed cake.
3. 20 lb./ac. of N as undecorticated cotton seed cake.
4. 20 lb./ac. of N as G.N.C.
5. 20 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33' x 33'. (v) Nil. (vi) Yes.
4. GENERAL:
(i) Fair in general. But the crop suffered to some extent for want of moisture in the soil. (ii) Nil.
(iii) Weight of Grain and straw. (iv) (a) 1951 to 1953. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable to the crop. (vii) Nil.

5. RESULTS:
(i) 904.3 lb./ac.
(ii) 196.7 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>742.5</td>
</tr>
<tr>
<td>2.</td>
<td>951.0</td>
</tr>
<tr>
<td>3.</td>
<td>843.8</td>
</tr>
<tr>
<td>4.</td>
<td>1030.5</td>
</tr>
<tr>
<td>5.</td>
<td>953.9</td>
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</tbody>
</table>
S.E/mean = 88.0 lb./ac.

Crop :- Paddy.
Site :- Adhartal Farm, Jabalpore.
Object :- To study the effect of cotton cake in comparison with other manures and fertilizers on Paddy.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Sehra. (b) Refer soil analysis, Jabalpore. (iii) 23.7.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) Paddy Chatri. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N decorticated cotton seed oil cake.
3. 20 lb./ac. of N as undecorticated cotton seed oil cake.
4. 20 lb./ac. of N as G.N.C.
5. 20 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33' x 33'. (v) Nil. (vi) Yes

4. GENERAL:
(i) Satisfactory (tillering and growth was poor in plots without manure.) (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS:
(i) 1275 lb./ac.
(ii) 149.1 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1005</td>
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<tr>
<td>2.</td>
<td>1110</td>
</tr>
<tr>
<td>3.</td>
<td>1236</td>
</tr>
<tr>
<td>4.</td>
<td>1494</td>
</tr>
<tr>
<td>5.</td>
<td>1529</td>
</tr>
</tbody>
</table>
S.E/mean = 66.7 lb./ac.
Crop := Paddy.  
Site := Adhartal Farm, Jabalpore.  
Object := To study the effect of cotton cake in comparison with other manures and fertilizers on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) N.A.  (c) N.A.  (ii) (a) Domatta (Sandy loam).  (b) Refer soil analysis, Jabalpore.  (iii) 22.8.53.  (iv) (a) Ploughing and leveling.  (b) Transplanted.  (c) —.  (d) and (e) N.A.  (v) N.A.  (vi) Chatri (late).  (vii) Irrigated.  (viii) N.A.  (ix) 24.2°.  (x) 28.11.53.

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as decorticated cotton seed cake applied on 22.8.1953.
   3. 20 lb./ac. of N as undecorticated cotton seed cake applied on 22.8.1953.
   4. 20 lb/ac. of N as G.N.C. applied on 22.8.1953.
   5. 20 lb./ac. of N as A/S applied on 6.10.1953.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 5. (b) N.A.  (iii) 4.  (iv) (a) & (b) 33’x33’.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Not good. Crop failed to grow well due to late rains and early cessation of rain.  (ii) N.A.  (iii) Grain and straw yield.  (iv) (a) 1951 to 1953.  (v) (a) Raipur.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1177 lb./ac.
   (ii) 379.6 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1544</td>
</tr>
<tr>
<td>2.</td>
<td>841</td>
</tr>
<tr>
<td>3.</td>
<td>1217</td>
</tr>
<tr>
<td>4.</td>
<td>1319</td>
</tr>
<tr>
<td>5.</td>
<td>962</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>169.7 lb./ac.</td>
</tr>
</tbody>
</table>

Crop := Paddy.  
Site := Adhartal Farm, Jabalpore.  
Object := To study the effect of N and P while applied alone and in combination on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) & (c) N.A.  (ii) (a) Sehra (light sandy).  (b) Refer soil analysis, Jabalpore.  (iii) 10.8.1951.  (iv) (a) Two ploughings and leveling.  (b) Transplanted.  (c) —.  (d) & (e) N.A.  (v) N.A.  (vi) Paddy no. 17.  (vii) Irrigated.  (viii) 1 weeding.  (ix) N.A.  (x) 12.11.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 5 levels of P_2O_5 as Super : P_0=0, P_1=15, P_2=30, P_3=45 and P_4=60 lb./ac.
   (2) 3 levels of N as A/S : N_0=0, N_1=15 and N_2=30 lb./ac.

3. DESIGN:
   (i) 5x3 Fact. in R.B.D.  (ii) (a) 15.  (b) N.A.  (iii) 3.  (iv) (a) and (b) 1/80 ac.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) N.A.  (iii) No. of tillers, grain and straw yield.  (iv) (a) 1951 to 1953.  (b) Yes.  (c) N.A.  (v) (a) and (b) N.A.  (vi) Irrigation was insufficient. Weather was not favourable to the crop.  (vii) Nil.
5. RESULTS:

(i) 2396 lb./ac.
(ii) 96.00 lb./ac.
(iii) All the effects are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
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<td>2058</td>
<td>2277</td>
<td>2317</td>
<td>2463</td>
<td>2179</td>
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<td>2457</td>
<td>2627</td>
<td>2500</td>
<td>2742</td>
<td>2570</td>
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<td>N₂</td>
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<td>2163</td>
<td>2420</td>
<td>2333</td>
<td>2387</td>
<td>2431</td>
</tr>
<tr>
<td>Mean</td>
<td>2362</td>
<td>2283</td>
<td>2369</td>
<td>2473</td>
<td>2473</td>
<td>2396</td>
</tr>
</tbody>
</table>

S.E of marginal mean of N = 24.8 lb./ac.
S.E. of marginal mean of P = 32.0 lb./ac.
S.E. of body of table = 55.4 lb./ac.

Crop :- Paddy (Kharif).
Site :- Adhartal Farm, Jabalpore.

Object :- To study the effect of N and P while applied alone and in combination on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Refer soil, analysis, Jabalpore. (iii) 2.8.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) Paddy No. 17. (vii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2):
   (1) 5 levels of P₂O₅ as Super : P₀=0, P₁=15, P₂=30, P₃=45 and P₄=60 lb./ac.
   (2) 3 levels of N as A/S : N₀=0, N₁=15 and N₂=30 lb./ac.

3. DESIGN
   (i) 5×3 Factor in R.B.D. (ii) 15. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 23×16². (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) Attack of bug noticed in all plots in general, the plots were dusted at a uniform rate by gammexane, damage caused was negligible and practically uniform in all plots. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1355 lb./ac.
   (ii) 104 lb./ac.
   (iii) Only N and P effects are highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>Mean</th>
</tr>
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<td>1227</td>
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<td>1280</td>
<td>1190</td>
<td>1345</td>
<td>1418</td>
<td>1499</td>
<td>1350</td>
</tr>
<tr>
<td>N₂</td>
<td>1400</td>
<td>1482</td>
<td>1547</td>
<td>1592</td>
<td>1642</td>
<td>1533</td>
</tr>
<tr>
<td>Mean</td>
<td>1249</td>
<td>1273</td>
<td>1357</td>
<td>1419</td>
<td>1475</td>
<td>1355</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 26.85 lb./ac.
S.E. of marginal mean of P = 34.67 lb./ac.
S.E. of body of table = 60.04 lb./ac.
Crop: Paddy.  
Site: Adhartal Farm, Jabalpore.

Object: To study the effect of N and P applied alone and in combination.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Schra. (b) Refer soil analysis, Jabalpore. (iii) 6.7.1953. (iv) (a) Ploughing and levelling. (b) Transplanted. (c) - (d) and (e) N.A. (v) N.A. (vi) Paddy 
No. 17 (early). (vii) Irrigated. (viii) 24.21*. (x) 6.11.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 5 levels of P₂O₅ as Super: P₀ = 0, P₁ = 15, P₂ = 30, P₃ = 45 and P₄ = 60 lb./ac.
(2) 3 levels of N as A/S: N₀ = 0, N₁ = 15 and N₂ = 30 lb./ac.

3. DESIGN:
(i) 3 x 5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 33' X 16'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. The plots where higher doses of A/S were given showed vigorous growth and leaves were broad, deep and green in colour. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) Yes. (c) N.A. (v) (a) Raipur. (b) N.A (vi) and (vii) Nil.

RESULTS:
(i) 182 lb./ac. (ii) 220 lb./ac. (iii) Only P effect is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
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<tr>
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<td>1814</td>
<td>1673</td>
<td>1761</td>
<td>2160</td>
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<td>1158</td>
<td>1660</td>
<td>1922</td>
<td>1807</td>
<td>1726</td>
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<tr>
<td>N₂</td>
<td>2006</td>
<td>1866</td>
<td>1720</td>
<td>1655</td>
<td>1918</td>
<td>1833</td>
</tr>
<tr>
<td>Mean</td>
<td>2058</td>
<td>1613</td>
<td>1684</td>
<td>1802</td>
<td>1562</td>
<td>1824</td>
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</tbody>
</table>

S.E. of marginal mean of N
S.E. of marginal mean of P
S.E. of body cf table

Ref: M.P. 50(22).  
Type: 'M'.

Crop: Paddy.  
Site: Adhartal Farm, Jabalpore.

Object: To study the effect of leaves as G.M. on Paddy.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Schra. (b) Refer soil analysis, Jabalpore. (iii) 1.8.1950. (iv) (a) Ploughing and puddling. (b) Transplanted. (c) - (d) and (e) N.A. (v) N.A. (vi) Sulta gurmat.a. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 24.11.1950.

2. TREATMENTS:
All combinations of (1) and (2)+a control
(1) 3 levels of green leaves: L₁ = 1, L₂ = 2 and L₃ = 3 ton/ac.
(2) 2 sources of green leaves: S₁ = Pipal and S₂ = Mahuva.

3. DESIGN:
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 24' X 30'. (v) N.A. (vi) Yes.

4. GENERAL:
5. RESULTS:
(i) 1365 lb./ac.
(ii) 71.40 lb./ac.
(iii) L and 'control vs other treatments effects' are highly significant. Other effects are not significant.
(iv) Av. yield of grain in lb./ac.

Control = 1036 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₁</th>
<th>L₂</th>
<th>L₃</th>
<th>Mean</th>
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<td>1579</td>
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</tr>
<tr>
<td>Mean</td>
<td>1268</td>
<td>1393</td>
<td>1600</td>
<td>1370</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of L = 25.24 lb./ac.
S.E. of marginal mean of S = 20.61 lb./ac.
S.E. of body of table = 35.0 lb./ac.

Crop := Paddy.
Site := Adhartal Farm, Jabalpore.
Object := To find out the effect of leaves as G.M. on Paddy.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Sehra (light sandy).  (b) Ref.: soil analysis, Jabalpore  (iii) 28.8.1951.  (v)
(a) 2 ploughings and levellings.  (b) Transplanted.  (c) -  (d) and (e) N.A.  (ix) N.A.  (x) 16,17.11.1951.
(vi) Irrigated.  (vii) 1 weeding.  (ix) N.A.  (x) Sulta.
(ii) Irrigated.  (viii) 1 weeding.  (ix) N.A.  (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2) + a control
(1) 3 levels of green leaves : L₁ =1, L₂ =2 and L₃ =3 ton./ac.
(2) 2 sources of green leaves : S₁ = Pipal and S₂ = Mahura.

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

4. GENERAL:
(i) Normal.  (ii) N.A.  (iii) Grain and straw yield.  (iv) (a) 1950-953 lb./ac.  (b) N.A.  (c) N.A.  (v)
(a) N.A.  (b) N.A.  (vi) As monsoon started late, transplanting was delayed. Scanty rains during rainy season were unfavourable to the crop.  (vii) Nil.

5. RESULTS:
(i) 1374 lb./ac.
(ii) 210.4 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

Control = 1170 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₁</th>
<th>L₂</th>
<th>L₃</th>
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<tr>
<td>Mean</td>
<td>1354</td>
<td>1379</td>
<td>1491</td>
<td>1401</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of L = 74.4 lb./ac.
S.E. of marginal mean of S = 60.7 lb./ac.
S.E. of body of table = 105.2 lb./ac.
Crop : Paddy (Kharif).
Site :- Adhartal Farm, Jabalpore.

Object :- To find out the effect of leaves as G.M. on Paddy.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Sehra.  (b) Refer soil analysis, Jabalpore.  (iii) 7.8.1952.  (iv) (a) N.A.  (b) Transplanted.  (c) —.  (d) and (e) N.A.  (v) N.A.  (vi) Sultu gurmatia (late).  (vii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)+control
   (1) 3 levels of green leaf: L_1=1, L_2=2 and L_3=3 ton/ac.
   (2) 2 sources of green leaf: S_1=Pippal and S_2=Mahwa.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 33' x 33'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory.  (ii) N.A.  (iii) Grain and fodder yield.  (iv) (a) 1950 to 1953.  (b) and (c) N.A.  (v) (a) and (b) N.A.  (vi) There was heavy rain of 17" for 12 hours on 25.8.1952.  (vii) In plots with Tr 3 in repl 1 and treatment no. 1 in repl II nearly 20% of the area, has been washed away by rains on 25.8.1952 and similarly nearly 16% of area of plot with treatment 5 in repl III and nearly 12½% of area in plot with treatment 6 in repl IV has been washed away due to rains. Hence the yields of these plots were estimated by missing plot technique.

5. RESULTS:
   (i) 1380 lb./ac.
   (ii) 151.5 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of grain in lb./ac.
   Treatment  | Av. yield |
   L_0S_1    | 1081     |
   L_1S_1    | 1286     |
   L_2S_1    | 1303     |
   L_3S_1    | 1566     |
   L_1S_2    | 1322     |
   L_2S_2    | 1478     |
   L_3S_2    | 1534     |
   S.E. of difference of two means
   = 107.1 lb./ac.
   = 119.1 lb./ac.
   = 135.5 lb. tac.
4. GENERAL:

(i) N.A.  (ii) N.A.  (iii) Grain and straw yield.  (iv) (a) 1950 to 1953.  (b) and (c) N.A.  (v) (a) Raipur.  
(b) N.A.  (vi) and (vii) Nil.

J. RESULTS:

(i) 3433 lb./ac.
(ii) 429.2 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>3432</td>
<td>3307</td>
<td>3277</td>
<td>3339</td>
</tr>
<tr>
<td></td>
<td>3435</td>
<td>4005</td>
<td>3140</td>
<td>3527</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of L = 151.7 lb./ac.
S.E. of marginal mean of S = 123.9 lb./ac.
S.E. of body of table = 214.6 lb./ac.

Crop: Paddy.
Site: Adhartal Farm, Jabalpore.

Object: To study the residual effect of N applied during the previous year.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Paddy.  (c) As per treatments.  (ii) (a) Sehra.  (b) Refer soil analysis, Jabalpore.  (iii) 13, 14.8.1949.  (iv) (a) 2 ploughings, puddling, levelling with darari and 3 patera.  (b) Transplanted.  (c) N.A.
(d) Plant to plant 4".  (e) N.A.  (f) Nil.  (g) Paddy No. 17 (early).  (h) Irrigated.  (i) Nil.  (j) N.A.  (k) 9.11.1949.

2. TREATMENTS:

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. F.Y.M. at 20 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.
6. G.N.C. at 10 lb./ac. of N.
7. G.N.C. at 20 lb./ac. of N.
8. A/S at 10 lb./ac. of N.
9. A/S at 20 lb./ac. of N.

Treatments applied to previous crop of paddy.

3. DESIGN:

(i) R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (l) 65' x 16.5'.  (v) N.A.  (vi) Yes.

4. GENERAL:


5. RESULTS:

(i) 542.3 lb./ac.
(ii) 217.1 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>473.2</td>
<td>6.</td>
<td>687.0</td>
</tr>
<tr>
<td>2.</td>
<td>573.6</td>
<td>7.</td>
<td>570.3</td>
</tr>
<tr>
<td>3.</td>
<td>556.9</td>
<td>8.</td>
<td>514.2</td>
</tr>
<tr>
<td>4.</td>
<td>580.3</td>
<td>9.</td>
<td>467.8</td>
</tr>
<tr>
<td>5.</td>
<td>460.2</td>
<td>S.E./mean</td>
<td>88.6 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Paddy.  
Site: Adhartal Farm, Jabalpore.  

Object: To study the residual effect of N (applied to previous Paddy crop) on the succeeding Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Paddy. (c) As per treatments.  
   (ii) (a) Sehra. (b) Refer soil analysis, Jabalpore.  
   (iii) 29.7.1950.  
   (iv) (a) Ploughing and puddling. (b) Transplanted. (c) - . (d) and (e) N.A.  
   (v) Nil.  
   (vi) Paddy No. 17.  
   (vii) Irrigated.  
   (viii) One weeding.  
   (ix) N.A.  
   (x) 2.11.1950.

2. TREATMENTS:
   1. Control.  
   2. T.C. at 20 lb./ac. of N.  
   3. T.C. at 40 lb./ac. of N.  
   4. F.Y.M. at 20 lb./ac. of N.  
   5. F.Y.M. at 40 lb./ac. of N.  
   6. G.N.C. at 10 lb./ac. of N  
   7. G.N.C. at 20 lb./ac. of N.  
   8. A/S at 10 lb./ac. of N.  
   9. A/S at 20 lb./ac. of N.  

Treatments applied to previous paddy crop.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 9. (b) N.A.  
   (iii) 6. (iv) (a) and (b) 66''x16.5''. (v) Nil.  
   (vi) Yes.

4. GENERAL:
   (i) Good in general in the beginning but at later stage the growth of the crop was checked for want of moisture in the soil.  
   (ii) N.A.  
   (iii) Grain and straw yield.  
   (iv) (a) 1949—N.A. (b) N.A.  
   (v) The season was most unfavourable to crop.  
   (vi) Nil.

5. RESULTS:
   (i) 1816 lb./ac.  
   (ii) 150 4 lb./ac.  
   (iii) Treatments differ highly significantly.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1534</td>
<td>6.</td>
<td>1701</td>
</tr>
<tr>
<td>2.</td>
<td>1694</td>
<td>7.</td>
<td>1848</td>
</tr>
<tr>
<td>3.</td>
<td>2008</td>
<td>8.</td>
<td>1661</td>
</tr>
<tr>
<td>4.</td>
<td>1868</td>
<td>9.</td>
<td>1901</td>
</tr>
<tr>
<td>5.</td>
<td>2048</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 61.2 lb./ac.

Crop: Paddy.  
Site: Adhartal Farm, Jabalpore.  

Object: To study the residual effect of N (applied to previous paddy crop) on the succeeding Paddy crop.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Paddy. (c) As per treatments.  
   (ii) (a) Sehra (light sandy). (b) Refer soil analysis, Jabalpore.  
   (iii) 11.8.1951.  
   (iv) (a) Ploughing. (b) Transplanted. (c) - . (d) and (e) N.A.  
   (v) Nil.  
   (vi) Paddy No. 17.  
   (vii) Irrigated.  
   (viii) One weeding.  
   (ix) N.A.  
   (x) 9.11.1951.

2. TREATMENTS:
   1. Control.  
   2. T.C. at 20 lb./ac. of N.  
   3. T.C. at 40 lb./ac. of N.  
   4. F.Y.M. at 20 lb./ac. of N.  
   5. F.Y.M. at 40 lb./ac. of N.  
   6. G.N.C. at 10 lb./ac. of N  
   7. G.N.C. at 20 lb./ac. of N.  
   8. A/S at 10 lb./ac. of N.  
   9. A/S at 20 lb./ac. of N.  

Treatments applied to the previous crop.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 9. (b) N.A.  
   (iii) 6. (iv) (a) and (b) 49.5'x22'. (v) No.  
   (vi) Yes.
4. GENERAL:

(i) Fair and uniform. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949 N.A. (b) N.A (v) (a) and (b) N.A (vi) Season was unfavourable for the crop. (vii) Nil.

5. RESULTS:

(i) 155 lb./ac.
(ii) 22.9 lb./ac.
(iii) Treatments do not differ significantly.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1097</td>
<td>6.</td>
<td>1332</td>
</tr>
<tr>
<td>2.</td>
<td>1462</td>
<td>7.</td>
<td>1390</td>
</tr>
<tr>
<td>3.</td>
<td>1447</td>
<td>8.</td>
<td>1253</td>
</tr>
<tr>
<td>4.</td>
<td>1420</td>
<td>9.</td>
<td>1295</td>
</tr>
<tr>
<td>5.</td>
<td>1450</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 93 lb./ac.

Crop: Paddy (Kharif).

Site: Adhartal Farm, Jabalpur.

Object: To study the residual effect of N applied to previous Paddy crop on the succeeding Paddy crop.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Paddy. (c) As per treatments. (ii) (a) Sehra. (b) Refer soil analysis, Jabalpur. (iii) 9,10,11,1952. (iv) (a) and (b) N.A. (v) N.A. (vi) Paddy No. 17. (vii) N.A. (viii) N.A. (ix) N.A. (x) 22 23.10.1952.

2. TREATMENTS:

1. Control.
2. T.C. at 20 lb./ac. of N.
3. T.C. at 40 lb./ac. of N.
4. F.Y.M. at 20 lb./ac. of N.
5. F.Y.M. at 40 lb./ac. of N.

Treatments applied to paddy crop during kharif 1951-1952.

3. DESIGN:

(i) (a) N.A. (b) 9. (c) N.A. (d) 1/49 ac. (e) N.A. (f) Yes.

4. GENERAL:

(i) The crop was quite satisfactory in the beginning but later all the pots turned yellow due to continuous rains and cloudy weather in September. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949-1952 (b) N.A. (c) N.A. (d) and (e) N.A. (vi) Nil.

RESULTS:

(i) 1440 lb./ac.
(ii) 176.3 lb./ac.
(iii) Treatments differ highly significantly.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1205</td>
<td>6.</td>
<td>1493</td>
</tr>
<tr>
<td>2.</td>
<td>1350</td>
<td>7.</td>
<td>1607</td>
</tr>
<tr>
<td>3.</td>
<td>1602</td>
<td>8.</td>
<td>1244</td>
</tr>
<tr>
<td>4.</td>
<td>1568</td>
<td>9.</td>
<td>1281</td>
</tr>
<tr>
<td>5.</td>
<td>1607</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 71.96 lb./ac.
Crop:- Paddy.  
Site :- Adhartal Farm, Jabalpore.

Ref :- M.P. 49(51).

Type :- 'M'.

Object :- To study the comparative effect of T.C. as compared to other fertilizers on Paddy.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) (a) Sehra.  (b) Refer soil analysis, Jabalpore.  (iii) 4, 5, 8, 1949.  (v) (a) 2 ploughings in July 1949, 1 ploughing by Motson plough, levelling by dateril and puddling.  (b) Transplanted.  (c) ——.  (d) 4'.  (e) 2 to 3.  (v) Nil.  (vi) Paddy No. 17 (early).  (vii) Irrigated.  (viii) 1 weedisp.  (ix) N.A.  (x) 3, 4, 11, 1949.

2. TREATMENTS :
   1. Control.  
   2. T.C. at 20 lb./ac. of N.  
   3. T.C. at 40 lb./ac. of N.  
   4. C.M. at 20 lb./ac. of N.  
   5. C.M. at 40 lb./ac. of N.  
   Treatments 2 to 7 applied on 24.7.1949 and treatments 8 and 9 applied on 29.8.1949.

3. DESIGN :
   (i) R.B.D. (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) 6x32'.  (b) 6x16.5'.  (v) N.A.  (vi) Yes.

4. GENERAL :
   (i) Good.  (ii) Nil.  (iii) Weight of bundle and grain yield.  (iv) (a) 1946 = N.A.  (b) N.A.  (c) N.A.  (v) (a) Raipur, Bilaspur.  (b) N.A.  (vi) Transplanting delayed on account of scanty rains in July.  (vii) Nil

5. RESULTS :
   (i) 1723 lb/ac.  
   (ii) 280.5 lb/ac.  
   (iii) Treatments do not differ significantly.

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

   Treatment  
   Av. yield  
   Treatment  
   Av. yield  
   1. 1564 6. 1739  
   2. 1592 7. 1838  
   3. 1789 8. 1656  
   4. 1714 9. 1844  
   5. 1739  

   S.E./mean = 114.4 lb/ac.

---

Crop :- Paddy.  
Site :- Adhartal Farm, Jabalpore.

Ref :- M.P. 50(21).

Type :- 'M'.

Object :- To study the effect of T.C. in comparison with F.Y.M., G.N.C. and A/S on Paddy.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) (a) Sehra (light sandy).  (b) Refer soil analysis, Jabalpore.  (iii) 28.7.1950.  (iv) (a) N.A.  (b) Transplanted.  (c) ——.  (d) and (e) N.A.  (v) N.A.  (vi) Paddy No. 17.  (vii) Irrigated.  (viii) N.A.  (ix) N.A.  (x) 28-10.1950.

2. TREATMENTS :
   1. Control.  
   2. T.C. at 20 lb./ac. of N.  
   3. T.C. at 40 lb./ac. of N.  
   4. F.Y.M. at 20 lb./ac. of N.  
   5. F.Y.M. at 40 lb./ac. of N.  

3. DESIGN :
   (i) R.B.D. (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) 49.5' x 22'.  (b) Nil.  (vi) Yes.

4. GENERAL :
   (i) Growth and tillering retarded for want of sufficient water.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1946 = N.A.  (b) N.A.  (c) N.A.  (v) (a) and (b) N.A.  (vi) The season was most unfavourable to the crop.  (vii) Nil
5. RESULTS:
(i) 1148 lb/ac.
(ii) 108.0 lb/ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb/ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>857</td>
<td>6.</td>
<td>1061</td>
</tr>
<tr>
<td>2.</td>
<td>1014</td>
<td>7.</td>
<td>1107</td>
</tr>
<tr>
<td>3.</td>
<td>1294</td>
<td>8.</td>
<td>1181</td>
</tr>
<tr>
<td>4.</td>
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<td>9.</td>
<td>1383</td>
</tr>
<tr>
<td>5.</td>
<td>1254</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 44.00 lb/ac.

Crop: Paddy.

Site: Adhartal Farm, Jabalpore.

Ref: M.P. 51(37).

Object: To study the effect of T.C. in comparison with F.Y.M., G.N.C., and A/S on Paddy.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (b) Refer soil analysis, Jabalpore. (iv) (a) Solma (light sandy loam).
(ii) (a) Ploughing and puddling. (b) Transplanted. (c) to (e) N.A. (vi) Paddy No. 17. (vii) Irrigated.
(iii) 22.1951.

2. TREATMENTS:
1. Control. 6. G.N.C. at 10 lb/ac. of N.
2. T.C. at 20 lb/ac. of N. 7. G.N.C. at 20 lb/ac. of N.
3. T.C. at 40 lb/ac. of N. 8. A/S at 10 lb/ac. of N.
4. F.Y.M. at 20 lb/ac. of N. 9. A/S at 20 lb/ac. of N.
5. F.Y.M. at 40 lb/ac. of N.

3. DESIGN:
(i) R.B.D. (ii) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66' x 16.5'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Not satisfactory. Scanty rains checked the growth of the crop. (ii) N.A. (iii) Grain and straw yield. (iv) (a) Irrigation not satisfactory.
(b) No. (c) N.A. (v) a) and (b) N.A. (vi) Season was not favorable to the crop. (vii) Nil.

5. RESULTS:
(i) 1637 lb/ac.
(ii) 342.0 lb/ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb/ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1660</td>
<td>6.</td>
<td>1619</td>
</tr>
<tr>
<td>2.</td>
<td>1669</td>
<td>7.</td>
<td>1687</td>
</tr>
<tr>
<td>3.</td>
<td>1792</td>
<td>8.</td>
<td>1553</td>
</tr>
<tr>
<td>4.</td>
<td>1609</td>
<td>9.</td>
<td>1737</td>
</tr>
<tr>
<td>5.</td>
<td>1710</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 139.2 lb/ac.

Crop: Paddy.

Site: Adhartal Farm, Jabalpore.

Ref: M.P. 53(71).

Object: To study the effect of C/N in comparison with A/S, with and without Lime, on Paddy.

1. BASAL CONDITIONS:
(i) (a) N.I. (b) and (c) N.A. (ii) (a) Solma (sandy). (b) Refer soil analysis, Jabalpore. (iii) 22.7.1952.
(iv) (a) Ploughing. (b) Transplanted. (c) to (e) N.A. (v) N.A. (vi) Paddy No. 17 (early), (vii) Irrigated. (vii) One weeding. (ix) 24.21°. (x) 13 to 15.10.1953.
2. **TREATMENTS**:

All combinations of (1) and (2)

(1) 2 levels of lime: $L_0 = 0$ and $L_1 = 200$ lb./ac.

(2) 5 manures: $M_0 = 0$, $M_1 = 20$ lb./ac. of N as A/S, $M_2 = 40$ lb./ac. of N as A/S, $M_3 = 20$ lb./ac. of N as C/N and $M_4 = 40$ lb./ac. of N as C/N.

3. **DESIGN**:

(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. **GENERAL**:

(i) Good. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953 to 1955. (b) Yes. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) Nil. (vii) The randomisation in replication I is not satisfactory.

5. **RESULTS**:

(i) 2845 lb./ac.

(ii) 349.7 lb./ac.

(iii) Only M effect is highly significant.

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

<table>
<thead>
<tr>
<th></th>
<th>$M_0$</th>
<th>$M_1$</th>
<th>$M_2$</th>
<th>$M_3$</th>
<th>$M_4$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_0$</td>
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<td>2862</td>
<td>3367</td>
<td>2375</td>
<td>2841</td>
<td>2853</td>
</tr>
<tr>
<td>$L_1$</td>
<td>2591</td>
<td>2935</td>
<td>3136</td>
<td>2780</td>
<td>2738</td>
<td>2836</td>
</tr>
<tr>
<td>Mean</td>
<td>2706</td>
<td>2899</td>
<td>3252</td>
<td>2578</td>
<td>2790</td>
<td>2845</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of $M$ = 100.9 lb./ac.

S.E. of marginal mean of $L$ = 63.8 lb./ac.

S.E. of body of table = 142.5 lb./ac.

---

**Crop**: Paddy.

**Site**: Labhandi Farm, Raipur.

**Ref**: M.P. 50(44).

**Type**: 'M'.

Object: To find out the maximum potential yield of Paddy by the application of increasing doses of Ammo. Phos.

1. **BASAL CONDITIONS**:


2. **TREATMENTS**:

   5 doses of N as Ammo. Phos.: $N_0 = 0$, $N_1 = 100$, $N_2 = 200$, $N_3 = 300$ and $N_4 = 400$ lb./ac.

3. **DESIGN**:

   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 66' × 16'. (v) Nil. (vi) Yes.

4. **GENERAL**:

   (i) Satisfactory, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:

   (i) 2186 lb./ac.

   (ii) 265.3 lb./ac.

   (iii) Treatments differ highly significantly.
Crop :- Paddy.  
Site :- Labhandi Farm, Raipur.

Object :- To study the residual effect of manures applied to Paddy during 1951-52 on succeeding Paddy crop.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Dorsa. (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) Sowing by hāri method. (c) to (e) N.A. (v) Nil. (vi) Lachnai x gummatis x Burma (very late). (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :
1. Control. 2. T.C. at 20 lb./ac. of N. 3. T.C. at 40 lb./ac. of N. 4. Cattledung at 20 lb./ac. 5. Cattledung at 40 lb./ac. 6. G.N.C. at 10 lb./ac. 7. G.N.C. at 20 lb./ac. 8. A/S at 10 lb./ac. of N. 9. A/S at 20 lb./ac. of N. 10. A/S at 20 lb./ac. of N + Super at 20 lb./ac. of P₂O₅.

3. DESIGN :
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 66' 16''. (v) Nil. (vi) Yes.

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

5. RESULTS:
(i) 1666 lb./ac. (ii) 310.4 lb./ac. (iii) Treatments do not differ significantly.

Crop :- Paddy.  
Site :- Labhandi Farm, Raipur.  
Ref :- M.P. 53(51).  
Type :- 'M'.  
Object :- To find out the effect of N manures on Paddy.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Maasai. (b) N.A. (iii) 22.8.1953. (iv) (a) Ploughing. (b) Transplanted. (c) --. (d) and (e) N.A. (vi) Nil. (vii) Cross 116 x Burma x Luchai No. 18. (viii) Irrigated. (ix) N.A. (x) 28.11.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of lime : L₀ = 0, L₁ = 200 lb./ac.
(2) 5 doses of N : N₀ = 0, N₁ = 20 lb./ac. of N as A/S, N₂ = 40 lb./ac. of N as A/S, N₃ = 20 lb./ac. of N as C/N and N₄ = 40 lb./ac. of N as C/N.
3. DESIGN:
(i) R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 1/40 ac.  (v) Nil.  (vi) Yes.

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

5. RESULTS:
(i) 1994 lb./ac.
(ii) 315.3 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>L0</td>
<td>1941</td>
<td>1981</td>
<td>1908</td>
<td>1914</td>
<td>2088</td>
<td>1966</td>
</tr>
<tr>
<td>L1</td>
<td>2028</td>
<td>2201</td>
<td>2048</td>
<td>1914</td>
<td>1921</td>
<td>2022</td>
</tr>
<tr>
<td>Mean</td>
<td>1948</td>
<td>2091</td>
<td>1974</td>
<td>1914</td>
<td>2004</td>
<td>1994</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 91.0 lb./ac.
S.E. of marginal mean of L = 57.6 lb./ac.
S.E. of body of table = 128.7 lb./ac.

Crop :- Paddy.
Site :- Labhandi Farm, Raipur.

Object :- To ascertain the manurial value of Cotton seed oil cake.

Ref :- M.P. 51(69).
Type :- 'M'.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Paddy.  (c) N.A.  (iii) (a) Dorsa soil.  (b) N.A.  (iii) 25.7.1951.  (iv) (a) Ploughing by Meston plough follow by wooden datari and koper just before transplantation.  (b) Transplanted.  (c)—.  (d) 4' apart.  (e) N.A.  (v) Nil.  (vi) Cross No. 116 × Burma 28 (medium).  (vii) Irrigated.  (viii) Weeding.  (ix) N.A.  (x) 20.11.1951.

2. TREATMENTS:
1. No manure.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as decorticated cotton seed oil cake.
4. 20 lb./ac. of N as undecorticated cotton seed oil cake.
5. 20 lb./ac. of N as A/S.

Manures applied on 25.7.1951.

3. DESIGN:
(i) R.B.D.  (ii) (a) 5.  (b) N.A.  (iii) 5.  (iv) (a) and (b) 66′ × 16 ḟ′.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) Good growth.  No lodging.  (ii) Nil.  (iii) Grain and straw yield.  (iv) (a) 1951-1952.  (b) and (c)—.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 2177 lb./ac.
(ii) 227.3 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1944</td>
</tr>
<tr>
<td>2</td>
<td>2268</td>
</tr>
<tr>
<td>3</td>
<td>2186</td>
</tr>
<tr>
<td>4</td>
<td>2276</td>
</tr>
<tr>
<td>5</td>
<td>2212</td>
</tr>
</tbody>
</table>

S.E./mean = 101.6 lb./ac.
Crop :- Paddy.
Site :- Labhandi Farm, Raipur.
Ref :- M.P. 52(51).
Type :- 'M'.

Object :- To study the manurial value of A/S/N in comparison with A/S.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Matasi soil. (b) N.A. (iii) 31.8.1952. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) Luchai x gurnatia (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 30.11.1952.

2. TREATMENTS :
   1. No manure.
   2. 40 lb./ac. of N as A/S.
   3. 40 lb./ac. of N as A/S/N.

3. DESIGN :
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 66'x16'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) Severe attack of Aphids as a result of which fertilization was not proper. (iii) Grain yield.
   (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1221 lb./ac.
   (ii) 124.9 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment Av. yield
   1. 1216
   2. 1280
   3. 1168
   S.E./mean = 56.0 lb./ac.

---

Crop :- Paddy.
Site :- Labhandi Farm, Raipur.
Ref :- M.P. 53(50)
Type :- 'M'.

Object :- To ascertain the best combination of organic manures and artificial fertilizers for Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Matasi (b) N.A. (iii) 28.3.1953. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) N.A. (v) Nil. (vi) Luchai x gurnatia (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 28.11.1953.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 doses of manures : M1 = 40 lb./ac. of N + 40 lb./ac. of P2O5, M2 = 60 lb./ac. of N + 60 lb./ac. of P2O5 and M3 = 80 lb./ac. of N + 80 lb./ac. of P2O5.
   (2) 4 ratios of A/S and F.Y.M. in N : R1 = 4 : 6, R2 = 3 : 1, R3 = 1 : 1 and R4 = 1 : 3.
   P2O5 applied as Super.

3. DESIGN :
   (i) 3×4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

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

5. RESULTS :
   (i) 2354 lb./ac.
   (ii) 255.3 lb./ac.
   (iii) Main effect of M alone is significant.
Crop :- Paddy.
Site :- Labhandi Farm, Raipur.

Object :- To ascertain the effect of mixture of oil cake and fertilizers on Paddy.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Paddy. (c) N.A. (i) (a) Matasi. (b) N.A. (iii) 1.9.1953. (iv) (a) Ploughing. (b) Transplanted. (c) - (d) and (e) N.A. (v) Nil. (vi) Luchai×gurmatia (No. 18) (Inte). (vii) Irrigated. (viii) Weedimg. (ix) N.A. (x) 29.11.1953.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 doses of manures : M₁ = 40 lb./ac. of N+40 lb./ac. of P₂O₅, M₂ = 60 lb./ac. of N+60 lb./ac. of P₂O₅ and M₃ = 80 lb./ac. of N+80 lb./ac. of P₂O₅.
   (2) 4 ratios of oil cake and A/S in N : R₁ = 0 : 4, R₂ = 3 : 1, R₃ = 1 : 1 and R₄ = 1 : 3. P₂O₅ applied as Super.

3. DESIGN :
   (i) 3 x 4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

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

5. RESULTS:
   (i) 2204 lb./ac.
   (ii) 224.0 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>R₁</td>
<td>1974</td>
<td>2214</td>
<td>2314</td>
<td>2167</td>
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<td>R₂</td>
<td>2231</td>
<td>2188</td>
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<td>2239</td>
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<td>R₃</td>
<td>2154</td>
<td>2194</td>
<td>2294</td>
<td>2214</td>
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<tr>
<td>R₄</td>
<td>2108</td>
<td>2368</td>
<td>2108</td>
<td>2194</td>
</tr>
<tr>
<td>Mean</td>
<td>2114</td>
<td>2241</td>
<td>2256</td>
<td>2204</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of M = 45.6 lb./ac.
S.E. of marginal mean of R = 53.1 lb./ac.
S.E. of body of table = 91.3 lb./ac.
Crop: Paddy.
Site: Labhandi Farm, Raipur.

Object: To find out the effect of Mahwa cake on the yield of Paddy as compared to O.N.C.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Matasi soil. (b) N.A. (iii) 21.6.1951. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c)—. (d) and (e) N.A. (v) N.A. [vi] 
   Irrigated. (vii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)+a control
   (1) 2 sources of N : \( S_1 = \text{Mahwa cake} \) and \( S_2 = \text{G.N.C.} \)
   (2) 2 levels of N: \( N_1 = 20 \) and \( N_2 = 40 \) lb./ac. Manures applied on 3.9.1950.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

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

5. RESULTS:
   (i) 2018 lb./ac.
   (ii) 291.9 lb./ac.
   (iii) Control vs others and N effects are highly significant. Other effects are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_1 )</td>
<td>1900</td>
<td>1960</td>
<td>1930</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>2084</td>
<td>2412</td>
<td>2248</td>
</tr>
<tr>
<td>Mean</td>
<td>1992</td>
<td>2186</td>
<td>2089</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 92.3 lb./ac.
S.E. of body of table = 130.5 lb./ac.

Crop: Paddy.
Site: Labhandi Farm, Raipur.

Object: To find the effect of Mahwa cake on the yield of Paddy as compared to G.N.C.

Ref: M.P. 50(42).
Type: 'M'.

Ref: M.P. 51(65).
Type: 'M'.
4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2111 lb./ac.
(ii) 363.6 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1455</td>
</tr>
<tr>
<td>2.</td>
<td>2243</td>
</tr>
<tr>
<td>3.</td>
<td>2072</td>
</tr>
</tbody>
</table>
S.E./mean = 87.7 lb./ac.

Object:—To ascertain the effect of deep application of fertilisers to transplanted Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (i) (a) Matasi. (b) N.A. (ii) 27.8.1952. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) Usually 4' x 4'. (e) N.A. (v) Nil. (vi) Luchaix Burma (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 30.11.1952.

2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N+20 lb./ac. of P₂O₅ applied 3' deep.
3. 20 lb./ac. of N+20 lb./ac. of P₂O₅ applied on surface.
Manures applied on 26.8.1952.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 16' x 67'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1923 lb./ac.
(ii) 196.1 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1455</td>
</tr>
<tr>
<td>2.</td>
<td>2243</td>
</tr>
<tr>
<td>3.</td>
<td>2072</td>
</tr>
</tbody>
</table>
S.E./mean = 87.7 lb./ac.

Object:—To ascertain the effect of deep placement of fertilisers on Paddy.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Paddy. (c) N.A. (i) (a) Matasi. (b) N.A. (iii) 28.8.1953. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) N.A. (v) 10 cwt/ac. of F.Y.M. (vi) Luchaix gurnatia No. 18 (late) (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 29.11.1953.
2. TREATMENTS:
   1. 20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super applied at surface.
   2. 20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super applied 3" deep.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 5. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2424 lb./ac.
   (ii) 372 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2328</td>
<td>166.4 lb./ac.</td>
</tr>
<tr>
<td>2.</td>
<td>2520</td>
<td></td>
</tr>
</tbody>
</table>

   Crop :-Paddy.
   Site :-Labhandi Farm, Raipur.
   Ref :-M.P. 50(43).
   Type :-'M'.

Object :-To find out the effect of G.L. (karanj) leaves on Paddy.

1. BASAL CONDITIONS:
   (i) (e) Nil. (b) Paddy. (c) N.A. (ii) (a) Dorsa. (b) N.A. (iii) 10.9.1950. (iv) (a) Field puddled with Mestc and wooden datari followed by working of kooer just before transplanting. (b) Transplanting. (c) —. (d) 4"—5". (e) N.A. (v) Nil. (vi) Luchaitx gurmatia (late). (vii) Irrigated. (viii) Weeding. (ix) 38°. (x) 29.11.1950.

2. TREATMENTS:
   4 doses of G.L.: G₂=0, G₁=1, G₂=2 and G₃=3 ton./ac.
   G.L. as karanj leaves buried just before planting.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 32'x13'-7". (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good growth, no lodging. (ii) Nil. (iii) Grain and straw yield. iv) (a) 1951 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1380 lb./ac.
   (ii) 309.7 lb./ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>G₀</td>
<td>1080</td>
<td>138.5 lb./ac.</td>
</tr>
<tr>
<td>G₁</td>
<td>1300</td>
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<tr>
<td>G₂</td>
<td>1340</td>
<td></td>
</tr>
<tr>
<td>G₃</td>
<td>1780</td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>128.5 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>
Object: To find out the effect of G.L. (karanj leaves) on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Dorsa soil. (b) N.A. (iii) 23.7.1951. (iv) (a) Ploughing with Meston plough followed by datari and koper just a day before transplanting. (b) Transplanted. (c) —. (d) Between plants 4'. (e) N.A. (v) N.A. (vi) Cross No. 116 x Burma No. 11. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 18.11.1951.

2. TREATMENTS:
   4 doses of G.L.: G₀ = 0, G₁ = 1, G₂ = 2, and G₃ = 3 ton/ac. G.L. as karanj leaves.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 17' x 25' (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good growth, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950 to 1952. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 2580 lb./ac. (ii) 320.5 lb./ac. (iii) Treatments are not significantly different. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>G₀</td>
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<tr>
<td>G₂</td>
<td>2600</td>
</tr>
<tr>
<td>G₃</td>
<td>2880</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>143.3 lb./ac.</td>
</tr>
</tbody>
</table>

Object: To find the effect of G.L. (karanj leaves) on the yield of Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Dorsa. (b) N.A. (iii) 17.8.1952. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) 4' x 4'. (e) N.A. (v) N.A. (vi) Luchai No. 2 x gurmatia (late) x Burma. (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS:
   4 doses of G.L.: G₀ = 0, G₁ = 1, G₂ = 2 and G₃ = 3 ton/ac. G.L. applied on 17.8.1952.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 17' x 25'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1952. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 3067 lb./ac. (ii) 274.1 lb./ac. (iii) Treatment differences are significant.
Crop: Paddy.
Site: Labhandi Farm, Raipur.
Ref: M.P. 48(28).
Type: 'M'.

Object: To study the effect of manuring Paddy with T.C. and other manures.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Matasi (sandy loam). (b) N.A. (iii) N.A. (iv) (a) Ploughing
   (b) to (c) N.A. (v) Nil. (vi) Cross 116 (medium). (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. No manure.
   2. 20 lb./ac. of N as T.C.
   3. 40 lb./ac. of N as T.C.
   4. 20 lb./ac. of N as Cowdung.
   5. 40 lb./ac. of N as Cowdung.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66'x16.5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) and (c) No. (v) Bilaspur. (b) N.C.
   (vi) Nil. (vii) Plotwise yield data N.A.

5. RESULTS:
   (i) 95 lb./ac.
   (ii) N.A.
   (iii) N.A.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>676</td>
<td>6.</td>
<td>777</td>
</tr>
<tr>
<td>2.</td>
<td>773</td>
<td>7.</td>
<td>972</td>
</tr>
<tr>
<td>3.</td>
<td>1139</td>
<td>8.</td>
<td>768</td>
</tr>
<tr>
<td>4.</td>
<td>860</td>
<td>9.</td>
<td>934</td>
</tr>
<tr>
<td>5.</td>
<td>1154</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = N.A.

---

Crop: Paddy.
Site: Labhandi Farm, Raipur.
Ref: M.P. 49(39).
Type: 'M'.

Object: To study the effect of T.C. and other fertilisers on Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Matasi (sandy loam). (b) N.A. (iii) N.A. (iv) (a) Ploughing
   (b) to (c) N.A. (v) Nil. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. No manure.
   2. 20 lb./ac. of N as T.C.
   3. 40 lb./ac. of N as T.C.
   4. 20 lb./ac. of N as Cowdung.
   5. 43 lb./ac. of N as Cowdung.
3. DESIGN:
(i) R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 66’×16.5’.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1948 to 1950.  (b) and (c) No.  (v) (a) Bilaspur.  (b) No.  (vi) Nil.  (vii) Plotwise yield data N.A.

5. RESULTS:
(i) 924 lb/ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>741</td>
<td>6.</td>
<td>856</td>
</tr>
<tr>
<td>2.</td>
<td>774</td>
<td>7.</td>
<td>949</td>
</tr>
<tr>
<td>3.</td>
<td>1011</td>
<td>8.</td>
<td>934</td>
</tr>
<tr>
<td>4.</td>
<td>860</td>
<td>9.</td>
<td>1195</td>
</tr>
<tr>
<td>5.</td>
<td>994</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = N.A.

Crop :- Paddy.

Site :- Labhandi Farm, Raipur.

Object :-To study the effect of T.C. on Paddy as compared to other manures.

1. BASAL CONDITIONS:

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb/ac. of N as T.C.
   3. 40 lb/ac. of N as T.C.
   4. 20 lb/ac. of N as Cattle dung.
   5. 40 lb/ac. of N as Cattle dung.

Treatments 2 to 5 applied on 29.6.1950 and treatments 6 to 9 applied on 13.8.1950.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 66’×16.5’.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Good. No lodging.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1948 to 1950.  (b) and (c) No.  (v) (a) Bilaspur.  (b) No.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 1138 lb/ac.
   (ii) 165.5 lb/ac.
   (iii) Treatments are highly significantly different.
   (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>987</td>
<td>6.</td>
<td>1181</td>
</tr>
<tr>
<td>2.</td>
<td>1121</td>
<td>7.</td>
<td>1114</td>
</tr>
<tr>
<td>3.</td>
<td>1434</td>
<td>8.</td>
<td>1021</td>
</tr>
<tr>
<td>4.</td>
<td>904</td>
<td>9.</td>
<td>1207</td>
</tr>
<tr>
<td>5.</td>
<td>1181</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 67.6 lb/ac.
Crop :- Paddy.  
Site :- Labhandi Farm, Raipur. 

Object :- To study the residual effect of T.C. and other fertilisers applied to Paddy during 1948-1949.

1. BASAL CONDITIONS :  
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Mauro (sandy loam). (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) to (e) N.A. (v) Nil. (vi) Cross 116 (medium). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :  
   1. Control.  
   2. T.C. at 20 lb/ac. of N.  
   3. T.C. at 40 lb/ac. of N.  
   4. Cattle dung at 20 lb/ac. of N.  
   5. Cattle dung at 40 lb/ac. of N.  
   Applied to paddy during 1949-1949.

3. DESIGN :  
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

4. GENERAL :  
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949-1951. (b) and (c) No. (v) Nil. (vi) Nil. (vii) Plot wise yield data N.A.

5. RESULTS :  
   (i) 537.7 lb/ac.  
   (ii) N.A.  
   (iii) N.A.  
   (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>412</td>
</tr>
<tr>
<td>2.</td>
<td>471</td>
</tr>
<tr>
<td>3.</td>
<td>647</td>
</tr>
<tr>
<td>4.</td>
<td>538</td>
</tr>
<tr>
<td>5.</td>
<td>604</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>-N.A.</td>
</tr>
</tbody>
</table>

Crop :- Paddy.  
Site :- Labhandi Farm, Raipur.  

Object :- To study the residual effect of T.C. and other fertilisers applied to Paddy during 1949-1950.

1. BASAL CONDITIONS :  
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Durra-Kashir. (b) N.A. (iii) 15.7.1950. (iv) (a) Ploughing and cross ploughings. (b) Sown by bias method. (c) N.A. (d) - . (e) N.A. (f) Nil. (g) Cross 116 (medium). (h) Irrigated. (i) Weeding. (j) 38'. (k) 20.11.1950.

2. TREATMENTS :  
   1. Control.  
   2. T.C. at 20 lb/ac. of N.  
   3. T.C. at 40 lb/ac. of N.  
   4. Cattle dung at 20. lb/ac. of N.  
   5. Cattle dung at 40 lb/ac. of N.  
   Applied to paddy during 1949-50.

3. DESIGN :  
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66' × 16'. (v) Nil. (vi) Yes.

4. GENERAL :  
   (i) Good growth; no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1949 to 1951. (b) N.A. (c) No. (d) Nil. (e) Bilaspur. (f) No. (g) and (h) Nil.
5. RESULTS:
(i) 955.6 lb./ac.
(ii) 153.3 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>960</td>
</tr>
<tr>
<td>2.</td>
<td>1120</td>
</tr>
<tr>
<td>3.</td>
<td>1040</td>
</tr>
<tr>
<td>4.</td>
<td>840</td>
</tr>
<tr>
<td>5.</td>
<td>920</td>
</tr>
</tbody>
</table>

S/E. mean = 62.6 lb./ac.

Crop: Paddy. Site: Labhandi Farm, Raipur.

Ref: M.P. 51(70).

Type: 'M'.

Object: To study the residual effect of T.C. and other fertilizers applied to Paddy during 1950-51.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) As per treatments.
(ii) (a) Dorsa soil. (b) N.A. (iii) 17.6.1951.
(iv) (a) Ploughing with meston plough to prepare seed bed just after monsoon. (b) Broadcast and mixed by peg harrow. (c) 100 lb./ac. (d) and (e) Nil.
(ix) N.A. (x) 20.11.1951.

2. TREATMENTS:

(i) No manure.
(ii) T.C. at 20 lb./ac. of N.
(iii) T.C. at 40 lb./ac. of N.
(iv) Cattle dung at 20 lb./ac. of N.
(v) Cattle dung at 40 lb./ac. of N.

3. DESIGN:

(i) R.B.D. (ii) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66'x164'.

4. GENERAL:

(i) Good growth. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 to 1950. (b) No. (c) No.
(iv) (a) N.A. (b) No. (vi) and (vii) Nil.

5. RESULTS:

(i) 812.6 lb./ac.
(ii) 201.4 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>837.1</td>
</tr>
<tr>
<td>2.</td>
<td>880.4</td>
</tr>
<tr>
<td>3.</td>
<td>997.2</td>
</tr>
<tr>
<td>4.</td>
<td>750.4</td>
</tr>
<tr>
<td>5.</td>
<td>833.8</td>
</tr>
</tbody>
</table>

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

Crop: Paddy. Site: Labhandi Farm, Raipur.

Ref: M.P. 51(71).

Type: 'M'.

Object: To study the effect of T.C. on Paddy as compared to other fertilisers.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Paddy. (c) As per treatments except treatment No. 10.
(ii) (a) Dorsa. (b) N.A. (iii) 17.6.1951.
(iv) (a) Two ploughings with meston plough to prepare the seed bed just after break of monsoon. (b) Broadcast and mixed with peg harrow. (d) and (e) Nil.
2. TREATMENTS:
1. Control (no manure). 6. 10 lb./ac. of N as G.N.C.
2. 20 lb./ac. of N as T.C. 7. 20 lb./ac. of N as G.N.C.
3. 40 lb./ac. of N as T.C. 8. 10 lb./ac. of N as A/S.
4. 20 lb./ac. of N as Cattle dung. 9. 20 lb./ac. of N as A/S.
5. 40 lb./ac. of N as Cattle dung. 10. Tr. 9+20 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super.
Treatments 2 to 5 applied on 1.6.1951 and treatments 6 to 10 applied on 1.8.1951.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 66' x 16'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good growth, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951 to 1952. (b) Yes. (v) No. (vi) (a) N.A. (b) No. (vii) and (viii) Nil.

5. RESULTS:
(i) 768.4 lb./ac. (ii) 234.2 lb./ac. (iii) Treatments not significantly different.

Crop: Paddy.
Site: Labhandi Farm, Raipur.
Ref: M.P. 52(47)/51(71).
Type: ‘M’.

Object: To study the effect of T.C. on Paddy as compared to other manures.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Dorna. (c) N.A. (iii) 27.7.1952. (iv) (a) Ploughing. (b) Soar by bosi method. (c) to (e) N.A. (v) Nil. (vi) Cross 116 (\textit{bhonuda x parvva}) (medium). (vii) Irrigation. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
1. Control (no manure). 6. 10 lb./ac. of N as G.N.C.
2. 20 lb./ac. of N as T.C. 7. 20 lb./ac. of N as G.N.C.
3. 40 lb./ac. of N as T.C. 8. 10 lb./ac. of N as A/S.
4. 20 lb./ac. of N as Cattle dung. 9. 20 lb./ac. of N as A/S.
5. 40 lb./ac. of N as Cattle dung. 10. Tr. 9+20 lb./ac. of P\textsubscript{2}O\textsubscript{5} as Super.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 66’ x 16’. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good growth. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951 to 1952. (b) Yes. (v) No. (vi) (a) N.A. (b) No. (vii) and (viii) Nil.

5. RESULTS:
(i) 768.4 lb./ac. (ii) 234.2 lb./ac. (iii) Treatments not significantly different.
Crop: Paddy.
Site: Central Res. Farm, Ujjain.

Object: To find out a suitable dose of manure for Paddy under rainfed conditions.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Peas. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.7.1950. (iv) (a) Bakharings. (b) and (c) N.A. (d) 18' between two rows. (e) —, (v) F.Y.M. at 5 C.L./ac. was broadcasted at the time of last bakharing. (vi) C.F. Paddy (early). (vii) Unirrigated. (viii) One weeding and interculturing. Top dressing with A/S in fourth block. (ix) 36.78'. (x) 30.10.1950.

2. TREATMENTS:
   1. No manure (control).
   2. G.N.C. at 20 lb./ac. of N.
   3. G.N.C. at 40 lb./ac. of N.
   4. G.N.C. at 60 lb./ac. of N.
   5. A/S at 20 lb./ac. of N.
   6. A/S at 40 lb./ac. of N.
   7. A/S at 60 lb./ac. of N.
   8. G.N.C. and A/S in 1 : 1 ratio at 20 lb./ac. of N.
   9. G.N.C. and A/S in 1 : 1 ratio at 40 lb./ac. of N.
   10. G.N.C. and A/S in 1 : 1 ratio at 60 lb./ac. of N.
   11. A/S at 20 lb./ac. of N + Super at 10 lb./ac. of P_2O_5
   12. A/S at 40 lb./ac. of N + Super at 10 lb./ac. of P_2O_5
   13. A/S at 20 lb./ac. of N + Super at 20 lb./ac. of P_2O_5
   14. A/S at 40 lb./ac. of N + Super at 40 lb./ac. of P_2O_5

3. DESIGN:
   (i) R.B.D. (ii) (a) 14. (b) N.A. (iii) N.A. (iv) (a) 18' x 66'. (b) 9' x 66'. (v) 4.5' x 3'. (vi) Yes.

4. GENERAL:
   (i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950—1951. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1110 lb./ac.
   (ii) 243.6 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>792</td>
<td>8.</td>
<td>1048</td>
</tr>
<tr>
<td>2.</td>
<td>1235</td>
<td>9.</td>
<td>1014</td>
</tr>
<tr>
<td>3.</td>
<td>1336</td>
<td>10.</td>
<td>1049</td>
</tr>
<tr>
<td>4.</td>
<td>1170</td>
<td>11.</td>
<td>1185</td>
</tr>
<tr>
<td>5.</td>
<td>911</td>
<td>12.</td>
<td>1084</td>
</tr>
<tr>
<td>6.</td>
<td>1130</td>
<td>13.</td>
<td>1256</td>
</tr>
<tr>
<td>7.</td>
<td>1094</td>
<td>14.</td>
<td>1235</td>
</tr>
</tbody>
</table>

S.E./mean = 121.8 lb./ac.
Crop: Paddy.  
Ref: M.P. 53(77).

Site: Govt. Seed and Demonstration Farm, Waraseoni.  Type: 'M'.

Object: To find out the suitability of fertilizer mixture in comparison with A/S and oil cake.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Paddy. (c) N.A.  
   (ii) (a) and (b) N.A.  
   (iii) 197.1953.  
   (iv) (a) Once ploughing. (b) Transplanting. (c) —. (d) and (e) N.A.  
   (v) N.A.  
   (vi) *Luchai* × *perpusilla* × Burma (late). (vii) N.A.  
   (viii) N.A. (ix) N.A. (x) N.A.

2. **TREATMENTS**:
   1. Control.
   2. Fertilizer mixture at 20 lb./ac. of N as A/S + 2 lb./ac. of **P₂O₅** as Super.
   3. 20 lb./ac. of N as G.N.C.
   4. 20 lb./ac. of N as A/S.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 66' x 15'. (v) Nil. (vi) N.A.

4. **GENERAL**:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) Original yield data and analysis of variance table are not available. Results collected from annual report.

5. **RESULTS**:
   (i) 3061 lb./ac.
   (ii) N.A.
   (iii) N.A.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield
   --- | ---
   1. | 2530
   2. | 3405
   3. | 3075
   4. | 3235

---

Crop: Paddy.  
Ref: M.P. 53(91).

Site: Govt. Seed and Demonstration Farm, Waraseoni.  Type: 'M'.

Object: To study the effect of fertilizer mixture in comparison with G.N.C.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a), (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) Nil. (vi) to (c) N.A.

2. **TREATMENTS**:
   1. 20 lb./ac. of N as A/S.
   2. 20 lb./ac. of N as G.N.C.
   3. 20 lb./ac. of N as fertilizer mixture.
   4. Control.

3. **DESIGN**:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (v) b/140 ac. (vi) N.A. (vii) Yes.

4. **GENERAL**:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) N.A.

5. **RESULTS**:
   (i) 2974 lb./ac.
   (ii) 222.7 lb./ac.
   (iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3235</td>
</tr>
<tr>
<td>2.</td>
<td>3075</td>
</tr>
<tr>
<td>3.</td>
<td>3045</td>
</tr>
<tr>
<td>4.</td>
<td>2530</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>111.3 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Paddy.  
Ref :- M.P. 51(82).

Site :- Govt. Seed and Demonstration Farm, Waraseoni. Type :- ‘M’.

Object :- To study the suitability of Cotton seed cake as a manure in comparison with G.N.C. and A/S.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  
   (ii) (a) and (b) N.A.  
   (iii) 16.6.1951/6.9.1951.  
   (iv) (a) to (e) N.A.  
   (v) N.A.  
   (vi) Luchai.  
   (vii) Unirrigated.  
   (viii) N.A.  
   (ix) N.A.  
   (x) 2.12.1951.

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as G.N.C.
   3. 20 lb./ac. of N as Cotton seed cake.
   4. 20 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 4.  
   (b) N.A.  
   (iii) 5.  
   (iv) (a) and (b) 66’X 16’.  
   (v) Nil.  
   (vi) Yes.

4. GENERAL:
   (i) Even growth.  
   (ii) Nil.  
   (iii) Grain and straw yield.  
   (iv) (a) 1951-52.  
   (b) and (c) N.A.  
   (v) (a) and (b) N.A.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 2028 lb./ac.  
   (ii) 624.8 lb./ac.  
   (iii) Treatment differences are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1712</td>
</tr>
<tr>
<td>2.</td>
<td>2112</td>
</tr>
<tr>
<td>3.</td>
<td>2048</td>
</tr>
<tr>
<td>4.</td>
<td>2240</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>279.4 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Paddy (Kharij).  
Ref :- M.P. 50(84).

Site :- Govt. Seed and Demonstration Farm, Waraseoni. Type :- ‘M’.

Object :- To determine the fertilising value of Mahwa cake.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  
   (ii) (a) to (b) N.A.  
   (iii) 19.8.1950.  
   (iv) (a) to (e) N.A.  
   (v) N.A.  
   (vi) Luchai.  
   (vii) Unirrigated.  
   (viii) N.A.  
   (ix) N.A.  
   (x) 30.11.1950.

2. TREATMENTS:
   1. Control (no manure).
   2. Mahwa cake at 11.83 lb./ac. of N.
   3. Mahwa cake at 23.66 lb./ac. of N.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 3.  
   (b) N.A.  
   (iii) 5.  
   (iv) (a) and (b) 33’X 31’.  
   (v) Nil.  
   (vi) Yes.
4. GENERAL:
(i) N.A.  (ii) Attack by *pachydiplosi cryzae* (due to unhealthy growth of crop. (iii) N.A.  (iv) (a) 1930—N.A.  (b) and (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1731 lb./ac.
(ii) 415.5 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1912</td>
</tr>
<tr>
<td>2</td>
<td>1848</td>
</tr>
<tr>
<td>3</td>
<td>1432</td>
</tr>
</tbody>
</table>

S.E./mean = 185.8 lb./ac.

---

Crop : Paddy (*Kharif*).

Ref: M.P. 52(68).

Site: Govt. Seed and Demonstration Farm, Waraseoni. Type: ‘M’.

Object: To find out the suitability of A/S/N and G.N.C. given on equal N basis.

1. BASAL CONDITIONS:
(i) (a) N.A.  (b) Wheat. (c) N.A.  (ii) (a) and (b) N.A.  (iii) 18.7.1952.  (iv) (a) Ploughed and cross ploughed. (b) Transplanted. (c) ---. (d) and (e) N.A.  (v) N.A.  (vi) Lachai × Gurmatia (late). (vii) Irrigated. (viii) N.A.  (ix) 38.52".  (x) 12, 13.12.1952.

2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as A/S/N.
4. 20 lb./ac. of N as A/S.

Applied just before transplanting and after puddling.

3. DESIGN:
(i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 99’×11’.  (v) Nil.  (vi) N.A.

4. GENERAL:
(i) Not good.  (ii) Incidence of Badia.  (iii) Grain yield.  (iv) (a) to (c) N.A.  (v) (a) and (b) N.A.  (vi) The season was quite normal.  (vii) In one replication the yield for treatment 1 has not been recorded and the same is estimated by missing plot technique and analysed. It appears that nitrate nitrogen in A/S/N was washed out and G.N.C. was not available and thus giving superiority to A/S.

5. RESULTS:
(i) 2664 lb./ac.
(ii) 2656 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2556</td>
</tr>
<tr>
<td>2</td>
<td>2639</td>
</tr>
<tr>
<td>3</td>
<td>2659</td>
</tr>
<tr>
<td>4</td>
<td>2824</td>
</tr>
</tbody>
</table>

S.E. of diff. of two means one containing the missing plot = 267.77 lb./ac.
S.E. of two means none of them containing missing plot value = 187.84 lb./ac.
Crop : Paddy (Kharif).
Ref : M.P. 52(69).
Site : Govt. Seed and Demonstration Farm, Waraseoni. Type : ‘M’.

Object :-To find out the best time for sowing sannhemp as G.M. for next Paddy crop.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Sannhemp as G.M. (ii) (a) and (b) N.A. (iii) N.A. (iv) (a) Ploughing and cross ploughing. (b) Transplanted. (c)—. (d) and (e) N.A. (v) N.A. (vi) Sultangurmatia (late). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :
   1. Sannhemp sown on 17.3.1952.
   2. Sannhemp sown on 3.4.1952.
   4. Sannhemp sown on 1.5.1952.

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) and (b) 66‘×16’’. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) Incidence of Badia. (iii) Grain yield. (iv) (a) and (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) Season was not favourable for the crop. (vii) Raw data N.A.

5. RESULTS :
   (i) 880.4 lb./ac.
   (ii) N.A.
   (iii) N.A.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>831.9</td>
</tr>
<tr>
<td>2.</td>
<td>795.6</td>
</tr>
<tr>
<td>3.</td>
<td>1148.1</td>
</tr>
<tr>
<td>4.</td>
<td>746.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

---

Crop : Paddy (Kharif).
Ref : M.P. 53(78).
Site : Govt. Seed and Demonstration Farm, Waraseoni. Type : ‘M’.

Object :-To find the value of C/N in comparison with A/S on Paddy.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 25, 26.7.1953. (iv) (a) Ploughing and cross ploughing. (b) Transplanting. (c)—. (d) and (e) N.A. (v) N.A. (vi) Cross 22. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 2 levels of lime : L₀ =0 and L₁ =20 lb./ac.
   (2) 5 levels of N : N₀ =0, N₁ =20 lb./ac. of N as A/S, N₂ =40 lb./ac. of N as A/S, N₃ =20 lb./ac. of N as C/N and N₄ =40 lb./ac. of N as C/N.

3. DESIGN :
   (i) 2×5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) Raipur. (b) Nil. (vi) and (vii) Nil.
5. RESULTS:

(i) 3090 lb./ac.
(ii) 882.2 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>L₀</td>
<td>2713</td>
<td>3139</td>
<td>2919</td>
<td>3026</td>
<td>3039</td>
<td>2967</td>
</tr>
<tr>
<td>L₁</td>
<td>2866</td>
<td>3339</td>
<td>2973</td>
<td>3952</td>
<td>2933</td>
<td>3213</td>
</tr>
<tr>
<td>Mean</td>
<td>2789</td>
<td>3239</td>
<td>2946</td>
<td>3489</td>
<td>2966</td>
<td>3090</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of L = 161.1 lb./ac.
S.E. of marginal mean of N = 254.7 lb./ac.
S.E. of body of table = 360.2 lb./ac.

Crop: - Paddy (Kharif).  Ref: - M.P. 52(58).
Site: - Harsi Experimental Farm, Bagwai.  Type: - 'C'.

Object: - To find the optimum spacing and the number of seedlings per hole for Paddy crop.

1. BASAL CONDITIONS:

(i) (a) Nil.  (b) Sugarcane.  (c) Sannhemp as G.M. and dressing with A/S at 30 lb./ac.  (ii) (a) Clay loam.
(b) Refer soil analysis, Bagwai.  (iii) 31.7.1952 to 2.8.1952.  (iv) (a) Ploughing by zabul plough.  Two
puddlings after spreading compost and third puddling before transplanting.  (b) Transplanting.  (c) ...
(d) and (e) As per treatments.  (v) A/S at 30 lb./ac.  (vi) T. 21 (medium).  (vii) Irrigated.  (viii) One
weeding.  (ix) 27.98°.  (x) 25.11.1952.

2. TREATMENTS:

Main-plot treatments:
3 row spacings: R₁ = 6", R₂ = 9" and R₃ = 12".

Sub-plot treatments:
3 plants spacings: C₁ = 3", C₂ = 6" and C₃ = 9".

Sub-Sub-plot treatments:
No. of seedlings/hole: S₁ = 1, S₂ = 2, S₃ = 3, S₄ = 4, S₅ = 5 and S₆ = 6 seedlings/hole.

3. DESIGN:

(i) Split-plot.  (ii) (a) 3 main-plots/block : 3 sub-plots/main-plot : 6 sub-sub-plots/sub-plot.  (b) N.A.
(iii) 6.  (iv) (a) 24" x 4", 24" x 4", 24" x 5" for R₁, R₂ and R₃ spacings.  (b) 20" x 3".  (v) One row on each
side and 2" at each end of sub-plot.  (vi) Yes.

4 GENERAL:

(i) N.A.  (ii) Slight attack of stem borer in all the plots.  Loss is not much.  (iii) Grain and straw yield.
(a) 1952-1954.  (b) N.A.  (c) N.A.  (iv) (a) and (b) N.A.  (v) and (vi) Nil.

5. RESULTS:

(i) 2390 lb./ac.
(ii) 580.9 lb./ac.
(b) 410.7 lb./ac.
(c) 164.4 lb./ac.

(iii) S effect and interactions R x S, C x S and R x C x S are highly significant.  Other effects are not
significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R_1</th>
<th>R_2</th>
<th>R_3</th>
<th>Mean</th>
<th>C_1</th>
<th>C_2</th>
<th>C_3</th>
</tr>
</thead>
<tbody>
<tr>
<td>S_1</td>
<td>2070</td>
<td>2165</td>
<td>2063</td>
<td>2099</td>
<td>2095</td>
<td>2145</td>
<td>2098</td>
</tr>
<tr>
<td>S_2</td>
<td>2303</td>
<td>2295</td>
<td>2234</td>
<td>2277</td>
<td>2393</td>
<td>2513</td>
<td>2197</td>
</tr>
<tr>
<td>S_3</td>
<td>2468</td>
<td>2366</td>
<td>2325</td>
<td>2386</td>
<td>2409</td>
<td>2436</td>
<td>2383</td>
</tr>
<tr>
<td>S_4</td>
<td>2486</td>
<td>2485</td>
<td>2331</td>
<td>2500</td>
<td>2566</td>
<td>2640</td>
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<td>S_5</td>
<td>2448</td>
<td>2668</td>
<td>2483</td>
<td>2533</td>
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<td>2468</td>
<td>2593</td>
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<tr>
<td>S_6</td>
<td>2577</td>
<td>2537</td>
<td>2524</td>
<td>2546</td>
<td>2549</td>
<td>2569</td>
<td>2529</td>
</tr>
<tr>
<td>Mean</td>
<td>2392</td>
<td>2419</td>
<td>2360</td>
<td>2390</td>
<td>2425</td>
<td>2374</td>
<td>2372</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. R marginal means = 79.1 lb./ac.
2. C marginal means = 55.8 lb./ac.
3. S marginal means = 31.6 lb./ac.
4. S means at the same level of R = 54.8 lb./ac.
5. R means at the same level of S = 93.6 lb./ac.
6. S means at the same level of C = 54.8 lb./ac.
7. C means at the same level of S = 74.9 lb./ac.
8. C means at the same level of R = 96.5 lb./ac.
9. R means at the same level of C = 111.8 lb./ac.

Crop :- Paddy.
Site :- Harsi Experimental Farm, Bagwai.
Ref :- M.P. 49(48).
Type :- 'C'.

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

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Sugarcane. (c) Nil. (ii) (a) Clay Loam. (b) Refer soil analysis, Bagwai. (iii) N.A. (iv) (a) Ploughing by *sabul* plough, *patila*, ploughing by disc plough and puddling before sowing. (b) to (e) As per treatments (v) Nil. (vi) *Banmati* (early). (vii) Irrigated. (viii) Weeding once. (ix) N.A. (x) N.A.

2. TREATMENTS :
All combinations of (1) and (2) + 2 extra treatments
(1) 3 spacings: = C_1=6", C_2=9" and C_3=12".
(2) No. of seedlings/hole = S_1=3, S_2=4, S_3=5 and S_4=6.
2 extra treatments are: T_1=Broadcasting paddy at 30 sr./ac. and T_2=Broadcasting paddy at 40 sr./ac.

3. DESIGN :
(i) R.B.D. (ii) N.A. (iii) 14. (b) N.A. (iii) 2. (iv) (a) and (b) 80'x18'. (v) Nil. (vi) Yes.

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

5. RESULTS :
(i) 2444 lb./jac.
(ii) 553.1 lb./jac.
(iii) Extra vs other treatments effect is highly significant. No other effect is significant.
(iv) Av. yield of grain in lb./ac.

\[ T_1 = 1155 \text{ lb./ac.} \]
\[ T_2 = 875 \text{ lb./ac.} \]

<table>
<thead>
<tr>
<th></th>
<th>( C_1 )</th>
<th>( C_2 )</th>
<th>( C_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>2415</td>
<td>3018</td>
<td>2756</td>
<td>2730</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>3062</td>
<td>247</td>
<td>2318</td>
<td>2616</td>
</tr>
<tr>
<td>( S_3 )</td>
<td>2717</td>
<td>2782</td>
<td>3045</td>
<td>2848</td>
</tr>
<tr>
<td>( S_4 )</td>
<td>2367</td>
<td>2528</td>
<td>2712</td>
<td>2536</td>
</tr>
<tr>
<td>Mean</td>
<td>2640</td>
<td>2699</td>
<td>2708</td>
<td>2682</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of \( C \)

S.E. of marginal mean of \( S \)

S.E. of body of table

\[ = 196.2 \text{ lb./ac.} \]
\[ = 226.6 \text{ lb./ac.} \]
\[ = 392.0 \text{ lb./ac.} \]

---

**Crop: Paddy.**

**Site: Labhandi Farm, Raipur.**

**Ref.: M.P. 51(64).**

**Type: 'C'.**

Object: To study the effect of plant to plant spacing on the yield of Paddy.

---

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi*. (b) N.A. (iii) N.A. (iv) (a) Ploughing and cross ploughing with meson plough followed by *dari* and *koper* just before transplantation. (b) Transplanted, (c) (d) As per treatments. (e) N.A. (f) *Luchai × gurnamia* No. 18 late. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 25.12.1951.

2. **TREATMENTS:**
   3 plant to plant spacings: \( S_1 = 4' \), \( S_2 = 6' \) and \( S_3 = 9' \).

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 9' × 12'. (v) Nil. (vi) Yes.

4. **GENERAL:**
   (i) N.A. (ii) N.A. (iii) N.A. (iv) (a) 1951 to 1953. (a) and (c) N.A. (v) (a) and (c) N.A. (vi) and (vi) Nil.

5. **RESULTS:**
   (i) 2633 lb./ac.
   (ii) 1212 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>3380</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>2380</td>
</tr>
<tr>
<td>( S_3 )</td>
<td>2140</td>
</tr>
</tbody>
</table>

S.E./mean = 542.4 lb./ac.

---

**Crop: Paddy.**

**Site: Labhandi Farm, Raipur.**

**Ref.: M.P. 52(50).**

**Type: 'C'.**

Object: To find out the effect of plant to plant spacing on the yield of Paddy.

---

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi* soil. (b) N.A. (iii) 27.8.1952. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) As per treatments. (v) N.A. (vi) *Luchai × gurnamia* × Burms. (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 30.11.1952.
2. TREATMENTS:
1. 4"x4" spacing with 1 seedling/hole.
2. 6"x6" spacing with 2 seedlings/hole.
3. 9"x9" spacing with 4 seedlings/hole.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) 9'x12'. (b) 9'x12'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 3013 lb/ac.
(ii) 312.8 lb/ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb/ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3440</td>
</tr>
<tr>
<td>2.</td>
<td>2520</td>
</tr>
<tr>
<td>3.</td>
<td>3080</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>139.9 lb/ac.</td>
</tr>
</tbody>
</table>

Crop: Paddy.  
Site: Labhandi Farm, Raipur.  
Ref: M.P. 53(47).  
Type: ‘C’.

Object: To find out the effect of plant to plant spacing on the yield of Paddy.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) Nil. (ii) (a) *Musa.* (b) N.A. (iii) 28.8.1953. (iv) (a) Ploughing. (b) Transplanted. (c)—. (d) and (e) As per treatments. (v) F.Y.M. at 8 C.L./ac. (vi) *Lusalk* x *permatia* No. 18 (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 29.11.1953.

2. TREATMENTS:
1. 4"x4" spacing with 1 seedling/hole.
2. 6"x6" spacing with 2 seedlings/hole.
3. 9"x9" spacing with 4 seedlings/hole.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 9’x12’. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good and no lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 2933 lb/ac.
(ii) 750.0 lb/ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb/ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2720</td>
</tr>
<tr>
<td>2.</td>
<td>2960</td>
</tr>
<tr>
<td>3.</td>
<td>3120</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>335.4 lb/ac.</td>
</tr>
</tbody>
</table>
Object:—To compare the yield of Paddy sown by different cultural methods.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Dorsa soil. (b) N.A. (iii) 26.6.1951/13.8.1951. (iv) (a) Ploughing and cross ploughing. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) Gurmatia (medium). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. Seed drilled 9" apart.
   2. Seed sown by biasi method.
   3. Seedlings transplanted 4" to 6" apart.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 1/100 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1955. (b) No. (c) N.A. (d) and (b) N.A. (e) Nil. (vi) and (vii) Nil.

5. RESULTS:
   (i) 903 lb./ac.
   (ii) 188.8 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield |
   ---------- |---------- |
   1.         | 1020      |
   2.         | 950       |
   3.         | 740       |
   S.E./mean  = 84.1 lb./ac.

Object:—To compare the yield of Paddy sown by different cultural methods.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Dorsa soil. (b) N.A. (iii) As per treatments. (iv) (a) Ploughing. (b) As per treatments. (c) N.A. (d) As per treatments. (e) N.A. (v) N.A. (vi) Gurmatia (late). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 15.11.1952.

2. TREATMENTS:
   1. Seed drilled 9" apart on 10.7.1952.
   2. Seed broadcasted by biasi method on 10.7.1952.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 5. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good growth. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1955. (b) No. (c) N.A. (d) (a) and (b) N.A. (e) Nil. (vii) Yield is poor.

5. RESULTS:
   (i) 956 lb./ac.
   (ii) 159.4 lb./ac.
   (iii) Treatments are not significantly different.
Crop: Paddy.  
Site: Labhandi Farm, Raipur.

Object: To compare the yield of Paddy sown by different cultural methods.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Dorsa* soil. (b) N.A. (iii) 17.7.1950. (iv) (a) Ploughing by *meston* plough and harrowing. (b) and (c) As per treatments. (d) 9' for drilling method. (e) —. (v) N.A. (vi) Cross 116 (medium). (vii) Irrigated. (viii) Weeding. (ix) 38°. (x) 22.11.1950.

2. TREATMENTS:
   1. Biasi method—seed rate at 100 lb./ac.
   2. Drilling—seed rate at 80 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.

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

5. RESULTS:
   (i) 1529 lb./ac.
   (ii) 57.68 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1468</td>
</tr>
<tr>
<td>2.</td>
<td>1590</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>28.84 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Paddy.  
Site: Labhandi Farm, Raipur.

Object: To compare the yield of Paddy sown by different cultural methods.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Matasi* soil. (b) N.A. (iii) 19.7.1950. (iv) (a) 2 ploughings by *meston* plough followed by harrowing with peg tooth harrow. (b) and (c) As per treatments. (d) 9' for drilling. (e) —. (v) N.A. (vi) Cross 116 (medium). (vii) Irrigated. (viii) Weeding. (ix) 38°. (x) 23.11.1950.

2. TREATMENTS:
   1. Biasi method with seed rate at 100 lb./ac.
   2. Drilling with seed rate at 80 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.
4. GENERAL:
   (i) Good. No lodging. (ii) Nil. (iii) Grain yield. (iv) (a) Nil. (b) —. (c) N.A. (v) (a) N.A. (vi) N.A. (vii) and (viii) Nil.

5. RESULTS:
   (i) 1344 lb./ac.
   (ii) 354.7 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield |
   ------------- | --------- |
   1. | 1420 |
   2. | 1268 |
   S.E./mean = 177.4 lb./ac.

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**Crop:** Paddy. **Ref:** M.P. 53(45)

**Site:** Labhandi Farm, Raipur.

**Object:** To compare the yield of Paddy sown by different cultural methods.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) *Mutasi.* (b) —. (iii) As per treatments. (iv) (a) Ploughing. (b) to (d) As per treatments. (v) N.A. (vi) *Garumia.* (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) November 1953.

2. **TREATMENTS:**
   1. Paddy sown by broadcast at 100 lb./ac. on 10.8.1953.
   2. Paddy drilled 9" apart at 70 lb./ac. on 9.7.1953.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) J. (b) N.A. (iii) S. (iv) (a) and (b) 1/10 ac. (v) Nil. (vi) Yes.

4. **GENERAL:**
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952—1955. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 1069 lb./ac.
   (ii) 247.7 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield |
   ------------- | --------- |
   1. | 1034 |
   2. | 1028 |
   3. | 1146 |
   S.E./mean = 110.8 lb./ac.

---

**Crop:** Paddy. **Ref:** M.P. 53(90).

**Site:** Govt. Experimental Farm, Labhandi (Raipur). **Type:** ‘C’.

**Object:** To study the economics of growing Paddy followed by *wetra* as compared to Paddy alone follow ed by *Kuthwa*.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) N.A. (iii) N.A. (iv) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.
2. TREATMENTS:
1. Paddy followed by utera.
2. Paddy followed by kuthwa.

3. DESIGN:
(i) R.B.D.  (ii) [a] 2.  (b) N.A.  (iii) 5.  (iv) [a] N.A.  (b) 1/40 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) [a] to (c) N.A.  (v) [a] and (b) N.A.  (vi) N.A.  (vii) N.A.

5. RESULTS:
(i) 2228 lb./ac.
(ii) 131.7 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2152</td>
</tr>
<tr>
<td>2.</td>
<td>2304</td>
</tr>
</tbody>
</table>

S.E./mean = 58.9 lb./ac.

Crop : Paddy.  
Ref :> M.P. 53(89).

Site :- Govt. Experimental Farm, Labhandi (Raipur). Type :- 'C'.

Object :- To study the economics of growing late Paddy alone as against medium Paddy followed by Utera.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) and (c) N.A.  (ii) (a) and (b) N.A.  (iii) N.A.  (iv) [a] to (c) N.A.  (v) N.A.  (vi) N.A.  (vii) N.A.  (viii) N.A.  (ix) N.A.  (x) N.A.

2. TREATMENTS:
1. Late paddy alone.
2. Medium paddy followed by Lakh.
3. Medium paddy followed by Urid.
4. Medium paddy followed by Linseed.

3. DESIGN:
(i) L sq.  (ii) [a] 4.  (b) N.A.  (iii) 4.  (iv) [a] N.A.  (b) 1/40 ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) [a] to (c) N.A.  (v) [a] and (b) N.A.  (vi) N.A.  (vii) Yield data of lakh, urid and linseed are not available.

5. RESULTS:
(i) 2125 lb./ac.
(ii) 3116 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
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<td>1.</td>
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<tr>
<td>2.</td>
<td>2030</td>
</tr>
<tr>
<td>3.</td>
<td>2060</td>
</tr>
<tr>
<td>4.</td>
<td>2040</td>
</tr>
</tbody>
</table>

S.E./mean = 155.8 lb./ac.
Crop: Paddy.
Site: Harsi Experimental Farm, Bagwai.

Object: To find out suitable seed rate for broadcast Paddy.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) F.Y.M. at 15 C.L./ac. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai.
   (iii) 31.7.1950. (iv) (a) Twice ploughing by desi plough, patrera and bakhariing. (b) Seed broadcast. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) One weeding. (ix) 22.48°. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 seed rates: R1 = 20, R2 = 30, R3 = 40 and R4 = 50 srs./ac.
   (2) 2 varieties: V1 = basmati and V2 = Bhadaya.

3. DESIGN:
   (i) 4x2 Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 12'x66'. (b) 9'x60'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Ordinary. (ii) Nil. (iii) Germination, health and yield of grain and straw. (iv) (a) 1950 to 1951. (b) No. (c) N.A. (x) (a) and (b) N.A. (v) and (vii) Nil.

5. RESULTS:
   (i) 1030 lb./ac.
   (ii) 193.5 lb./ac.
   (iii) Main effect of R alone is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>850</td>
<td>909</td>
<td>1206</td>
<td>1290</td>
<td>1014</td>
</tr>
<tr>
<td>V2</td>
<td>884</td>
<td>1070</td>
<td>1100</td>
<td>1075</td>
<td>1017</td>
</tr>
</tbody>
</table>

Mean 867 989 1153 1112 1010

S.E. of marginal mean of R = 55.9 lb./ac.
S.E. of marginal mean of V = 39.5 lb./ac.
S.E. of body of table = 78.9 lb./ac.
5. RESULTS:

(i) 1047 lb./ac.
(ii) 299.5 lb./ac.
(iii) Main effects of R and V are highly significant. Interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>V1</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
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<tbody>
<tr>
<td>860</td>
<td>1203</td>
<td>1260</td>
<td>1539</td>
<td>1215</td>
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<tr>
<td>774</td>
<td>887</td>
<td>855</td>
<td>995</td>
<td>873</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>817</td>
<td>1045</td>
<td>1058</td>
<td>1267</td>
<td>1047</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of R = 86.5 lb./ac.
S.E. of marginal mean of V = 61.1 lb./ac.
S.E. of body of table = 122.2 lb./ac.

Crop: Paddy (*Kharif*).

Ref: M.P. 52(67).

Site: Govt. Seed and Demonstration Farm, Durg.

Type: *CM*.

Object: To study the effect of N and P<sub>2</sub>O<sub>5</sub> on different methods of Paddy cultivation.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A.  
(ii) (a) *Materi*.  
(b) N.A.  
(iii) As per treatments.  
(iv) (a) 3 ploughings.  
(b) As per treatments.  
(c) to (e) N.A.  
(v) N.A.  
(vi) Irrigated.  
(vii) Weedings were done twice in *biasi* and broadcast plots.  
(ix) 45.88'.  
(x) 19, 20.11.1952.

2. TREATMENTS:

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

(1) 3 methods of sowing: M<sub>1</sub>=Transplanted, M<sub>2</sub>=*Biasi* on 27.6.1952, and M<sub>3</sub>=Broadcast on 28.6.1952.

(2) 3 levels of N as A/S:

N<sub>0</sub>=0, N<sub>1</sub>=15, N<sub>2</sub>=30 lb./ac.

(3) 3 levels of P<sub>2</sub>O<sub>5</sub> as Super:

P<sub>0</sub>=0, P<sub>1</sub>=15 and P<sub>2</sub>=30 lb./ac.

3. DESIGN:

(i) 3<sup>rd</sup> confd.  
(ii) 9.  
(b) N.A.  
(iii) 4.  
(iv) (a) and (b) 33'x16'.  
(v) Nil.  
(vi) Yes.

4. GENERAL:

(i) Good growth.  
(ii) Negligible attack of bugs.  
(iii) Weight of grain.  
(iv) (a) 1952 to 1954.  
(b) N.A.  
(c) Nil.  
(v) (a) Raipur.  
(b) N.A.  
(vii) Nil.  
(yii) Confounding is not done properly, therefore the experiment is analysed as R.B.D.

5. RESULTS:

(i) 2251 lb./ac.

(ii) 321.5 lb./ac.

(iii) Main effects of N and P and interaction MNP are significant. Interactions MN<sub>0</sub>, MP and NP are highly significant.

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

<table>
<thead>
<tr>
<th>N&lt;sub&gt;0&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;</th>
<th>Mean</th>
<th>P&lt;sub&gt;0&lt;/sub&gt;</th>
<th>P&lt;sub&gt;1&lt;/sub&gt;</th>
<th>P&lt;sub&gt;2&lt;/sub&gt;</th>
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<td>2151</td>
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<td>2398</td>
<td>2354</td>
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<td>2220</td>
<td>2251</td>
<td>2144</td>
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</tr>
</tbody>
</table>

S.E. of any marginal mean = 53.6 lb./ac.
S.E. of body of any table = 92.8 lb./ac.
Crop :- Paddy (Kharif).
Site :-  Govt. Seed and Demonstration. Farm, Durg. Type :- 'CM'.

Object:— To find the effect of N and P₂O₅ applied with different methods of sowing Paddy.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) N.A.  iv) (a) N.A. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1). (2) and (3).
   1) 3 methods of sowing:— M₁ = Transplanting, M₂ = Biasi and M₃ = Broadcasting.
   2) 3 levels of N as A/S:— N₀=0, N₁ =15 and N₂ =30 lb./ac.
   3) 3 levels of P₂O₅ as Super:— P₀ =0, P₁ =15 and P₂ =30 lb./ac.

3. DESIGN:
   (i) 3⁶ confd. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) and (b) 1/80 ac.  (v) Nil. (vi) N.A.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Weight of grain. (iv) (a) 1952—N.A. (b) N.A. (c) Nil. (v) (a) Raipur. (b) N.A. (vi) Nil. (vii) Experiment is analysed as R.B.D. Fact. as the layout of the exp. is not available.

5. RESULTS:
   (i) 2244 lb./ac.
   (ii) 292.7 lb/ac.
   (iii) Main effect of M is not significant. Other effects and interactions are highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
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</tr>
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</table>

S.E. of any marginal mean =48.8 lb./ac.
S.E. of body of table =84.5 lb./ac.

Crop :- Paddy.
Site :- Adhartal Farm, Jabalpur.

Object:— To find out the effect of different doses of manures applied with different methods of sowing.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy.  (c) N.A. (ii) (a) Sehra.  (b) Re'fer' soil analysis, Jabalpur. (i) (ii) 27.7.1953/4.8.1953. (iv) (a) ploughing and levelling. (b) Transplanted. (c) —. (d) and (e) As per treatments. (iv) F.Y.M. at 10 C.L./ac. applied on 25.6.1953. (v) Lucha', Gar maria, Burma No. 2 (late). (vii) Irrigated. (viii) 2 weedings. (ix) 24.71°. (x) 14.12.1953 to 19.12.1953.
2. TREATMENTS:

Main-plot treatments:

All combinations of (1) and (2)

(1) 2 doses of manures: $M_1 = A/S$ at 40 lb./ac. of N + Super at 40 lb./ac. of $P_2O_5$ and $M_2 = A/S$ at 60 lb./ac. of N + Super at 60 lb./ac. of $P_2O_5$.

(2) 2 times of application of manures: $T_1 =$ full at transplanting and $T_2 =$ half at transplanting and half one month after.

Sub-plot treatments:

5 spacings and number of seedlings/hole: $S_1 = 4' \times 4'$ with 1 seedling/hole, $S_2 = 6' \times 9'$ with 2 seedlings/hole, $S_3 = 9' \times 9'$ with 4 seedlings/hole and $S_4 = 9' \times 9'$ with 4 seedlings/hole.

3. DESIGN:

(i) Split-plot. (ii) (a) 4 main-plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 60'x13'. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953 to 1955. (b) Yes. (c) N.A. (v) (a) Betul and Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 3559 lb./ac.

(ii) (a) 876.8 lb./ac.

(b) 704.8 lb./ac.

(iii) None of the effects is significant.

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

<table>
<thead>
<tr>
<th>Treatment</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
<th>$S_5$</th>
<th>Mean</th>
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<th>$T_2$</th>
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<td>3416</td>
<td>3404</td>
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<tr>
<td>$M_2$</td>
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<td>3521</td>
<td>4092</td>
<td>3223</td>
<td>3672</td>
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<td>$S_2$</td>
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<td>3457</td>
<td>3401</td>
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</table>

S E. of difference of two

1. M or T marginal means

2. S marginal means

3. S means at the same level of M or T

4. M or T means at the same level of S

= 160.1 lb./ac.

= 203.5 lb./ac.

= 287.7 lb./ac.

= 303.1 lb./ac.

Crop: Paddy (Kharij).

Site: Adhartal Farm, Jabalpore.

Ref: M.P. 52(33).

Type: 'CM'.

Object: To find the economic ratio of N to $P_2O_5$ for different methods of Paddy cultivation.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Soil analysis, Jabalpore. (iii) $M_1$ and $M_2$ on 1, 2.8.1952 and $M_3$ on 17.7.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:

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

(1) 3 methods of cultivation: $M_1 =$ Transplanting, $M_2 =$ machowa, and $M_3 =$ Broadcasting.

(2) 3 levels of N as A/S: $N_0 = 0$, $N_1 = 15$ and $N_2 = 30$ lb./ac.

(3) 3 levels of $P_2O_5$ as Super: $P_0 = 0$, $P_1 = 15$ and $P_2 = 30$ lb./ac.
3. DESIGN:
(i) 3\(^3\) partially confounded.
(ii) (a) 9 (b) N.A.
(iii) 4 (only two replications are taken for analysis).
(iv) (a) N.A. (b) 33'x16'.
(v) N.A.
(vi) Yes.

4. GENERAL:
(i) Immediately after transplanting operation heavy showers were received which resulted in washing out of some of the transplanted plots of replication III and IV. So re-transplanting was done on 8.8.1952. (ii) Attack of rice bugs noticed in all plots. All the plots were dusted with gammexane mixture uniformly at 20 lb./ac. (iii) Grain and straw yield. (iv) (a) 1952—N.A. (b) and (c) N.A. (v) (a) Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1156 lb./ac.
(ii) 158.2 lb./ac.
(iii) Main effects of M, N and P are highly significant. Component of MNP is significant.
(iv) Av. yield of grain in lb./ac.


<table>
<thead>
<tr>
<th>N(_3)</th>
<th>N(_1)</th>
<th>N(_2)</th>
<th>Mean</th>
<th>M(_1)</th>
<th>M(_2)</th>
<th>M(_3)</th>
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<td>1244</td>
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<td>1260</td>
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<td>1200</td>
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Mean:

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<th>M(_2)</th>
<th>M(_3)</th>
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<tbody>
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<td>1187</td>
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<td>1177</td>
</tr>
<tr>
<td>821</td>
<td>1018</td>
<td>1259</td>
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</tbody>
</table>

S.E. of any marginal mean = 37.3 lb./ac.
S.E. of body of table = 64.6 lb./ac.

Site: Adarthal Farm, Jabalpore. Type: 'CM'.

Object: To find the suitable ratio of N to P\(_2\)O\(_5\) with different methods of Paddy cultivation.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Schra. (b) Refer soil analysis, Jabalpore. (iii) 9.7.1953 for M\(_3\), 19.7.1953 for M\(_2\) and 6.8.1953 for M\(_1\). (iv) (a) Ploughing. (b) As per treatments. (c) to (e) N.A. (v) N.A. (vi) Paddy No. 17 (early). (vii) Irrigate. (viii) N.A. (ix) 24.2.1953; (x) 27; (xi) 23.10.1953.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 methods of cultivation: M\(_1\) = Transplanting, M\(_2\) = Chakowa and M\(_3\) = Broadcasting,
(2) 3 levels of N as A/S: N\(_0\) = 0, N\(_1\) = 15, and N\(_2\) = 30 lb./ac.
(3) 3 levels of P\(_2\)O\(_5\) as Super: P\(_0\) = 0, P\(_1\) = 15 and P\(_2\) = 30 lb./ac.

3. DESIGN:
(i) 3\(^3\) Fact. in R.B.D. (ii) (a) 27. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952—N.A. (b) Yes. (c) N.A. (v) (a) Raipur. (b) N.A. (vi) Nil. (vii) The yield of plot with treatment N\(_3\)P\(_1\)M\(_3\) is zero. But no reason is given for zero yield. The analysis is performed taking the yield as zero.

5. RESULTS:
(i) 934 lb./ac.
(ii) 265.6 lb./ac.
(iii) Main effects of M, N and interaction MNP are highly significant.
Crop :- Paddy.  
Site :- Labhandi Farm, Raipur.  
Ref :- M.P. 53(53).  
Type :- 'CM'.

Object :- To study the effect of manures and cultural operations on Paddy crop.

1. BASAL CONDITIONS :   
   (i) (a) Nil. (b) Paddy. (c) As per treatments. (ii) (a) Dura, (b) N.A. (iii) 10 to 17.7.1953. (iv) (a) Ploughing. (b) Transplanted. (c) —. (d) and (e) As per treatments. (v) Nil. (vi) Luchai, Garmaiya, Burma No. 2. (vii) Irrigated. (viii) I weeding and 2 interculturings. (ix) N.A. (x) 29.11.1953.

2. TREATMENTS ;  
Main-plot treatments :  
All combinations of (1) and (2)  
(1) 2 manures : M₁ = A/S at 40 lb./ac. of N+Super at 40 lb./ac. of P₂O₅ and M₂ = A/S at 60 lb./ac. of N+Super at 60 lb./ac. of P₂O₅.  
(2) 2 times of applications : T₁ = Full at transplanting and T₂ = Half at transplanting and half one month after.  
Sub-plot treatments :  
5 spacings and seedlings/hole : S₁ = 4" x 4" with one seedling/hole, S₂ = 9" x 6" with 2 seedlings/hole, S₃ = 9" x 6" with 4 seedlings/hole, S₄ = 9" x 9" with 2 seedlings/hole and S₅ = 9" x 9" with 4 seedlings/hole.

3. DESIGN :  
(i) Split-plot. (ii) (a) 4 main-plots/block ; 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL :  
(i) Good. No lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1953—1955. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :  
(i) 4440 lb./ac.  
(ii) (a) 788.1 lb./ac.  
(b) 619.7 lb./ac.  
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
<th>S₅</th>
<th>Mean</th>
<th>M₁</th>
<th>M₂</th>
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<td>4580</td>
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<td>T₂</td>
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<td>4110</td>
<td>4400</td>
<td>4560</td>
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</table>

S.E. of difference of two
1. M or T marginal means = 176.2 lb./ac.
2. S marginal means = 219.1 lb./ac.
3. S means at the same level of M or T = 309.8 lb./ac.
4. M or T means at the same level of S = 328.4 lb./ac.

Crop :- Wheat. (Rabi).
Site :- Harsi Exptl. Farm, Bagwai.
Ref :- M.P.51(41).
Type :- 'M'.

Object :- To find the response of C/N to Wheat crop in comparison to A/S.

1. BASAL CONDITIONS :
   (i) (a) to (c) Nil. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 16.12.1951. (iv) (a) Ploughing by tractor. Bakharing. (b) Drilling. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Pb. C-591 (late).
   (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 2 doses of lime :- L₀ = 0 and L₁ = 200 lb./ac.
   (2) 5 doses of N :- N₀ = 0, N₁ = 20 lb./ac. of N as A/S, N₂ = 40 lb./ac. of N as A/S, N₃ = 20 lb./ac. of N as C/N, and N₄ = 40 lb./ac. of N as C/N.

3. DESIGN :
   (i) 2 x 5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 2. (iv) (a) 18' x 9'. (b) 12' x 90'. (v) 3' apart. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 — N.A. (b) N.A. (c) N.A.
   (v) (a) and (b) N.A. (vi) Nil. (vii) The experiment was laid out in three replications. The crop in replication III was completely damaged by cattle.

5. RESULTS:
   (i) 840 lb./ac.
   (ii) 116 lb./ac.
   (iii) Interaction N x L alone is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
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<td>907</td>
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<td>900</td>
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<td>778</td>
<td>808</td>
<td>805</td>
<td>840</td>
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</table>

S.E. of marginal mean of N = 58.00 lb./ac.
S.E. of marginal mean of L = 36.68 lb./ac.
S.E. of body of table = 82.05 lb./ac.
Crop :- Wheat.  (Rabi)  
Site :- Harsi. Expt. Farm, Bagwai. 
Object :- To find out optimum combination of N and P₂O₅ for irrigated Wheat. 

1. BASAL CONDITIONS :  
(i) (a) Nil. (b) Sugarcane. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 1, 2, 3, 12, 1952. (iv) (a) Ploughing. (b) to (c) N.A. (v) [N.A. (vi) Pb. C-591 (late) (vii) Irrigated. (viii) Nil. (ix) 2.91". (x) N.A.  

2. TREATMENTS :  
All combinations of (1) and (2)  
(1) 5 doses of N : N₀=0, N₁=10, N₂=20, N₃=30 and N₄=40 lb./ac.  
(2) 2 doses of P₂O₅ : P₀=No, P₁=P₂O₅ applied.  

3. DESIGN :  
(i) 5 x 2 Pect. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 9' x 10'. (v) Nil. (vi) Yes.  

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

5. RESULTS :  
(i) 311.3 lb./ac.  
(ii) 54.18 lb./ac.  
(iii) N, P and their interaction N x P are all significant.  
(iv) Av. yield of grain in lb./ac. 

<table>
<thead>
<tr>
<th>P₀</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>Mean</th>
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<td>244.7</td>
<td>296.7</td>
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<td>284.3</td>
<td>391.3</td>
<td>275.7</td>
<td>390.2</td>
<td>335.62</td>
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</table>

Mean 313.6 264.5 344.01 288.5 345.7 311.3  

S.E. of marginal mean of N = 15.69 lb./ac.  
S.E. of marginal mean of P = 9.90 lb./ac.  
S.E. of body of table = 22.12 lb./ac.  

Crop :- Wheat (Rabi).  
Site :- Harsi Exptl. Farm, Bagwai.  
Object :- To find out a suitable manural dose for Wheat under irrigation with a view to obtain maximum yield.  

1. BASAL CONDITIONS :  
(i) (a) No. (b) Paddy and Rabi vegetables. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 7 to 29.11.1951. (iv) (a) In one field, where paddy was grown in previous season bukharing twice, ploughing by chotanaga, planking once; ploughing by desi plough. In the field where vegetable was grown, the field was ploughed by chotanaga, planking twice and ploughing by desi plough. (b) to (e) N.A. (v) Sannhamp as G.M. crop sown in previous season and buried in the soil before sowing of wheat. (vi) C. 591 (late). (vii) Irrigated. (viii) Nil. (ix) 3.91". (x) N.A.  

2. TREATMENTS :  
1. No manure 7. Treat. 2+40 lb./ac. of P₂O₅  
2. 20 lb./ac. of N 8. Treat. 2+60 lb./ac. of P₂O₅.  
3. 40 lb./ac. of N 9. Treat. 3+40 lb./ac. of P₂O₅.  
4. 60 lb./ac. of N. 10. Treat. 3+60 lb./ac. of P₂O₅.  
5. 80 lb./ac. of N. 11. Treat. 3+80 lb./ac. of P₂O₅.  
6. Treat. 2+20 lb./ac. of P₂O₅.  
Source of N for treats. 2 to 8 is A/S while for 9 to 11 A/S and G.N.C. is 1 : 1 ratio. Source of P₂O₅ is Super.
3. DESIGN:
(i) R.B.D.  (ii) (a) 11.  (b) N.A.  (iii) 6.  (iv) (a) 18' x 96'.  (b) 12' x 90'.  (v) 3' around.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) Nil.  (iii) Grain and straw yield.  (iv) (a) 1950 to 1951.  (b) No.  (c) N.A.  (v) (a) N.A.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1264 lb./ac.
(ii) 180.1 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
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<td>8.</td>
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<td>6.</td>
<td>1191</td>
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</table>

S.E./mean = 73.5 lb./ac.

Site :- Govt. Seed and Demonstration Farm, Betul.  Type :- 'M'.

Object :- To find out the comparative value of decorticated and undecorticated cot on seed cake in their effect on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Morand H.  (b) Refer soil analysis, Betul.  (iii) 4.11.1951.  (iv) (a) 2 bakharings given in October 1951.  (b) Sown by nari plough.  (c) to (e) N.A.  (v) 20 C.I./a.: c.f. 3.Y.M.  (vi) Hy. 65 (early).  (vii) Irrigated.  (viii) Nil.  (ix) N.A.  (x) 21 to 23.3.1952.

2. TREATMENTS:
1. Control.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as A/S.
4. 20 lb./ac. of N as cotton seed cake decorticated.
5. 20 lb./ac. of N as cotton seed cake undecorticated.

3. DESIGN:
(i) 5 x 5 L. Sq.  (ii) (a) 5.  (b) N.A.  (iii) 5.  (iv) (a) and (b) 33' x 33'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1951 to 1952.  (b) and (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 852.8 lb./ac.
(ii) 70.12 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>784</td>
<td>7.</td>
<td>1266</td>
</tr>
<tr>
<td>2.</td>
<td>936</td>
<td>8.</td>
<td>1312</td>
</tr>
<tr>
<td>3.</td>
<td>864</td>
<td>9.</td>
<td>1504</td>
</tr>
<tr>
<td>4.</td>
<td>912</td>
<td>10.</td>
<td>1460</td>
</tr>
<tr>
<td>5.</td>
<td>768</td>
<td>11.</td>
<td>1668</td>
</tr>
</tbody>
</table>

S.E./mean = 31.88 lb./ac.
Crop : Wheat.  
Site : Govt. Seed and Demonstration Farm, Betul.  
Type : 'M'.
4. GENERAL:
(i) Satisfactory. (ii) N.A. (iii) Grain yield. (iv) (a) No. (b) and (c) N.A. (v) (a) Betul, Powaikheda, and Adhartal. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 283 lb./ac.
(ii) 48.3 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>212</td>
</tr>
<tr>
<td>2.</td>
<td>288</td>
</tr>
<tr>
<td>3.</td>
<td>302</td>
</tr>
<tr>
<td>4.</td>
<td>262</td>
</tr>
<tr>
<td>5.</td>
<td>336</td>
</tr>
<tr>
<td>6.</td>
<td>302</td>
</tr>
<tr>
<td>7.</td>
<td>280</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>≈ 21.6 lb./ac.</td>
</tr>
</tbody>
</table>

Site: Govt. Seed and Demonstration Farm, Betul. Type: 'M'.

Object: To compare the effect of C/N and A/S on irrigated Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Moraul H. (b) Refer soil analysis, Betul. (iii) 6.11.1953. (iv) (a) 4 Bakharwals as per local practice. (b) to (e) N.A. (v) NA. (vi) Hy 65 (early). (vii) Irrigated. (viii) N.A. (ix) 32.63* (x) 25.3.1954.

2. TREATMENTS:
All combinations of (1) and (2)
(i) 3 levels of N: N₀ = 0, N₁ = 15 and N₂ = 30 lb./ac.
(ii) 2 sources of N: S₁ = A/S and S₂ = C/N.

3. DESIGN:
(i) 3 x 2 Factorial in R. B. D. (ii) 6. (b) N.A. (iii) 5. (iv) a) N.A. (b) 1/89 ac. (v) N.A. (vi) Yas.

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

5. RESULTS:
(i) 915 lb./ac.
(ii) 158.5 lb./ac.
(iii) S and "control vs others" effects are highly significant while other effects are not significant.
(iv) Av. yield of grain in lb./ac.

Control = 856 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>1280</td>
<td>1144</td>
<td>1212</td>
</tr>
<tr>
<td>S₂</td>
<td>640</td>
<td>712</td>
<td>676</td>
</tr>
<tr>
<td>Mean</td>
<td>960</td>
<td>928</td>
<td>944</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean or control mean ≈ 50.15 lb./ac.
S.E. of body of table ≈ 70.93 lb./ac.
Crop :- Wheat. 
Site :- Govt. Seed and Demonstrations. Farm, Betul. 
Type :- 'M'.

Object :-To determine the optimum dose of N and P for Wheat.

1. BASAL CONDITIONS :
   (i) (a) NA. (b) Wheat. (c) 40. C.L./ac. of F. Y. M.  (ii) (a) Morand II (b) Refer soil analysis, Betul.
   (iii) 6.11.1963. (iv) (a) 4 bakharchings as per local practice. (b) Drilled. (c) to (e) N.A. (v) F. Y. M. at 40

2. TREATMENTS :
   All combinations of (1) and (2) except N₂ P₄ which is replaced by fertilizer mixture. (f.m.)
   (1) 3 levels of N : N₀ =0, N₁=15 and N₂=30 lb/ac.
   (2) 5 levels of P₂O₅ : P₀=0, P₁=15, P₂=30, P₃=45 and P₄=60 lb/ac.
   Fertilizer mixture=20 lb/ac. of G.N.C.+2 md/ac. of A/S+20. lb/ac. of P₂O₅.

3. DESIGN :
   (i) R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 1/80 ac. (v) N.A.

4. GENERAL :
   (i) N.A. (ii) N.A. (iii) grain yield. (iv) (a) 1953 to 1955. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and
   (vii) Nil.

5. RESULTS :
   (i) 682.7 lbs/ac.
   (ii) 172.8 lbs/ac.
   (iii) The treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment Av. yield Treatment Av. yield
   N₀ P₀ 520.1 N₁ P₁ 706.7
   N₀ P₁ 613.4 N₁ P₂ 713.4
   N₀ P₂ 680.1 N₁ P₃ 660.1
   N₀ P₃ 706.7 N₁ P₄ 746.8
   N₀ P₄ 620.1 N₂ P₀ 720.1
   N₁ P₀ 733.4 N₂ P₁ 713.4
   N₁ P₁ 666.7 (f.m.)
   N₁ P₂ 766.8
   S.E./me.n. = 100.0 lb./ac

Crop :- Wheat. 
Site :- Govt. Agri. Res. Farm, Bhilasa. 
Type :- 'M'.

Object :-To find the effect of different doses of N and P₂O₅ singly and in combination.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Heavy clay. (b) N.A. (iii) 4.11.1950. (iv) (a) 4 bakharchings. (b)
   Seeds drilled. (c) 25 seeds/ac. (d) Rows 12' apart. (e) N.A. (f) No. (vi) Jalalia (local). (vii) Unirrigated. (viii)
   Nil. (ix) N.A. (x) N.A.

2. TREATMENTS :
   1. Control (no manure).
   2. 10 lb./ac. of N+10 lb./ac. of P₂O₅.
   3. 10 lb./ac. of N.
   4. 10 lb./ac. of N+20 lb./ac. of P₂O₅.
   5. 20 lb./ac. of N.
   6. 20 lb./ac. of N+20 lb./ac. of P₂O₅.
   7. 30 lb./ac. of N.
   8. 30 lb./ac. of N+30 lb./ac. of P₂O₅.
   9. 40 lb./ac. of N.
   10. 40 lb./ac. of N+40 lb./ac. of P₂O₅.

   Source of N for treatments 2 to 8 is A/S while treatments 9 to 11 is mixture of A/S and G.N.C. in 1:1 ratio. 
   Source of P₂O₅ is Super. Manures drilled in 3 replications and mixed with the seed while in the other
   3, manures drilled between rows just before or immediately after sowing.

3. DESIGN :
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 16'×96'. (b) 12'×90'. (v) 3' around. (vi) Yes.
4. GENERAL:
(i) Due to poor winter showers the yield was not good. (ii) N.A. (iii) Grain yield. (iv) 1952 to 1951.
(b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) In three blocks the manures drilled between rows just before or immediately after sowing 3' deep. In the remaining 3 blocks the manures were drilled mixed with the seed.

5. RESULTS:
(i) 365.43 lb./ac.
(ii) 79.65 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>234.0</td>
<td>7.</td>
<td>313.7</td>
</tr>
<tr>
<td>2.</td>
<td>370.4</td>
<td>8.</td>
<td>338.1</td>
</tr>
<tr>
<td>3.</td>
<td>421.4</td>
<td>9.</td>
<td>353.6</td>
</tr>
<tr>
<td>4.</td>
<td>380.1</td>
<td>10.</td>
<td>340.5</td>
</tr>
<tr>
<td>5.</td>
<td>409.4</td>
<td>11.</td>
<td>366.2</td>
</tr>
<tr>
<td>6.</td>
<td>432.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 32.67 lb./ac.

Crop: - Wheat.
Ref: - M.P. 51(8).
Type: - 'M'.

Object: - To find out suitable combination of N and P.O.3 for Wheat under dry conditions.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Heavy clay. (b) N.A. (iii) 14.10.1951. (iv) (a) 6 bags/bal. (b) Seeds drilled. (c) 25 seeds/ac. (d) Rows 1' apart.

2. TREATMENTS:
1. Control (no manure).
2. 10 lb./ac. of N.
3. 20 lb./ac. of N.
4. 30 lb./ac. of N.
5. 40 lb./ac. of N.
6. 10 lb./ac. of N+10 lb./ac. of P.O.3.
Source of N for treatments 2 to 8 is A/S, while for treatments 9 to 11 is mixture of A/S and G.N.C. in 1 : 1 ratio; P.O.3 applied as Super. Manures applied in 3 replications just after sowing and in 3 replications drilled with seed.

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 3 for each time of application. (iv) (a) 14'×9'. (b) 12'×9'. (v) 2'×3'. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950 to 1951. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) The method of application of manures is different for different blocks. The experiment is treated as two separate experiments depending on the method of application of manures.

5. RESULTS:
Manures drilled with seed.
(i) 130.2 lb./ac.
(ii) 34.28 lb./ac.
(iii) The treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>126.5</td>
<td>7.</td>
<td>160.5</td>
</tr>
<tr>
<td>2.</td>
<td>231.3</td>
<td>8.</td>
<td>126.7</td>
</tr>
<tr>
<td>3.</td>
<td>146.1</td>
<td>9.</td>
<td>80.6</td>
</tr>
<tr>
<td>4.</td>
<td>143.5</td>
<td>10.</td>
<td>102.4</td>
</tr>
<tr>
<td>5.</td>
<td>114.2</td>
<td>11.</td>
<td>57.9</td>
</tr>
<tr>
<td>6.</td>
<td>157.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 19.79 lb./ac.

Manures applied just after sowing.
(i) 174.93 lb./ac.
(ii) 50.01 lb./ac.
(iii) Treatments are highly significantly different.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>275.7</td>
<td>2.</td>
<td>138.6</td>
</tr>
<tr>
<td>2.</td>
<td>172.2</td>
<td>3.</td>
<td>157.9</td>
</tr>
<tr>
<td>4.</td>
<td>116.7</td>
<td>5.</td>
<td>215.0</td>
</tr>
<tr>
<td>6.</td>
<td>147.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 28.87 lb./ac.
Crop :- Wheat.  
Site :- Central Agri. Res. Farm, Nabi bagh, Bhopal.  
Type :- 'M'.

Object :—To study the effect of A/S and Super on Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  
(ii) (a) Black cotton soil.  
(b) N.A.  
(iii) 28.10.1948.  
(iv) (a) N.A.  
(b) Seeds drilled behind the plough.  
(c) 40 srs./ac.  
(d) and (e) N.A.  
(v) N.A.  
(vi) C-591.  
(vii) Unirrigated.  
(viii) Nil.  
(ix) N.A.  
(x) 19.3.1949.

2. TREATMENTS :
1. Control (no manure).
2. A/S at 1 md./ac. drilled with seed.
3. Super at 1 md./ac. drilled with seed.

3. DESIGN :
(i) R.B.D.  
(ii) (a) 3.  
(b) N.A.  
(iii) 4.  
(iv) (a) and (b) 1/80 ac.  
(v) Nil.  
(vi) Yes.

4. GENERAL :
(i) Mansered plots gave pale yellow plants at germination. But after 3-4 days they came to the normal colour.  
(ii) N.A.  
(iii) Grain yield.  
(iv) (a) to (c) N.A.  
(v) (a) and (b) N.A.  
(vi) and (vii) Nil.

5. RESULTS :
(i) 545.23 lb./ac.
(ii) 58.35 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>591.2</td>
<td>29.17 lb./ac.</td>
</tr>
<tr>
<td>2</td>
<td>504.0</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>542.6</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).  
Site :- Govt. Exptl. Farm, Chindwara.  
Type :- 'M'.

Object :—To compare the effect of cotton cake on Wheat with that of G.N.C. and A/S.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A.  
(ii) (a), (b) N.A.  
(iii) 3.11.1951.  
(iv) (a) to (c) N.A.  
(v) N.A.  
(vi) Hy. 11-6 (early).  
(vii) N.A.  
(viii) N.A.  
(ix) N.A.  
(x) 24.3.1952.

2. TREATMENTS :
1. Control.
2. 20 lb./ac. of N as G.N.C.
3. 20 lb./ac. of N as decorcicated cotton cake.
4. 20 lb./ac. of N as undecorciicated cotton cake.
5. 20 lb./ac. of N as A/S.

3. DESIGN :
(i) L. Sq.  
(ii) (a) 5.  
(b) N.A.  
(iii) 5.  
(iv) (a), (b) 1/40 ac.  
(v) Nil.  
(vi) No.

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

5. RESULTS :
(i) 654.4 lb./ac.  
(ii) 56.8 lb./ac.  
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>612</td>
</tr>
<tr>
<td>2.</td>
<td>688</td>
</tr>
<tr>
<td>3.</td>
<td>672</td>
</tr>
<tr>
<td>4.</td>
<td>648</td>
</tr>
<tr>
<td>5.</td>
<td>652</td>
</tr>
</tbody>
</table>

S.E./mean = 25.4 lb./ac.

Crop: Wheat (Rabi).
Site: Govt. Exptl. Farm, Chhindwara.
Object: To compare the effect of C/N on Wheat with lime and A/S.

1. BASAL CONDITIONS:
(i) (a) to (e) N.A. (ii) (a) Karhar. (b) N.A. (iii) 7.11.1952. (iv) (a) to (e) N.A. (v) N.A. (vi) 11/5-7-2 in 3 replications and Hy 65-4 in other 3 replications. (vii) to (ix) N.A. (x) 11.3.1953

2. TREATMENTS:
1. No manure.
2. Lime at 200 lb./ac.
3. 20 lb./ac. of N as A/S.
4. 40 lb./ac. of N as A/S.
5. 20 lb./ac. of N as C/N.
6. 40 lb./ac. of N as C/N.

Manures drilled with seed.

3. DESIGN:
(i) R.B.D. (ii) (a) 6 (3 replications for each variety). (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) N.A.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952—N.A. (b) N.A. (c) Nil. (v) (a) Raipur, Powerkhelda. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Variety Hy 5-7-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield of grain in lb./ac.</td>
</tr>
<tr>
<td>1. 476.4</td>
</tr>
<tr>
<td>2. 378.0</td>
</tr>
<tr>
<td>3. 504.8</td>
</tr>
<tr>
<td>4. 446.4</td>
</tr>
<tr>
<td>5. 359.7</td>
</tr>
<tr>
<td>6. 201.5</td>
</tr>
<tr>
<td>S.E./mean = 34.12 lb./ac.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variety Hy 65-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield of grain in lb./ac.</td>
</tr>
<tr>
<td>1. 449.2</td>
</tr>
<tr>
<td>2. 587.7</td>
</tr>
<tr>
<td>3. 682.4</td>
</tr>
<tr>
<td>4. 549.9</td>
</tr>
<tr>
<td>5. 384.8</td>
</tr>
<tr>
<td>6. 226.5</td>
</tr>
<tr>
<td>S.E./mean = 56.16 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi).
Site: Govt. Exptl. Farm, Chhindwara.
Object: To study the effect of C/N on Wheat.

Ref: M.P. 52(70).
Type: 'M'.
2. TREATMENTS:

All combinations of (1) and (2)
(1) 3 levels of N: N_0 = 0, N_1 = 15 and N_2 = 30 lb./ac.
(2) 2 sources of N: S_1 = C/N and S_2 = A/S.

9. DESIGN:

(i) 3 x 2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) and (vi) N.A.

4. GENERAL:

(j) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) N.A.

5. RESULTS:

(i) 324 lb./ac.
(ii) 127.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

Control \[=350 \text{ lb./ac.}\]

<table>
<thead>
<tr>
<th></th>
<th>(S_1)</th>
<th>(S_2)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>(N_1)</td>
<td>333</td>
<td>392</td>
<td>363</td>
</tr>
<tr>
<td>(N_2)</td>
<td>197</td>
<td>345</td>
<td>271</td>
</tr>
<tr>
<td>Mean</td>
<td>265</td>
<td>369</td>
<td>317</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean \[=40.17 \text{ lb./ac.}\]
S.E. of body of table \[=56.80 \text{ lb./ac.}\]

Crop: Wheat.

Ref. M.P. 53 (30).

Site: Govt Seed and Demonstration Farm, Damoh.

Type: 'M'.

Object: To determine the effect of Sodium nitrate on Wheat.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Kabar. (b) N.A. (iii) 26.10.1953. (iv) (a) Bakkaring. (b) Drilling. (c) 80 lb./ac. (d) and (e) N.A. (v) Nil. (vi) 11.6 (medium). (vii) Unirrigated. (viii) Nil. (ix) 2 83°. (x) 3.4.1954.

2. TREATMENTS:

1. Control (two plots in each block).
2. 15 lb./ac. of N as A/S.
3. 30 lb./ac. of N as A/S.
4. 15 lb./ac. of N as C/N.
5. 30 lb./ac. of N as C/N.
6. 2 mds. of G.N.C.+11 md./ac. of A/S.

3. DESIGN:

(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 5. (iv) (a) and (b) 50’-8” x 2’-6” (v) Nil. (vi) Yes.

4. GENERAL:

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

5. RESULTS:

(i) 347.9 lb./ac.
(ii) 89.2 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>333.1</td>
</tr>
<tr>
<td>2.</td>
<td>475.4</td>
</tr>
<tr>
<td>3.</td>
<td>410.9</td>
</tr>
<tr>
<td>4.</td>
<td>206.9</td>
</tr>
<tr>
<td>5.</td>
<td>162.4</td>
</tr>
<tr>
<td>6.</td>
<td>293.9</td>
</tr>
</tbody>
</table>

S.E./mean for treatments 2 to 6 = 39.9 lb./ac.
S.E./mean for treatment 1 = 28.2 lb./ac.

Crop: Wheat.

Site: Govt. Seed and Demonstration Farm, Damoh. Type: 'M'.

Object: To study the effect of cotton seed cake on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Kakhar. (b) N.A. (iii) 2.10.1951. (iv) (a) 5 ha./ha. (b) Seeds drilled. (c) to (e) N.A. (v) N.A. (vi) 3-11. (vii) N.A. (viii) N.A. (ix) N.A. (x) 25.3.1952.

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as G.N.C.
   3. 20 lb./ac. of N as decorticated cotton seed cake.
   4. 20 lb./ac. of N as A/S.
   5. 20 lb./ac. of N as undecorticated cotton seed cake.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 33' 33'. (v) Nil. (vi) N.A.

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

5. RESULTS:
   (i) 409.5 lb./ac.
   (ii) 22.64 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>389.0</td>
</tr>
<tr>
<td>2.</td>
<td>428.0</td>
</tr>
<tr>
<td>3.</td>
<td>406.5</td>
</tr>
<tr>
<td>4.</td>
<td>429.4</td>
</tr>
<tr>
<td>5.</td>
<td>400.5</td>
</tr>
</tbody>
</table>

S.E./mean = 10.1 lb./ac.

Crop: Wheat (Rabi).

Site: Govt. Seed and Demonstration Farm, Dindori. Type: 'M'.

Object: To compare the effect of different manures and fertilizers.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) to (iv) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS:
   1. No manure.
   2. 20 lb./ac. of N as A/S.
   3. 10 lb./ac. of N as G.N.C.+10 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super.
   4. 20 lb./ac. of N as F.Y.M.
   5. 10 lb./ac. of N as F.Y.M.+10 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super.
3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) N.A.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) N.A.

5. RESULTS:
   (i) 700 lb./ac.
   (ii) 23.96 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>660</td>
</tr>
<tr>
<td>2.</td>
<td>741</td>
</tr>
<tr>
<td>3.</td>
<td>698</td>
</tr>
<tr>
<td>4.</td>
<td>699</td>
</tr>
<tr>
<td>5.</td>
<td>682</td>
</tr>
<tr>
<td>6.</td>
<td>722</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=9.78 lb./ac.</td>
</tr>
</tbody>
</table>

  Crop: Wheat (Rabi).  
   Site: Govt. Seed and Demonstration Farm, Dindori. Type: ‘M’.

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

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) to (iv) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N: N_0=0, N_1=15, N_2=30 lb./ac.
   (2) 2 sources of N: S_1=C/N and S_2=A/S.

3. DESIGN:
   (i) 3 x 2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 66’x16’. (v) N.A. (vi) Yes.

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

5. RESULTS:
   (i) 348 lb./ac.
   (ii) 64.45 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>S_1</th>
<th>S_2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>332 lb./ac.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N_1</td>
<td>329</td>
<td>351</td>
<td>340</td>
</tr>
<tr>
<td>N_2</td>
<td>367</td>
<td>361</td>
<td>364</td>
</tr>
<tr>
<td>Mean</td>
<td>348</td>
<td>356</td>
<td>352</td>
</tr>
</tbody>
</table>

   S.E. of any marginal mean = 18.60 lb./ac.
   S.E. of bocy of table = 26.31 lb./ac.
Crop: - Wheat (Rabi).
Site: - Central Res. Farm, Gwalior.

Object: - To find out suitable combination of N and P\textsubscript{2}O\textsubscript{5} for Wheat crop under irrigated condition.

1. **BASAL CONDITIONS**:

2. **TREATMENTS**:
   All combinations of (1) and (2)
   (1) 2 levels of P\textsubscript{2}O\textsubscript{5} as Super: P\textsubscript{0} = 0 and P\textsubscript{1} = 20 lb./ac.
   (2) 5 levels of N as A/S: N\textsubscript{0} = 0, N\textsubscript{1} = 10, N\textsubscript{2} = 20, N\textsubscript{3} = 30 and N\textsubscript{4} = 40 lb./ac.

3. **DESIGN**:
   (i) 2 x 5 Fact. in R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 6.  (iv) (a) 18' x 96'.  (b) 12' x 90'.  (v) 3' around.  (vi) Yes.

4. **GENERAL**:
   (i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) to (c) N.A.  (v) N.A.  (vi) N.A.  (vii) N.A.

5. **RESULTS**:
   (i) 1246 lb./ac.
   (ii) 409.2 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N\textsubscript{0}</th>
<th>N\textsubscript{1}</th>
<th>N\textsubscript{2}</th>
<th>N\textsubscript{3}</th>
<th>N\textsubscript{4}</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1372</td>
<td>1032</td>
<td>1108</td>
<td>1283</td>
<td>1372</td>
<td>1233</td>
</tr>
<tr>
<td>1200</td>
<td>1467</td>
<td>1269</td>
<td>1248</td>
<td>1113</td>
<td>1259</td>
</tr>
<tr>
<td>Mean</td>
<td>1286</td>
<td>1249</td>
<td>1188</td>
<td>1265</td>
<td>1242</td>
</tr>
</tbody>
</table>

S.E. of N marginal means = 118.1 lb./ac.
S.E. of P marginal means = 74.7 lb./ac.
S.E. of body of table = 157.0 lb./ac.

Crop: - Wheat.
Site: - Central Res. Farm, Gwalior.

Object: - To find out suitable manurial dose for Wheat under irrigation.

1. **BASAL CONDITIONS**:
   (i) (a) N.A.  (b) Sannhemp for G.M.  (c) N.A.  (ii) (a) Sandy loam.  (b) N.A.  (iii) 13.11.1950.  (iv) (a) Disc harrowing, ploughing by sabul and desi plough.  (b) Seeds drilled.  (c) 80 lb./ac.  (d) 12'.  (e) N.A.  (v) Sannhemp as G.M.  (vi) Pbc. = 591.  (vii) Irrigated.  (viii) N.A.  (ix) N.A.  (x) N.A.

2. **TREATMENTS**:
   1. Control (no manure).
   2. 20 lb./ac. of N.
   3. 40 lb./ac. of N.
   4. 60 lb./ac. of N.
   5. 80 lb./ac. of N.
   6. 20 lb./ac. of N+20 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
   7. 20 lb./ac. of N+40 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
   8. 40 lb./ac. of N+60 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
   9. 40 lb./ac. of N+40 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
   10. 40 lb./ac. of N+60 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
   11. 40 lb./ac. of N+80 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
   12. 20 lb./ac. of N+20 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
   13. Source of N for treatments 2 to 8 is A/S while for 9 to 11 is A/S and N.G.C. in equal ratios.  P\textsubscript{2}O\textsubscript{5} as Super.  Manures applied on 10.3.1950.

3. **DESIGN**:
   (i) R.B.D.  (ii) (a) 11.  (b) 78' x 132'.  (iii) 6.  (iv) (a) 78' x 12'.  (b) 72' x 3'.  (v) 3' x 2'.  (vi) Yes.
4. GENERAL:
(i) Good. (ii) N.A. (iii) Percentage germination and yield of wheat grain. (iv) (a) 1950 to 1951. (b) Nil. (c) N.A. (v) (a) Indore. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 4.85 lb./ac.
(ii) 403.2 lb./ac.
(iii) Treatments do not differ significantly.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2559</td>
<td>7.</td>
<td>2600</td>
</tr>
<tr>
<td>2.</td>
<td>2419</td>
<td>8.</td>
<td>2690</td>
</tr>
<tr>
<td>3.</td>
<td>2403</td>
<td>9.</td>
<td>2460</td>
</tr>
<tr>
<td>4.</td>
<td>2435</td>
<td>10.</td>
<td>2567</td>
</tr>
<tr>
<td>5.</td>
<td>2345</td>
<td>11.</td>
<td>2542</td>
</tr>
<tr>
<td>6.</td>
<td>2403</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean =164.6 lb./ac.

Crop :- Wheat.  Ref :- M.P. 51(51).
Site :- Central Res. Farm, Gwalior.  Type :- 'M'.

Object :- To find out a suitable manural dose for Wheat under irrigation with a view to obtain maximum out turn.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 6.12.1951. (iv) (a) desi ploughing and 
patella. (b) N.A. (c) 80 lb./ac. (d) 12".  (e) N.A.  (v) N.A.  (vi) C-591 (medium).  (vii) Irrigated.  (viii) N.A.  (ix) 2.12".  (a) N.A.

2. TREATMENTS:
1. Control (no manure).
2. 20 lb./ac. of N.
3. 40 lb./ac. of N.
4. 60 lb./ac. of N.
5. 80 lb./ac. of N.
6. 20 lb./ac. of N+20 lb./ac. of P2O5.
Source of N for treatments 2 to 8 is A/S while for treatments 9 to 11 is A/S and G.N.C. in 1 : 1 ratio. P2O5 as Super. Manures applied in 3 replications before sowing and in 3 replications it is applied a month after sowing.

3. DESIGN:
(i) R.B.D.  (ii) (a) 11. (b) N.A.  (iii) 3 for each time of application of fertilizers.  (iv) (a) 15'×90'. (b) 12'×90'.  (v) 3' around.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Grain and straw yield.  (iv) (a) 1950-51—N.A.  (b) to (c) N.A.  (v) (a) Bagwai.  (b) N.A.  (vi) Crop was damaged to an extent of about 5% on an average by hailstones.  (vii) Nil.

5. RESULTS:
Manured before sowing
(i) 349.03 lb./ac.
(ii) 48.85 lb./ac.
(iii) Treatments do not differ significantly.

Manured a month after sowing
(i) 374.38 lb./ac.
(ii) 63.20 lb./ac.
(iii) Treatments do not differ significantly.
### Treatment of Grain in lb/acre

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>324.0</td>
</tr>
<tr>
<td>2.</td>
<td>380.8</td>
</tr>
<tr>
<td>3.</td>
<td>395.8</td>
</tr>
<tr>
<td>4.</td>
<td>360.7</td>
</tr>
<tr>
<td>5.</td>
<td>327.3</td>
</tr>
<tr>
<td>6.</td>
<td>329.0</td>
</tr>
<tr>
<td>7.</td>
<td>324.0</td>
</tr>
<tr>
<td>8.</td>
<td>344.0</td>
</tr>
<tr>
<td>9.</td>
<td>360.7</td>
</tr>
<tr>
<td>10.</td>
<td>359.0</td>
</tr>
<tr>
<td>11.</td>
<td>344.0</td>
</tr>
</tbody>
</table>

\[ \text{S.E./mean} = 28.20 \text{ lb/acre} \]

### Treatments

1. No manure.
2. Udid at 40 lb/acre.
3. Moong at 40 lb/acre.
4. Guar at 50 lb/acre.
5. Sann hemp at 80 lb/acre.

### Design

(i) R.B.D. (ii) 6. (b) 84' x 116'. (iii) 4. (iv) 116' x 116'. (b) 112' x 8'. (v) 3' around. (vi) Yes.

### General

(i) Good. (ii) N.A. (iii) Grain yield. (iv) Av. yield 1950-1954. (b) N.A. (c) N.A. (d) N.A. (e) and b N.A. (f) and (vii) Nil.

### Results

1. 1970 lb/acre.
2. 1078 lb/acre.
3. 1580 lb/acre.
4. 1210 lb/acre.
5. 1251 lb/acre.

\[ \text{S.E./mean} = 139.9 \text{ lb/acre} \]
Crop :- Wheat.

Site :- Central Res. Farm, Gwalior.

Object :- To find out a suitable green manure for Wheat and compare it with F.Y.M.

1. BASAL CONDITIONS:
   (a) N.A.   (b) As per treatments. (c) N.A. (ii) (a) Sandy loam   (b) Refer soil analysis, Gwalior. (iii) 15.11.1951. (iv) (a) Desi plough and patella. (b) N.A. (c) N.A. (d) 12". (e) N.A. (v) Nil. (vi) Pb. C-591. (vii) Irrigated. (viii) N.A. (ix) 2.12". (x) N.A.

2. TREATMENTS:
   1. No manure.
   2. *Udid* as G.M. at 40 lb./ac. seedrate broadcasted.
   3. *Moong* as G.M. at 40 lb./ac. seedrate broadcasted.
   4. *Guar* as G.M. at 50 lb./ac. seedrate broadcasted.
   5. *Sannhemp* as G.M. at 80 lb./ac. seedrate broadcasted.
   6. F.Y.M. at 10 C.L./ac. given to wheat.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 4. (iv) (a) 14'x116'. (b) 8'x110'. (v) 3' alround. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1950 to 1954. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1583 lb./ac.
   (ii) 129.0 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1491</td>
</tr>
<tr>
<td>2.</td>
<td>1658</td>
</tr>
<tr>
<td>3.</td>
<td>1646</td>
</tr>
<tr>
<td>4.</td>
<td>1765</td>
</tr>
<tr>
<td>5.</td>
<td>1609</td>
</tr>
<tr>
<td>6.</td>
<td>1528</td>
</tr>
</tbody>
</table>

   S.E./mean = 64.50 lb./ac.

---

Crop :- Wheat.

Site :- Central Res. Farm, Gwalior.

Object :- To find out a suitable G.M. crop for Wheat and compare it with F.Y.M.

1. BASAL CONDITIONS:
   (i) (a) N.A.   (b) As per treatments. (c) Nil. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) N.A. (iv) (a) N.A. (b) Seeds drilled. (c) 40 seer/ac. (d) 12". (e) N.A. (v) Nil. (vi) Pb. C-591. (vii) N.A. (viii) N.A. (ix) 3.26". (x) N.A.

2. TREATMENTS:
   1. No manure.
   2. *Udid* as G.M., seedrate 40 lb./ac.
   3. *Moong* as G.M., seedrate 40 lb./ac.
   4. *Guar* as G.M., seedrate 60 lb./ac.
   5. *Soyabean* as G.M., seedrate 50 lb./ac.
   6. *Sannhemp*, seedrate 80 lb./ac.
   7. F.Y.M. at 10 C.L./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) 116'x84'. (iii) 4. (iv) (a) 116'x12'. (b) 110'x8'. (v) 3' alround. (vi) Yes.
4. GENERAL:
   (i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1950 to 1954.  (b) and (c) N.A.  (v) (a) and (b) N.A.  (vi) Nil.  (vii) Yield data and S.E.—N.A.

5. RESULTS:
   (i) 1271 lb./ac.
   (ii) N.A.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1019</td>
</tr>
<tr>
<td>2.</td>
<td>1411</td>
</tr>
<tr>
<td>3.</td>
<td>1279</td>
</tr>
<tr>
<td>4.</td>
<td>1428</td>
</tr>
<tr>
<td>5.</td>
<td>1372</td>
</tr>
<tr>
<td>6.</td>
<td>1174</td>
</tr>
<tr>
<td>7.</td>
<td>1212</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Site :- Central Res. Farm, Gwalior.  
Objec:—To find out suitable G.M. crop for Wheat.

Ref:- M.P. 53(72).  
Type :- 'M'.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) G.M. crops.  (c) Nil.  (ii) (a) Sandy loam.  (b) N.A.  (iii) 29.12.1953.  (iv) (a) Bakharing.  
   (b) to (e) N.A.  (v) N.A.  (vi) C-591.  (vii) Irrigated.  (viii) N.A.  (ix) 2.13'.  (x) N.A.

2. TREATMENTS:
   1. No manure.
   2. Udid at seed rate of 40 lb./ac.
   3. Moong at seed rate of 40 lb./ac.
   4. Guar at seed rate of 50 lb./ac.
   5. Soyabeans at seed rate of 50 lb./ac.
   6. Sannhemp at seed rate of 80 lb./ac.
   7. F.Y.M. at 10 C.L./ac.
   Green manure crop sown on 21.7.1953, buried in by ploughing on 15.9.1953.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 7.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 108'x6'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1950 to 1954.  (b) No.  (c) N.A.  (v) (a) Nil.  (b) N.A.  
   (vi) N.A.  (vii) The yield is very poor.

5. RESULTS:
   (i) 541 lb./ac.
   (ii) 110.3 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>528</td>
</tr>
<tr>
<td>2.</td>
<td>534</td>
</tr>
<tr>
<td>3.</td>
<td>504</td>
</tr>
<tr>
<td>4.</td>
<td>620</td>
</tr>
<tr>
<td>5.</td>
<td>509</td>
</tr>
<tr>
<td>6.</td>
<td>571</td>
</tr>
<tr>
<td>7.</td>
<td>470</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>55.13 lb./c.</td>
</tr>
</tbody>
</table>

---
Crop: Wheat.  
Site: Central Res. Farm, Gwalior.  
Ref: M.P. 50(57).  
Type: 'M'.

Object: To find the optimum seedrate for sannhemp for green manuring, the response to G.M. being judged by the outturn of Wheat crop following G.M.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Sannhemp for G.M. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior.  
   (iii) 31.10.1950. (iv) (a) Suction ploughing and discing. Sann was ploughed in on 23.9.1950. (b) Drilled. (c) 40 seers/ac. (d) 12". (e) N.A. (v) Nil. (vi) Pb. C-591. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   6 seedrates of sannhemp: G0 = 0, G1 = 40, G2 = 60, G3 = 80, G4 = 100 and G5 = 120 lb/ac.  
   Sannhemp grown just before wheat sowing on 31.7.1950 to serve as green manuring.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) 126' x 108'. (iii) 4. (iv) (a) 126' x 18'. (b) 120' x 12'. (v) 3' around. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Green weight of sannhemp added to the soil and grain yield. (iv) (a) 1950 to 1952. (b) and (c) N.A. (v) N.A. (vi) Nil. (vii) Yield data — N.A.

5. RESULTS:
   (i) 2604 lb/ac.  
   (ii) 131.6 lb/ac.  
   (iii) Treatments do not differ significantly.  
   (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>G0</td>
<td>2559</td>
</tr>
<tr>
<td>G1</td>
<td>2691</td>
</tr>
<tr>
<td>G2</td>
<td>2559</td>
</tr>
<tr>
<td>G3</td>
<td>2765</td>
</tr>
<tr>
<td>G4</td>
<td>2501</td>
</tr>
<tr>
<td>G5</td>
<td>2551</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>65.8 lb/ac</td>
</tr>
</tbody>
</table>

Crop: Wheat.  
Site: Central Res. Farm, Gwalior.  
Ref: M.P. 51(48).  
Type: 'M'.

Object: To find the optimum seedrate of Sannhemp for G.M, the response of G.M. to be measured by the outturn of subsequent crop of Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Sannhemp for G.M. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior.  
   (iii) 2.12.1951. (iv) (a) Desi ploughing and patella. (b) N.A. (c) 80 lb/ac. (d) 12". (e) N.A. (f) N.A. (g) Pb. C-591 (medium). (h) Irrigated. (i) N.A. (j) 2.12". (k) April 1952.

2. TREATMENTS:
   6 seedrates of Sannhemp: G0 = 0, G1 = 40, G2 = 60, G3 = 80, G4 = 100 and G5 = 120 lb/ac.  
   Sannhemp grown just before wheat sowing on 31.1.1950 to serve as G.M.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) 108' x 126'. (iii) 4. (iv) (a) 18' x 126'. (b) 12' x 120'. (v) 3' around. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1950 to 1952. (b) and (c) N.A. (v) N.A. (vi) N.A. (vii) 40% damage by hails.

5. RESULTS:
   (i) 690.2 lb/ac.  
   (ii) 70.79 lb/ac.  
   (iii) Treatments do not differ significantly.
Crop: - Wheat.  
Ref: - M.P. 52(60).

Site: - Central Res. Farm, Gwalior.  
Type: - 'M'.

Object: - To find out the optimum seedrate of sannhemp for G.M. and the effect of application of P₂O₅ in wheat crop.

1. BASAL CONDITIONS:  
(i) (a) N.A.  (b) Sannhemp for G.M.  (c) Nil.  (ii) Sandy loam.  (b) Refer soil analysis, Gwalior.
(ii) N.A.  (iv) (a) N.A.  (b) Seeds drilled.  (c) N.A.  (d) 12".  (e) N.A.  (v) N.A.  (vi) P₂O₅: C-591.  (vii) Nil.

2. TREATMENTS:  
6 seedrates of sannhemp: G₀ = 0, G₁ = 40, G₂ = 60, G₃ = 80, G₄ = 100 and G₅ = 120 lb./ac.
Sannhemp sown on 14/7/1952.

3. DESIGN:  
(i) R.B.D.  (ii) 6.  (b) 1 1/2' x 10'.  (iii) 4.  (iv) (a) 12' x 18'  (b) 12' x 2'.  (v) 3 rows on both sides and 3' of each row at both ends.  (vi) Yes.

4. GENERAL:  
(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1950 to 1952.  (b) and (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:  
(i) 1883 lb./ac.  
(ii) 287.3 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>G₀</td>
<td>2005</td>
</tr>
<tr>
<td>G₁</td>
<td>2110</td>
</tr>
<tr>
<td>G₂</td>
<td>1853</td>
</tr>
<tr>
<td>G₃</td>
<td>1660</td>
</tr>
<tr>
<td>G₄</td>
<td>1894</td>
</tr>
<tr>
<td>G₅</td>
<td>1773</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>143.5 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: - Wheat (Rabi).  
Ref: - M.P. 53(74).

Site: - Central Res. Farm, Gwalior.  
Type: - 'M'.

Object: - To find out suitable seedrate for sannhemp for G.M. and the effect of application of P₂O₅ in wheat crop.

1. BASAL CONDITIONS:  
(i) (a) N.A.  (b) Sannhemp for G.M.  (c) Nil.  (ii) (a) Sandy loam.  (b) Refer soil analysis, Gwalior.  
2. **TREATMENTS:**

   **Main-plot treatments:**
   6 levels of seedrate for sannhemp: \( G_0 = 0 \), \( G_1 = 40 \), \( G_2 = 60 \), \( G_3 = 80 \), \( G_4 = 100 \) and \( G_5 = 120 \) Ib./ac.

   **Sub-plot treatments:**
   2 levels of \( P_0 \) : \( P_0 = 0 \) and \( P_1 = 40 \) Ib./ac.

3. **DESIGN:**
   (i) Split-plot. (ii) (a) 6 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 55'x12'. (v) N.A. (vi) Yes.

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

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

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>( G_0 )</td>
<td>1176</td>
<td>( P_0 )</td>
<td>1329</td>
</tr>
<tr>
<td>( G_1 )</td>
<td>1403</td>
<td>( P_1 )</td>
<td>1391</td>
</tr>
<tr>
<td>( G_2 )</td>
<td>1409</td>
<td>G.M.</td>
<td>1360</td>
</tr>
<tr>
<td>( G_3 )</td>
<td>1365</td>
<td>S.E./mean</td>
<td>11.66 lb./ac.</td>
</tr>
<tr>
<td>( G_4 )</td>
<td>1411</td>
<td>Significance</td>
<td>Not significant.</td>
</tr>
<tr>
<td>( G_5 )</td>
<td>1396</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G.M.</td>
<td>1360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>33.6 lb./ac.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Significance</td>
<td>Not significant.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Crop:** Wheat (Rabi).

**Site:** Central Res. Farm, Gwalior.

**Ref:** M.P. 53(56).

**Type:** 'M'.

Object:—To find the effect of different doses of B.M. on the growth and yield of Wheat.

1. **BASAL CONDITIONS:**
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 23.12.1953. (iv) (a) N.A. (b) Seeds drilled. (c) 80 lb./ac. (d) 12'. (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (viii) N.A. (ix) 2.13'. (x) 25.4.1954.

2. **TREATMENTS:**
   4 levels of \( P_0\) : \( P_0 = 0 \), \( P_1 = 40 \), \( P_2 = 80 \) and \( P_3 = 120 \) lb./ac.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 4. (b) 75'x80'. (iii) 6. (iv) (a) 80'x18'. (b) 72'x12'. (v) 3'x4'. (vi) Yes.

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

5. **RESULTS:**
   (i) 673.5 lb./ac.
   (ii) 189.23 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P_0 )</td>
<td>762.0</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>620.5</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>696.2</td>
</tr>
<tr>
<td>( P_3 )</td>
<td>705.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>77.11 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Wheat
Site: Central Res. Farm, Gwalior.

Object: To find the best dose of fertilizers for irrigated Wheat.

1. BASAL CONDITIONS:
   (i) a) to c) N.A., (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 22.12.1953. (iv) (a) N.A. (b) Seeds drilled. (c) 40 cm/sec. (d) 12'. (e) N.A. (v) N.A. (vi) NP 710 (medium). (vii) Irrigated. (viii) N.A. (a) 2.11'. (x) 3.4.1954.

2. TREATMENTS:
   Main-plot treatments:
   3 levels of P_2O_5 as Super: P_0 = 0, P_1 = 30 and P_2 = 60 lb./ac.
   Sub-plot treatments:
   2 times of application of A/S: T_1 = A/S applied at the time of first irrigation and T_2 = 1/2 A/S applied at the time of first irrigation and 1/2 at the stage of flowering.
   Sub-sub-plot treatments:
   5 doses of N as N/A: N_0 = 0, N_1 = 20, N_2 = 40, N_3 = 60 and N_4 = 80 lb./ac.
   P_2O_5 applied on 21.12.1953.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main-plots/block, 2 sub-plots/main-plot and 5 sub-sub-plots/sub-plot. (b) 165' X 84'. (iii) 3. (iv) (a) Main-plot: 165' X 28', sub-plot: 165' X 14' and sub-sub-plot: 33' X 10'. (b) Sub-sub-plot: 22'. (v) 3 X 2'. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1953-1954. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) N.A.

5. RESULTS:
   (i) 341.0 lb./ac.
   (ii) (a) 33.9 lb./ac.
   (b) 97.6 lb./ac.
   (c) 94.0 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N_0</th>
<th>N_1</th>
<th>N_2</th>
<th>N_3</th>
<th>N_4</th>
<th>Mean</th>
<th>T_1</th>
<th>T_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>M_1</td>
<td>174</td>
<td>258</td>
<td>289</td>
<td>215</td>
<td>238</td>
<td>234</td>
<td>228</td>
</tr>
<tr>
<td>M_2</td>
<td>346</td>
<td>302</td>
<td>389</td>
<td>406</td>
<td>437</td>
<td>376</td>
<td>414</td>
</tr>
<tr>
<td>M_3</td>
<td>456</td>
<td>376</td>
<td>484</td>
<td>396</td>
<td>362</td>
<td>412</td>
<td>470</td>
</tr>
<tr>
<td>Mean</td>
<td>321</td>
<td>312</td>
<td>387</td>
<td>339</td>
<td>345</td>
<td>31.1</td>
<td>30.7</td>
</tr>
<tr>
<td>T_1</td>
<td>322</td>
<td>227</td>
<td>414</td>
<td>330</td>
<td>363</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T_2</td>
<td>350</td>
<td>267</td>
<td>369</td>
<td>298</td>
<td>327</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of the difference of two
1. P marginal means = 81.06 lb./ac.
2. T marginal means = 20.53 lb./ac.
3. N marginal means = 31.35 lb./ac.
4. T means at the same level of P = 35.64 lb./ac.
5. P means at the same level of T = 94.88 lb./ac.
6. N means at the same level of P = 54.37 lb./ac.
7. T means at the same level of N = 95.44 lb./ac.
8. N means at the same level of T = 44.27 lb./ac.
9. T means at the same level of N = 44.69 lb./ac.
Object: To find out the response of Sodium Nitrate to Wheat crop in comparison to A/S.

1. BASAL CONDITIONS:
   (i) N.A. (b) Wheat. (c) N.A. (d) Sandy loam. (d) Refer soil analysis, Gwalior. (iii) 20.11.1951.
   (iv) (a) Sabul and desi plough and patella. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Pb. C-591. (vii) Irrigated. (viii) N.A. (ix) 2.52". (x) 7.4.1952.

2. TREATMENTS:
   All combinations of (1) and (2)
   2 doses of line : \( L_0 = 0 \) and \( L_1 = 200 \) lb./ac.
   5 doses of N : \( N_0 = 0, N_1 = 20 \) lb./ac. of N as A/S, \( N_2 = 40 \) lb./ac. of N as A/S, \( N_3 = 20 \) lb./ac. of N as C/N and \( N_4 = 40 \) lb./ac. of N as C/N.

3. DESIGN:
   (i) 5x2 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 18'x96'. (b) 12'x90'. (v) 3' a round. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951-N.A. (b) and (c) N.A. (v) (a) Gwalior. Bagwai, Indore. (b) N.A. (vi) 60% damage due to hails. (vii) Nil.

5. RESULTS:
   (i) 409.9 lb./ac.
   (ii) 70.15 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
<th>( N_4 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_0 )</td>
<td>348.7</td>
<td>466.2</td>
<td>445.0</td>
<td>387.5</td>
<td>337.5</td>
<td>397.0</td>
</tr>
<tr>
<td>( L_1 )</td>
<td>367.5</td>
<td>405.0</td>
<td>437.5</td>
<td>443.8</td>
<td>460.0</td>
<td>422.8</td>
</tr>
<tr>
<td>Mean</td>
<td>358.1</td>
<td>435.6</td>
<td>441.2</td>
<td>415.6</td>
<td>388.7</td>
<td>409.9</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N
S.E. of marginal mean of L
S.E. of body of table

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Object: To see the comparative effect of blood meal on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Kabar. (b) Refer soil analysis, Jabalpore. (iii) 23.10.1951. (iv) (a) Bakharing.
   (b) to (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) N.A. (viii) N.A. (ix) NA. (x) 9.4.1952.

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as F.Y.M.
   3. 20 lb./ac. of N as bloodmeal.
   4. 20 lb./ac. of N as G.N.C.
   5. 20 lb./ac. of N as A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) S. (b) N.A. (iii) 4. (iv) (a) 1/40 ac. (b) 33'x164'. (v) N.A. (vi) Yes.
4. GENERAL:

(i) Good in the beginning. Later crop suffered for want of moisture in the soil. Few patches in replication III due to whithering of plant. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1951 to 1955. (b) N.A. (c) N.A. (d) N.A. (e) N.A. (f) Nil. (v) Season not favourable for the crop. Yield of wheat is poor.

5. RESULTS:

(i) 262.4 lb./ac.
(ii) 31.52 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>212.6</td>
</tr>
<tr>
<td>2.</td>
<td>252.2</td>
</tr>
<tr>
<td>3.</td>
<td>322.4</td>
</tr>
<tr>
<td>4.</td>
<td>212.6</td>
</tr>
<tr>
<td>5.</td>
<td>312.2</td>
</tr>
</tbody>
</table>

S.E./mean = 15.76 lb./ac.

Crop :- Wheat.
Site :- Adhartal Farm, Jabalpore.

Object :- To study the effect of bloodmeal in comparison with other manures and fertilizers.

1. BASAL CONDITIONS:


2. TREATMENTS:

1. Control (no manure).
2. 70 lb./ac. of N as F.Y.M.
3. 20 lb./ac. of N as bloodmeal.
4. 20 lb./ac. of N as G.N.C.
5. 20 lb./ac. of N as A/S.

3. DESIGN:

(i) R.B D. (ii) 5. (b) N.A. (iii) 4. (iv) (a) 66’ x 161’. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Germination fairly satisfactory. Crop was poor in some plots. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1955. (b) and (c) N.A. (v) Nil. (vi) Nil. (vii) Nil.

5. RESULTS:

(i) 245.9 lb./ac.
(ii) 38.48 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>198.6</td>
</tr>
<tr>
<td>2.</td>
<td>207.4</td>
</tr>
<tr>
<td>3.</td>
<td>247.6</td>
</tr>
<tr>
<td>4.</td>
<td>267.4</td>
</tr>
<tr>
<td>5.</td>
<td>312.4</td>
</tr>
</tbody>
</table>

S.E./mean = 19.24 lb./ac.
Crop :- Wheat.  
Site :- Adhartal Farm, Jabalpore.  

Object :- To study the effect of bloodmeal in comparison with other manures and fertilizers.

1. BASAL CONDITIONS: 
(i) (a) to (c) N.A.  (ii) (a) Kabar 2. (b) Refer soil analysis, Jabalpore. (iii) 29.10.1953. (iv) (a) Bakha- 
aring. (b) Drilled. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) A.O. 90 (medium) (vii) Unirrigated. (viii) 
N.A. (ix) 0.98". (x) 29.3.1954.

2. TREATMENTS: 
1. Control (no manure) 
2. 20 lb./ac. of N as F.Y.M. 
3. 20 lb./ac. of N as Bloodmeal. 
4. 20 lb./ac. of N as G.N.C. 
5. 20 lb./ac. of N as A/S.

3. DESIGN: 
(i) R.B.D. (ii) 5. (b) N.A. (iii) 4. (iv) (a) 66'x16½'. 1/80 (v) N.A. (vi) Yes.

4. GENERAL: 
(i) Germination and tillering fair. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1955. (b) No. (c) 
N.A. (v) (a) Powarkheda, Raipur. (b) N.A. (vi) and (vii) Nil.

5. RESULTS: 
(i) 216.7 lb./ac. 
(ii) 88.40 lb./ac. 
(iii) Treatments do not differ significantly. 
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>161.2</td>
</tr>
<tr>
<td>2.</td>
<td>228.8</td>
</tr>
<tr>
<td>3.</td>
<td>210.0</td>
</tr>
<tr>
<td>4.</td>
<td>268.8</td>
</tr>
<tr>
<td>5.</td>
<td>214.8</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>44.20 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop :- Wheat.  
Site :- Adhartal Farm, Jabalpore.  

Object :- To compare the effect of T.C. in different doses with that of F.Y.M. and also to compare it with 
optimum does of G.N.C. and A/S.

1. BASAL CONDITIONS: 
(i) (a) to (c) N.A.  (ii) (a) Kabar 2. (b) Refer soil analysis, Jabalpore. (iii) 28, 29.10.1048. (iv) (a) 
Bakha-ringing in summer. (b) Sown by nari plough. (c) 100 lb./ac. (d) and (e) N.A. (v) Nil. (vi) A.O.90 

2. TREATMENTS: 
1. Control. 
2. 20 lb./ac. of N as G.N.C. 
3. 20 lb./ac. of N as T.C. 
4. 40 lb./ac. of N as T.C. 
5. 20 lb./ac. of N as cattle dung. 
6. 10 lb./ac. of N as G.N.C.

3. DESIGN: 
(i) R.B.D. (ii) 9. (b) N.A. (iii) 6. (iv) (a) 66′x16½′. (b) 1/60 ac. (v) N.A. (vi) Yes.

4. GENERAL: 
(i) N.A. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951 to 1955. (b) No. (c) N.A. (v) (a) Power-
kheda, Raipur, Bilaspur and Betul. (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 1863 lb./ac.
(ii) 460.56 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Avg. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1757</td>
</tr>
<tr>
<td>2.</td>
<td>1682</td>
</tr>
<tr>
<td>3.</td>
<td>1687</td>
</tr>
<tr>
<td>4.</td>
<td>1763</td>
</tr>
<tr>
<td>5.</td>
<td>1843</td>
</tr>
</tbody>
</table>

S.E./mean = 188.0 lb./ac.

---

**Crop:** Wheat (Rabi).

**Site:** Adhartal Farm, Jabalpore.

**Ref:** M.P. 49(59).

**Type:** ‘M’.

**Object:** To study the effect of T.C. on Wheat against other manures and fertilizers.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer soil analysis, Jabalpore. (iii) 25. 26.11.1949. (iv) (a) Bakharingon 25.11.1949. (b) to (e) N.A. (v) Nil. (vi) A.O. 50. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 25.4.1951.

2. TREATMENTS:

(a) Control.
(b) 20 lb./ac. of N as T.C.
(c) 40 lb./ac. of N as T.C.
(d) 20 lb./ac. of N as F.Y.M.
(e) 40 lb./ac. of N as F.Y.M.

3. DESIGN:

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 6×16×1. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1947 to 1951. (b) to (v) Nil. (vi) No. (vii) Nil.

5. RESULTS:

(a) 319.4 lb./ac.
(b) 76.18 lb./ac.
(iii) Treatment differences are significant.
(iv) Avg. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>328.0</td>
</tr>
<tr>
<td>2.</td>
<td>217.2</td>
</tr>
<tr>
<td>3.</td>
<td>224.0</td>
</tr>
<tr>
<td>4.</td>
<td>297.2</td>
</tr>
<tr>
<td>5.</td>
<td>360.4</td>
</tr>
</tbody>
</table>

S.E./mean = 31.10 lb./ac.

---

**Crop:** Wheat (Rabi).

**Site:** Adhartal Farm, Jabalpore.

**Ref:** M.P. 56(63).

**Type:** ‘M’.

**Object:** To study the effect of T.C. on Wheat against other manures and fertilizers.

1. BASAL CONDITIONS:

(a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) and (b) Refer soil analysis, Jabalpore. (iii) 3. 4.11.1950. (iv) (a) 2 Bakharingons. (b) to (e) N.A. (v) Nil. (vi) A.O. 50. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 25.4.1951.
2. TREATMENTS:

1. Control.
2. 40 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN:

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66 x 16. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Grain yield. (iv) (a) 1947 to 1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 880 lb./ac.
(ii) 90.34 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>755</td>
<td>6.</td>
<td>823</td>
</tr>
<tr>
<td>2.</td>
<td>764</td>
<td>7.</td>
<td>957</td>
</tr>
<tr>
<td>3.</td>
<td>849</td>
<td>8.</td>
<td>941</td>
</tr>
<tr>
<td>4.</td>
<td>847</td>
<td>9.</td>
<td>1089</td>
</tr>
<tr>
<td>5.</td>
<td>857</td>
<td>S.E./mean</td>
<td>36.9 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Ref: M. P. 51 (27)
Site: Adhartal Farm, Jabalpore.
Type: 'M'

Object: To find the value of T.C. in comparison with G. N. C., FYM and A/S on Wheat.

1. BASAL CONDITIONS.

(i) (a) to (e) N.A. (ii) (a) Kabar. (Heavy soil). (b) Soil analysis. Jabalpore. (iii) 9.10.11.1951. (iv) (a) Bakarseed. (b) to (e) N.A. (v) Nil. (vi) A.O. 90. (medium.) (vii) N.A. (viii) One weeding. (ix) N.A. (x) 12.4.1952.

2. TREATMENTS:

1. Control.
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN:

(i) R. B. D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) 1/33. (b) 33 x 16. (v) N.A. (vi) Yes.

4. GENERAL:

(i) Crop growth in earlier stages-later for want of moisture in the soil the growth was checked. (ii) Nil. (iii) Grain and Straw yield. (iv) (a) 1947 to 1951. (v) Jabalpore, and Saugor. (vi) Season was most unfavourable for the crop. (vii) Nil.

5. RESULTS:

(i) 528 lb./ac.
(ii) 114.4 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>360</td>
<td>6.</td>
<td>414</td>
</tr>
<tr>
<td>2.</td>
<td>368</td>
<td>7.</td>
<td>579</td>
</tr>
<tr>
<td>3.</td>
<td>493</td>
<td>8.</td>
<td>716</td>
</tr>
<tr>
<td>4.</td>
<td>484</td>
<td>9.</td>
<td>836</td>
</tr>
<tr>
<td>5.</td>
<td>504</td>
<td>S.E./mean</td>
<td>46.64 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Wheat.

Ref: M.P. 48(60).

Site: Adhartal Farm, Jabalpore.

Type ‘M’.

Object: To study the residual effect of T.C. and other manures and fertilisers.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a), (b) Refer soil analysis, Jabalpore. (iii) 14.11.49. (iv) (a) to (e) Nil. (v) Nil. (vi) A.O. 90. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 27.4.30.

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as T.C.
   3. 40 lb./ac. of N as T.C.
   4. 20 lb./ac. of N as F.Y.M.
   5. 40 lb./ac. of N as F.Y.M.
   Manures applied to previous wheat crop.

3. DESIGN:
   (i) R. B. D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) 66'x16'. (b) 1/60 ac. (v) N.A. (vi) N.A. (vii) Nil.

4. GENERAL:
   (i) Growth was good in the earlier stages. Later the growth was checked for want of moisture in the soil. Poor patches in all the plots due to death of plants by whithering was observed. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1947-1951 (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 190.7 lb./ac.
   (ii) 50.7 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. Yield</th>
<th>Treatment</th>
<th>Av. Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>200.4</td>
<td>6.</td>
<td>192.0</td>
</tr>
<tr>
<td>2.</td>
<td>204.0</td>
<td>7.</td>
<td>198.0</td>
</tr>
<tr>
<td>3.</td>
<td>199.2</td>
<td>8.</td>
<td>178.8</td>
</tr>
<tr>
<td>4.</td>
<td>198.6</td>
<td>9.</td>
<td>151.8</td>
</tr>
<tr>
<td>5.</td>
<td>193.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td>20.64 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Crop: Wheat.

Ref: M.P. 51(32).

Site: Adhartal Farm, Jabalpore.

Type ‘M’.

Object: To see the residual effect of T.C. on Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) Kabar (heavy soil). (b) Refer soil analysis, Jabalpore. (iii) 13, 14,11.1951. (iv) (a) Bakharing. (b) to (e) N.A. (v) Nil. (vi) A.O. 90 (medium). (vii) N.A. (viii) N.A. (ix) N.A. (x) 12, 14,4.1952.

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb./ac. of N as T.C.
   3. 40 lb./ac. of N as T.C.
   4. 20 lb./ac. of N as F.Y.M.
   5. 40 lb./ac. of N as F.Y.M.
   Treatments applied to previous crop wheat.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 80'x19'. (b) 66'x16'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Growth was good in the earlier stages. Later the growth was checked for want of moisture in the soil. Poor patches in all the plots due to death of plants by whithering was observed. (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1947 to 1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) The season was most unfavourable for the crop. Yield of wheat is too poor. (vii) Nil.
5. RESULTS:
   (i) 148.3 lb./ac.
   (ii) 37.32 lb./ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>114.1</td>
<td>6.</td>
<td>173.7</td>
</tr>
<tr>
<td>2.</td>
<td>143.7</td>
<td>7.</td>
<td>185.8</td>
</tr>
<tr>
<td>3.</td>
<td>159.2</td>
<td>8.</td>
<td>129.6</td>
</tr>
<tr>
<td>4.</td>
<td>139.1</td>
<td>9.</td>
<td>125.4</td>
</tr>
<tr>
<td>5.</td>
<td>164.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 15.24 lb./ac.

Crop :- Wheat (Rabi).
Site :- Adhartal Farm, Jabalpore.

Ref :- M.P. 52(25).
Type :- 'M'.

Object :- To study the comparative residual effect of different manures and fertilisers on Wheat.

1. BASEAL CONDITIONS:
   (i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) Kabar. (b) Refer soil analysis, Jabalpore. (iii) 20.3.1953.

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb./ac. of N as T.C.
   3. 40 lb./ac. of N as T.C.
   4. 20 lb./ac. of N as F.Y.M.
   5. 40 lb./ac. of N as F.Y.M.

Treatments applied to wheat crop during 1951-52.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 1/33 ac. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1949—N.A. (b) and (c) N.A. (v) 's' and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 136.51 lb./ac.
   (ii) 17.68 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>119.6</td>
<td>6.</td>
<td>149.7</td>
</tr>
<tr>
<td>2.</td>
<td>125.4</td>
<td>7.</td>
<td>157.1</td>
</tr>
<tr>
<td>3.</td>
<td>157.6</td>
<td>8.</td>
<td>112.2</td>
</tr>
<tr>
<td>4.</td>
<td>127.9</td>
<td>9.</td>
<td>121.3</td>
</tr>
<tr>
<td>5.</td>
<td>157.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 7.20 lb./ac.

Crop :- Wheat.
Site :- Adhartal Farm, Jabalpore.

Ref :- M.P. 51(24).
Type :- 'M'.

Object :- To see the residual effect of manures applied to gram on Wheat.

1. BASEAL CONDITIONS:
   (i) (a) N.A. (b) Gram. (c) As per treatments. (ii) (a) Kabar. (b) Refer soil analysis, Jabalpore. (iii) 24.10.1951.
   (iv) (a) Bakharing. (b) to (c) N.A. (v) Nil. (vi) to (ix) N.A. (x) 9.4.1952.
2. TREATMENTS:

5 doses of P₂O₅ as Super: P₀ = 0, P₁ = 15, P₂ = 20, P₃ = 25 and P₄ = 30 lb./ac.
Manures applied to gram crop grown in previous year.

3. DESIGN:

(i) R.B.D.  (ii) (a) S.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 66' x 16'.  (v) Nil.  (vi) Yes.

4. GENERAL:

(i) Poor plants withered due to lack of moisture in the soil.  (ii) N.A.  (iii) Grain and straw yield.  (iv) 1951—N.A.  (b) N.A.  (c) N.A.  (v) (a) N.A.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 265.2 lb./ac.
(ii) 165.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>213.7</td>
</tr>
<tr>
<td>P₁</td>
<td>250.2</td>
</tr>
<tr>
<td>P₂</td>
<td>278.6</td>
</tr>
<tr>
<td>P₃</td>
<td>269.9</td>
</tr>
<tr>
<td>P₄</td>
<td>307.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>—53.0 lb./ac.</td>
</tr>
</tbody>
</table>


Site: Adhartal Farm, Jabalpore.  Type: 'M'.

Object: To study the residual effect of manures applied to gram on Wheat.

1. BASAL CONDITIONS:

(i) (a) N.A.  (b) Gram.  (c) As per treatments.  (ii) (a) Kamer.  (b) Refer soil analysis, Jabalpore.  (iii) 23.10.1952.  (iv) (a) and (b) N.A.  (c) 80 lb./ac.  (d) and (e) N.A.  (f) N.A.  (g) A.O. 93 (medium).  (h) to (k) N.A.  (x) 3.4.1953.

2. TREATMENTS:

5 doses of P₂O₅ as Super: P₀ = 0, P₁ = 15, P₂ = 20, P₃ = 25 and P₄ = 30 lb. ac.
Manures applied to previous crop Gram.

3. DESIGN:

(i) R.B.D.  (ii) (a) S.  (b) N.A.  (iii) 4.  (iv) (a) and (b) 66' x 16'.  (v) Nil.  (vi) Yes.

4. GENERAL:

(i) Poor.  (ii) N.A.  (iii) Grain and straw yield.  (iv) (a) 1951—N.A.  (b) N.A.  (c) N.A.  (v) (a) and (b) N.A.  (vi) Crop suffered for want of adequate moisture in the soil.

5. RESULTS:

(i) 214.9 lb./ac.
(ii) 20.0 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>193.1</td>
</tr>
<tr>
<td>P₁</td>
<td>205.0</td>
</tr>
<tr>
<td>P₂</td>
<td>202.5</td>
</tr>
<tr>
<td>P₃</td>
<td>226.9</td>
</tr>
<tr>
<td>P₄</td>
<td>246.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>—10.0 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :-Wheat (Rabi).
Site :-Adhartal Farm, Jabalpore.

Object :-To study the effect of cotton seedcake as compared to F.Y.M. G.N.C. and A/S on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Kabar (heavy soil). (b) Refer soil analysis, Jabalpore. (iii) 23.10.1951. (iv) (a) Bakharing. (b) to (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) N.A. (viii) Weeding. (ix) N.A. (x) 20.3.1952.

2. TREATMENTS:
   1. Control.
   2. 20 lb./ac. of N as decorticated cotton seed cake.
   3. 20 lb./ac. of N as undecorticated cotton seed cake.
   4. 20 lb./ac. of N as A/S.
   5. 20 lb./ac. of N as G.N.C.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 1/40 ac. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) In the earlier stage the crop growth was good. But later the crop became poor due to withering for want of moisture in the soil. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable for the crop. (vii) Nil.

5. RESULTS:
   (i) 267.5 lb./ac.
   (ii) 57.36 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment          Av. yield
   1.                 194.9
   2.                 237.8
   3.                 240.8
   4.                 378.9
   5.                 285.0
   S.E./mean         = 25.60 lb./ac.

Crop :-Wheat (Rabi).
Site :-Adhartal Farm, Jabalpore.

Object :-To study the effect of cotton cake in comparison with other manures and fertilisers on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Kabar. (b) Refer soil analysis, Jabalpore. (iii) 30.10.1952. (iv) (a) and (b) N.A. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) to (ix) N.A. (x) 31.3.1953.

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb./ac. of N as decorticated cotton cake.
   3. 20 lb./ac. of N as undecorticated cotton cake.
   4. 20 lb./ac. of N as A/S.
   5. 20 lb./ac. of N as G.N.C.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 66'X16'. (b) 1/80 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Germination not satisfactory Crop was poor in some plots. Crop withered due to shortage of moisture in the soil. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted in 1953 was vitiated.
5. RESULTS:

(i) 275.6 lb./ac.
(ii) 30.72 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>275.8</td>
</tr>
<tr>
<td>2.</td>
<td>323.9</td>
</tr>
<tr>
<td>3.</td>
<td>275.5</td>
</tr>
<tr>
<td>4.</td>
<td>269.9</td>
</tr>
<tr>
<td>5.</td>
<td>336.0</td>
</tr>
</tbody>
</table>
S.E./mean = 13.68 lb./ac.

5. RESULTS:

(i) 657.1 lb./ac.
(ii) 84.80 lb./ac.
(iii) N effect is highly significant. P effect is significant while interaction N x P is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Pa</th>
<th>Pb</th>
<th>Pc</th>
<th>Pd</th>
<th>Pe</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>695.5</td>
<td>719.4</td>
<td>657.1</td>
<td>695.5</td>
<td>719.4</td>
<td>657.1</td>
</tr>
</tbody>
</table>
S.E. of marginal mean of N = 21.6 lb./ac.
S.E. of marginal mean of P = 26.3 lb./ac.
S.E. of body of table = 48.8 lb./ac.

Crop :- Wheat.
Site :- Adhartal Farm, Jabalpore.

Object :- To determine the dosage and ratio of N and P on Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Kabar. (b) Refer soil analysis, Jabalpore. (iii) 24.10.1951. (iv) (a) Bakharing. (b) to (e) N.A. (vi) Nil. (vii) A.O. 90 (medium). (viii) Unirrigated. (ix) Nil. (x) 9.4.1952.

2. TREATMENTS:

All combinations of (1) and (2)
(1) 5 doses of P₂O₅ as Super : P₀=0, P₁=15, P₂=30, P₃=45 and P₄=60 lb./ac.
(2) 3 doses of N as A/S : N₀=0, N₁=15 and N₂=30 lb./ac.

3. DESIGN:

(i) 3 x 5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 3 x 16''. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Good in the beginning. The crop in general suffered by whithering due to lack of moisture in the soil.
(ii) Nil. (iii) Grain and straw yield. (iv) (a) 1951—1956. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Season was most unfavourable for the crop. (vii) Nil.

5. RESULTS:

(i) 657.1 lb./ac.
(ii) 84.80 lb./ac.
(iii) N effect is highly significant. P effect is significant while interaction N x P is not significant.
(iv) Av. yield of grain in lb./ac.

Crop :- Wheat.
Site :- Adhartal Farm, Jabalpore.

Object :- To determine the dosage and ratio of N and P on Wheat.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) As per treatments. (c) N.A. (ii) (a) Kabar. (b) Refer soil analysis, Jabalpore. (iii) 24.10.1952. (iv) (a) and (b) N.A. (c) 80 lb./ac. (d) N.A. (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) to (ix) N.A. (x) 30.1.1953.
2. TREATMENTS:
All combinations of (1) and (2)
(1) 5 doses of P2O5 as Super: P0=0, P1=15, P2=30, P3=45 and P4=60 lb/ac.
(2) 3 doses of N as A/S: N0=0, N1=15 and N2=30 lb/ac.

3. DESIGN:
(i) 3 x 5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 33" x 16". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1951-1956. (b) Yes. (c) N.A. (v) (a) and (b)
N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 319.6 lb/ac.
(ii) 35.44 lb/ac.
(iii) N and P effects are highly significant while interaction is not significant.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>218.2</td>
<td>244.8</td>
<td>269.9</td>
<td>275.0</td>
<td>309.9</td>
<td>263.6</td>
</tr>
<tr>
<td>N1</td>
<td>256.6</td>
<td>313.4</td>
<td>324.8</td>
<td>343.5</td>
<td>351.8</td>
<td>318.0</td>
</tr>
<tr>
<td>N2</td>
<td>295.0</td>
<td>328.3</td>
<td>386.4</td>
<td>399.8</td>
<td>476.6</td>
<td>377.2</td>
</tr>
</tbody>
</table>

Mean 256.6 295.5 327.1 339.4 379.4 319.6

S.E. of marginal mean of N = 9.12 lb/ac.
S.E. of marginal mean of P = 11.81 lb/ac.
S.E. of body of table = 20.40 lb/ac.

Crop :- Wheat
Site :- Adhartal Farm, Jabalpore.
Ref :- M. P. 53(61)
Type :- 'M'.

Object — To determine the dose and ratio of N and P on wheat.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) Kabar 2. Refer soil analysis, Jabalpore. (iii) 28.10.53.
(iv) (a) Bakhering. (b) N.A. (c) 80 lb/ac. (d) and (e) N.A. (v) N.A. (vi) A.O.90 (medium). (vii) Unirrigated
(viii) N.A. (a) 0.98 (c) 23.3.54.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 5 doses of P2O5 as Super: P0=0, P1=15, P2=30, P3=45 and P4=60 lb/ac.
(2) 3 doses of N as A/S: N0=0, N1=15 and N2=30 lb/ac.

3. DESIGN:
(i) 3 x 5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 33" x 16"'. (v) N.A. (vi) Yes.

6. GENERAL:
(i) Poor yield. (ii) N.A. (iii) Weight of grain and straw. (iv) (a) 1951 to 1956. (b) Yes. (c) N.A. (v)
(a) Powarkheda. (b) N.A. (vi) and (vii) Nil.

RESULTS:
(i) 143.9 lb/ac.
(ii) 73.50 lb/ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>104.8</td>
<td>178.2</td>
<td>143.2</td>
<td>145.1</td>
<td>138.4</td>
<td>141.9</td>
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<tr>
<td>N₁</td>
<td>74.9</td>
<td>193.1</td>
<td>181.6</td>
<td>156.6</td>
<td>123.2</td>
<td>145.9</td>
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<tr>
<td>N₂</td>
<td>53.1</td>
<td>136.6</td>
<td>188.0</td>
<td>149.9</td>
<td>191.5</td>
<td>143.8</td>
</tr>
<tr>
<td>Mean</td>
<td>77.6</td>
<td>169.3</td>
<td>170.9</td>
<td>150.5</td>
<td>151.0</td>
<td>143.8</td>
</tr>
</tbody>
</table>

S.E. of P marginal mean = 24.70 lb./ac.
S.E. of N marginal mean = 18.98 lb./ac.
S.E. of body of table = 42.43 lb./ac.

Crop: Wheat
Site: Adhartal Farm, Jabalpore.

Object: To study the effect of C/N in comparison with A/S and in combination with lime.

1. Basal Conditions:
   (i) (a) to (c) N.A. (ii) Kabar. (b) Refer soil analysis, Jabalpore. (iii) 5.11.1952. (iv) (a) and (b) N.A. (c) 80 lb./ac., (d) and (e) N.A. (v) A.O. 50 (medium) (vi) to (ix) N.A. (x) 2.4.1953.

2. Treatments:
   All combinations of (1) and (2):
   (1) 2 doses of Lime: L₀ = 0 and L₁ = 200 lb./ac.
   (2) 5 doses of N: N₀ = 0, N₁ = 20 lb./ac. of N as A/S, N₂ = 40 lb./ac. of N as C/N, N₃ = 20 lb./ac. of N as C/N, N₄ = 40 lb./ac. of N as C/N.

3. Design:
   (i) 5 x 2 Fact. in R. B. D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 6 x 16/. (v) Nil. (vi) Yea.

4. General:
   (i) Normal (few plants withered for want of moisture). (ii) N.A. (iii) grain and straw yield (iv) 1952 to 1953. (b) and (c) N.A. (v) (a), (b) N.A. (vi) Nil. (vii) Experiment conducted in 1953 vitiated.

5. Results:
   (i) 395.6 lb./ac.
   (ii) 33.40 lb./ac.
   (iii) L, N effects and interaction L x N all are highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>L₀</td>
<td>365.6</td>
<td>361.9</td>
<td>371.8</td>
<td>357.7</td>
<td>378.5</td>
<td>367.1</td>
</tr>
<tr>
<td>L₁</td>
<td>329.9</td>
<td>392.9</td>
<td>421.2</td>
<td>395.4</td>
<td>435.3</td>
<td>395.6</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of L = 16.0 lb./ac.
S.E. of marginal mean of N = 9.54 R. lb./ac.
S.E. of body of table = 14.60 lb./ac.
Crop : Wheat (Rabi).  
Site : Institute of Plant Industry, Indore.  

Object : To find the suitable combination of N and P for Wheat.

1. BASAL CONDITIONS :
   (i) (a) N.A.  (b) Sann.  (c) Nil.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) N.A.  (iv) (a) Bakkuring.  (b) and (c) N.A.  (d) 14'.  (e) N.A.  (v) Green manured by Sann.  (vi) Malvi EKD.  (vii) N.A.  (viii) Down, weeding etc.  (ix) and (x) N.A.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 levels of N as G.N.C. : N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
   (2) 3 levels of P₂₀₅ as Super : P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.

3. DESIGN :
   (i) 3 x 3 F act. in R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) 14' x 35'.  (b) 10' x 30'/4'.  (v) 2 rows on both the sides and 2 feet of each row at both ends.  (vi) Yes.

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

5. RESULTS :
   (i) 535.4 lb/ac.
   (ii) 87.1 lb/ac.
   (iii) N effect is significant, P effect is highly significant, while interaction N x P is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>427.8</td>
<td>427.8</td>
<td>523.6</td>
<td>459.7</td>
</tr>
<tr>
<td>481.7</td>
<td>604.4</td>
<td>573.0</td>
<td>553.0</td>
</tr>
<tr>
<td>550.5</td>
<td>592.4</td>
<td>637.3</td>
<td>593.4</td>
</tr>
<tr>
<td>Mean</td>
<td>486.7</td>
<td>541.5</td>
<td>578.0</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 20.6 lb/ac,
S.E. of body of table = 35.5 lb/ac,

Crop : Wheat.  
Site : Institute of Plant Industry, Indore.  

Object : To study the response of graded doses of N singly and in combination with different doses of P₂₀₅.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) 3.11.1949.  (iv) (a) to (c) N.A.  (d) 14'.  (e) N.A.  (v) Malvi EKD (N.A.)  (vi) N.A.  (vii) Weeding.  (ix) and (x) N.A.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S : N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
   (2) 3 levels of P₂₀₅ as Super : P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.

3. DESIGN :
   (i) 3 x 3 F act. in R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 10' x 23'/4'.  (v) N.A.  (vi) Yes.

4. GENERAL :
   (i) N.A.  (ii) N.A.  (iii) Grain and fodder yield.  (iv) (a) to (c) N.A.  (v) (a) and (b) N.A.  (vi) Nil.  (vii) The field in which the experiment is laid out was water logged.
5. RESULTS:

(i) 529.2 lb./ac.
(ii) 128.95 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>444.3</td>
<td>549.0</td>
<td>568.4</td>
<td>520.6</td>
</tr>
<tr>
<td>P₁</td>
<td>533.5</td>
<td>551.0</td>
<td>521.9</td>
<td>535.4</td>
</tr>
<tr>
<td>P₂</td>
<td>552.9</td>
<td>531.6</td>
<td>510.2</td>
<td>531.6</td>
</tr>
<tr>
<td>Mean</td>
<td>510.2</td>
<td>543.8</td>
<td>533.5</td>
<td>529.2</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 30.34 lb./ac.
S.E. of body of table = 52.63 lb./ac.

Crop: Wheat.
Site: Institute of Plant Industry, Indore.
Ref: M.P. 50(5).
Type: 'M'.

Object: To study the residual response of N and P₂O₅ singly and in combination on the yield of Wheat crop.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A.  (ii) (a) Black cotton soil. (b) N.A.  (iii) 8.10.1950. (iv) (a) N.A. (b) N.A. (v) N.A. (vi) May 1951. (vii) N.A. (viii) N.A. (ix) 14.3 1951.

2. TREATMENTS:

All combinations of (1) and (2)
(1) 2 levels of N as A/S: N₀ = 0 and N₁ = 20 lb./ac.
(2) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 20 lb./ac.

3. DESIGN:

(i) 2 x 2 Fact. in R.B.D.  (ii) 4. (b) N.A.  (iii) 6. (iv) 35°-8° > 15°. (b) 30°-8° x 10° 2.5’ around. (vi) Yes.

4. GENERAL:

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

5. RESULTS:

(i) 384.50 lb./ac.
(ii) 34.50 lb./ac.
(iii) All the effects are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
<td>P₀</td>
<td>316.5</td>
<td>396.4</td>
<td>356.4</td>
</tr>
<tr>
<td>P₁</td>
<td>417.1</td>
<td>408.2</td>
<td>412.6</td>
</tr>
<tr>
<td>Mean</td>
<td>366.8</td>
<td>402.3</td>
<td>384.2</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 9.96 lb./ac.
S.E. of body of table = 14.08 lb./ac.
Crop : Wheat.  
Site : Institute of Plant Industry, Indore.  
Object : To study the effect of application of N and P applied alone and in combination on unirrigated Wheat.

5. BASAL CONDITIONS:
(i) (a) No. (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.10.1952. (iv) (a) and (b) N.A. (c) 60 lb./ac. (d) Rows 14" apart. (e) N.A. (v) N.A. (vi) E.69. (vii) Unirrigated. (viii) N.A. (ix) 1.2'. (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N as A/S : N₀=0, N₁=10 and N₂=20 lb./ac.
(2) 5 levels of P₂O₅ as Super : P₀=0, P₁=10, P₂=20, P₃=30 and P₄=40 lb./ac.

3. DESIGN:
(i) 3x5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 40'x16'-4". (b) 35'x11'-8". (v) 2.5' around. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) Slightly damaged by rats (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 188.7 lb./ac.
(ii) 155.2 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>201.1</td>
<td>192.2</td>
<td>187.8</td>
<td>198.2</td>
</tr>
<tr>
<td>N₁</td>
<td>177.6</td>
<td>204.2</td>
<td>207.1</td>
<td>192.2</td>
<td>140.5</td>
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<tr>
<td>N₂</td>
<td>207.1</td>
<td>181.1</td>
<td>183.4</td>
<td>195.4</td>
<td>199.8</td>
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<tr>
<td>Mean</td>
<td>182.5</td>
<td>195.5</td>
<td>194.2</td>
<td>191.8</td>
<td>179.5</td>
</tr>
</tbody>
</table>

S.E. of P marginal means = 51.73 lb./ac.
S.E. of N marginal means = 40.10 lb./ac.
S.E. of body of table = 89.60 lb./ac.
4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 467 lb./ac.
(ii) 85.73 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

\[
\begin{array}{cccccc}
 & P_0 & P_1 & P_2 & P_3 & P_4 & \text{Mean} \\
N_0 & 467 & 452 & 496 & 467 & 508 & 478 \\
N_1 & 501 & 544 & 459 & 435 & 486 & 485 \\
N_2 & 430 & 471 & 450 & 418 & 423 & 428 \\
\text{Mean} & 466 & 469 & 468 & 440 & 472 & 467 \\
\end{array}
\]

S.E. of marginal mean of N = -19.15 lb./ac.
S.E. of marginal mean of P = -24.75 lb./ac.
S.E. of body of table = -42.8:(lb./ac.

Crop :- Wheat.
Site :- Institute of Plant Industry, Indore.
Object :- To find out the response of wheat to different doses of N and P in combination.

1. BASAL CONDITIONS:
(i) (a) No. (b) Maize. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.11.1953. (iv) (a) B. chardal twice. (b) Drilled. (c) to (e) N.A. (iv) (a) 50' Y 9' 4". (b) 5' x 4' 8'. (v) 2 rows on each side of 2' width. (vi) Yes.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N as A/S: N_0 = 0, N_1 = 15 and N_2 = 30 lb./ac.
(2) 5 levels of P_2O_{5} at Super: P_0 = 0, P_1 = 15, P_2 = 30, P_3 = 45, P_4 = 60 lb./ac.

3. DESIGN:
(i) 3 x 5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 4. (iv) (a) 50' x 9' 4". (b) 45' x 4' 8". (v) 2 rows on each side of 2' width. (vi) Yes.

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

5. RESULTS:
(i) 1826 lb./ac.
(ii) 207.94 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

\[
\begin{array}{cccccc}
 & P_0 & P_1 & P_2 & P_3 & P_4 & \text{Mean} \\
N_0 & 1656 & 1801 & 1597 & 1779 & 1643 & 1695 \\
N_1 & 2103 & 1691 & 1967 & 1750 & 1792 & 1861 \\
N_2 & 1986 & 1944 & 1886 & 1976 & 1824 & 1923 \\
\text{Mean} & 1915 & 1812 & 1817 & 1835 & 1753 & 1826 \\
\end{array}
\]

S.E. of marginal mean of N = 46.50 lb./ac.
S.E. of marginal mean of P = 60.03 lb./ac.
S.E. of body of table = 103.97 lb./ac.
Crop :- Wheat.  
Ref :- M. P. 48 (13).  
Type ‘M’

Object :- To find the response of Wheat to different combinations of N and P₂O₅.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  
(ii) (a) Black cotton soil (b) N.A. (c) 60 lb./ac.  
(iii) N.A.  
(iv) (a) Bakharing, (b) (c) N.A.  
(v) N.A.  
(vi) C. 591 (medium).  
(vii) N.A.  
(viii) Weeding and hoeing.  
(ix) N.A.  
(x) N.A.

2. TREATMENTS:
All combinations of (1) and (2).
1. 3 levels of N as G.N.C. : N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
2. 3 levels of P₂O₅ as Super : P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.

3. DESIGN:
(i) 3 x 3 Fact. in R.B.D.  
(ii) (a) 9. (b) N.A.  
(iii) 6.  
(iv) (a) N.A. (b) 10’ x 30’4”. (v) N.A.  
(vi) Yes.

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

5. RESULTS:
(i) 925.4 lb./ac.  
(ii) 140.6 lb./ac.
(iii) Both N and P effects are significant while interaction N x P is not significant.  
(iv) Av. yield of grain in lb./ac.

<table>
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<th>N₂</th>
<th>Mean</th>
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<tr>
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<td>993.3</td>
<td>1119.0</td>
<td>1013.3</td>
</tr>
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</table>

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S.E. of any marginal mean = 33.2 lb./ac.  
S.E. of the body of table = 57.4 lb./ac.

Crop :- Wheat  
Ref :- M. P. 49 (23).  
Type :- ‘M’

Object :- To study the response of Wheat to the application of N and P singly and in combination.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  
(ii) (a) Black cotton soil (b) N.A. (c) 30.11.1949.  
(iii) N.A. (d) 14” (e) N.A. (f) N.A. (vi) C. 591.  
(vii) N.A. (viii) Weeding (ix) N.A. (x) N.A.

2. TREATMENTS:
All combinations of and (1) and (2).
1. 3 levels N as A/S : N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.  
2. 3 levels of P₂O₅ as Super : P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.

3. DESIGN:
(i) 3 x 3 Fact in R.B.D.  
(ii) (a) 9. (b) N.A. (iii) 6.  
(iv) (a) 35’ x 14”. (b) 30’4” x 10’. (v) Two rows on both the sides and 2’ of each row at both ends.  
(vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) grain and fodder yield.  
(iv) (a) to (c) N.A. (v) (a), (b) N.A. (vi) Nil. (vii) Nil.
5. RESULTS:
(i) 857.7 lb./ac.
(ii) 92.3 lb./ac.
(iii) N and P effects are highly significant, while interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<th>N₂</th>
<th>Mean</th>
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<td>897.0</td>
<td>904.5</td>
<td>884.5</td>
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<td>858.0</td>
<td>871.5</td>
<td>934.5</td>
<td>883.0</td>
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<tr>
<td>Mean</td>
<td>801.0</td>
<td>876.0</td>
<td>896.0</td>
<td>857.7</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 21.7 lb./ac.
S.E. of body of table = 37.7 lb./ac.

Crop: Wheat.
Site: Institute of Plant Industry, Indore.
Ref: M. P. 50(4).
Type: 'M'.

Object: To study the response of N and P singly and in combination on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) 16.10.1950.  (v) (a) to (c) N.A.  (v) N.A.  (vi) C-591.  (vii) Unirrigated.  (viii) N.A.  (x) 15.3.1951.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of N as A/S: N₀ = 0 and N₁ = 20 lb./ac.
(2) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 20 lb./ac.

3. DESIGN:
(i) 2 x 2 Fact. in R.B.D.  (ii) 4.  (b) N.A.  (iii) 6.  (iv) (a) 35°S × 15°.  (b) 35°S × 19°.  (c) 2° around.  (vi) Yes.

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

5. RESULTS:
(i) 508.7 lb./ac.
(ii) 68.99 lb./ac.
(iii) N effect alone is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<th>N₁</th>
<th>Mean</th>
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<td>536.1</td>
<td>522.8</td>
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<td>P₁</td>
<td>485.1</td>
<td>544.2</td>
<td>514.6</td>
</tr>
<tr>
<td>Mean</td>
<td>457.3</td>
<td>550.2</td>
<td>502.7</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 20.24 lb./ac.
S.E. of body of table = 23.16 lb./ac.
Crop: Wheat (Rabi).
Site: Institute of Plant Industry, Indore.

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

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (iii) 2.10.1951. (iv) (a) Bakharing. (b) N.A. (c) 60 lb./ac. (d) 14". (e) N.A. (v) Nil. (vi) C.591 (medium). (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N₀ =0, N₁ =15 and N₂ =30 lb./ac.
   (2) 5 levels of P₂O₅ as Super: P₀ =0, P₁ =15, P₂ =30, P₃ =45 and P₄ =60 lb./ac.

3. DESIGN:
   (i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 15′×40′. (b) 9′×4′×35′. (v) Two rows on both sides and 21′ of each row at both ends. (vi) Yes.

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

5. RESULTS:
   (i) 331.3 lb./ac.
   (ii) 65.78 lb./ac.
   (iii) Only N effect is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>Mean</th>
</tr>
</thead>
</table>
   N₀ | 336.2 | 311.2 | 339.0 | 252.9 | 355.7 | 319.9 |
   N₁ | 297.4 | 200.1 | 322.4 | 352.9 | 344.6 | 303.5 |
   N₂ | 364.0 | 344.6 | 380.7 | 383.5 | 383.5 | 371.3 |
   Mean | 352.6 | 285.3 | 347.4 | 329.8 | 361.3 | 331.3 |

   S.E. of marginal mean of N =17.00 lb./ac.
   S.E. of marginal mean of P =21.93 lb./ac.
   S.E. of body of tafte =37.98 lb./ac.

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Crop: Wheat (Rabi).
Site: Institute of Plant Industry, Indore.

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

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Cotton. (c) Sann as G.M. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Bakharing. (b) N.A. (c) 60 lb./ac. (d) and (e) N.A. (v) N.A. (vi) C. 591 (medium). (vii) Irrigated. (viii) Weeding (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N₀ =0, N₁ =15 and N₂ =30 lb./ac.
   (2) 5 levels of P₂O₅ as Super: P₀ =0, P₁ =15, P₂ =30, P₃ =45 and P₄ =60 lb./ac.

3. DESIGN:
   (i) 3×5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 15′×40′. (b) 9′×4′×35′. (v) Two rows on both sides and 21′ of each row at both ends. (vi) Yes.

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

(i) 1113 lb./ac.
(ii) 343.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
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<td>907</td>
<td>1093</td>
<td>1241</td>
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<tr>
<td>N₂</td>
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<td>1358</td>
<td>947</td>
<td>967</td>
<td>1092</td>
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</table>

Mean: 1226 1062 1159 1051

S.E. of marginal mean of N = 88.76 lb./ac.
S.E. of marginal mean of P = 114.60 lb./ac.
S.E. of body of table = 198.5 lb./ac.

Crop: Wheat.
Site: Institute of Plant Industry, Indore.
Object: To study the effect of different green manuring crops on the yield of Wheat and their residual effect on Jowar.

1. BASAL CONDITIONS:
(i) No. (b) Nil. (c) Nil. (d) Black cotton soil. (e) N.A. (f) 6 to 8.10.1952. (g) C. 591 (medium). (h) Unirrigated. (i) N.A. (j) N.A. (k) 7.6.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 30 lb./ac.
(2) 11 kinds of G.M.: G₀ = 0 (no G.M.), G₁ = Daincha, G₂ = Moong, G₃ = Mung, G₄ = Sannhemp, G₅ = Urid, G₆ = Cowpea, G₇ = Soyabeal, G₈ = Sanbaria, G₉ = Guara and G₁₀ = Moong (local).

3. DESIGN:
(i) 2 x 11 Fact. in R.B.D. (ii) N.A. (iii) 4. (iv) (a) 60°x18°. (b) 60°x14°. (v) 2° breadthwise. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 - 53. (b) and (c) No. (d) and (e) No. (f) and (g) Nil.

5. RESULTS:
(i) 621.0 lb./ac.
(ii) 105.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th>G₀</th>
<th>G₁</th>
<th>G₂</th>
<th>G₃</th>
<th>G₄</th>
<th>G₅</th>
<th>G₆</th>
<th>G₇</th>
<th>G₈</th>
<th>G₉</th>
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<tr>
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<td>611.0</td>
<td>611.0</td>
<td>575.2</td>
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<td>705.2</td>
<td>624.0</td>
<td>546.0</td>
<td>666.1</td>
<td>699.5</td>
</tr>
</tbody>
</table>

Mean: 568.7 628.8 615.8 559.0 591.4 653.7 611.8 630.5 617.5 649.1 633.3 621.0

S.E. of marginal mean of P = 5.50 lb./ac.
S.E. of marginal mean of G = 7.37 lb./ac.
S.E. of body of table = 15.10 lb./ac.
Crop := Wheat. 
Ref. := M.P. 53(15). 
Site := Institute of Plant Industry, Indore. 
Type := 'M'. 

Object := To find the most suitable legume G.M. for Wheat under rainfed conditions.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Black cotton scil. (b) N.A.  (iii) 20.11.1953.  (iv) (a) 3 bakharing  (b) Drilled.  (c) 60 lb./ac.  (d) Rows 14* apart. (e) N.A.  (v) No.  (vi) E. 69. (vii) Unirrigated. (viii) N.A. (ix) 2.57*.  (x) 1.3.1954.

2. TREATMENTS:
   Main-plot treatments :
   2 times of application of P₂O₅ : T₁ = 5 weeks and T₂ = 7 weeks.
   Sub-plot treatments:
   All combinations of (1) and (2) :
   (1) 2 levels of P₂O₅ as Super : P₀ = 0 and P₁ = 30 lb./ac.
   (2) 10 kinds of G.M. : G₀ = No G.M., G₁ = Dhaincha, G₂ = Moong No. 1, G₃ = Moong of Sindhkhera, G₄ = Sannhemp, G₅ = Udid, G₆ = Cowpea, G₇ = Soyabean, G₈ = Guar and G₉ = Moong local.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block and 20 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 85' × 11'8".  (b) 80' × 7'. (v) 2' rows on each side and 2' on each end.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) Nil. (iii) Grain yield.  (iv) (a) 1952 to 1953. (b) N.A.  (v) (a) and (b) No. (vi) and (vii) Nil.

5. RESULTS:
   (i) 679 lb./ac.
   (ii) 238.8 lb./ac.
   (b) 112.7 lb./ac.
   (iii) Interaction P × T alone is significant.
   (iv) Av. yield of grain in lb./ac.

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<th>G₁</th>
<th>G₂</th>
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<td>647</td>
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</table>

S.E. of difference of two
1. T marginal means = 37.8 lb./ac.
2. P marginal means = 17.8 lb./ac.
3. G marginal means = 39.8 lb./ac.
4. P means at the same level of T = 25.2 lb./ac.
5. T means at the same level of P = 41.8 lb./ac.
6. G means at the same level of T = 56.4 lb./ac.
7. T means at the same level of G = 65.4 lb./ac.
8. means in the body of P × G table = 56.4 lb./ac.
Crop: Wheat.
Site: Institute of Plant Industry, Indore.
Ref: M.P. 53(10).
Type: 'M'.

Object: To study the response due to different levels of N in combination with mulching practices.

1. BASAL CONDITIONS:
   (i) (a) No. (b) to (c) N.A. (ii) (a) Black cotton silt (b) N.A. (iii) 22.1.1955. (iv) (a) Blackhead cane.
   (b) Drilled. (c) 60 lb./ac. (d) II'. (e) N.A. (v) Nil. (vi) E. 68 (vii) N.A. (viii) 2.37'. (v) 23.5.1954.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 3 levels of N: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
   (2) 2 sources of N: S₁ = A/S and S₂ = C/N.
   (3) 2 levels of mulching: M₀ = No mulching and M₁ = Mulching.

3. DESIGN:
   (i) 2 x 2 x 3 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 40 x 4. (v) 33 x 9. (vi) 2 xalc.and.
   (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) No. (v) (a) No. (b) N.A. (vi) 1 and (vii) Nil.

5. RESULTS:
   (i) 600 lb./ac.
   (ii) 53.3 lb./ac.
   (iii) Only M effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
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<td>—</td>
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S.E. of N marginal means = 20.8 lb./ac.
S.E. of M marginal means = 17.0 lb./ac.
S.E. of S marginal mean in S x N table = 20.8 lb./ac.
S.E. of S marginal mean in S x M table = 17.0 lb./ac.
S.E. of body of M x N table = 23.5 lb./ac.
S.E. of body of M x S table = 21.0 lb./ac.
S.E. of body of S x N table = 29.3 lb./ac.
3. DESIGN:
(i) 2x4 Fact. in R.B.D. (ii) 8. (b) N.A. (iii) 6. (iv) (a) 60'x18'-6", (b) 55'x15', (v) 2.5'x1'-10". (vi) Yst.

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

5. RESULTS:
(i) 380.2 lb./ac.
(ii) 65.88 lb./ac.
(iii) Interaction P x G alone is significant.
(iv) Av. yield of grain in lb./ac.

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S.E. of marginal mean of P = 13.44 lb./ac.
S.E. of marginal mean of G = 19.02 lb./ac.
S.E. of body of table = 26.89 lb./ac.

Crop: Wheat (Rabi).
Site: Institute of Plant Industry, Indore.
Object: To find out the effect of G.M. on Wheat.

Ref: M.P. 49(2).
Type: 'M'.

Object: To find out the effect of G.M. on Wheat.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) Bakharing. (b) and (c) N.A. (d) 14". (e) N.A. (v) to (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of P0,G: P0 = 0 and P1 = 40 lb./ac.
(2) 2 levels of G.M.: G0 = 0 (no G.M.) and G1 = Green manuring with sann (80 lb. of sann seed).

3. DESIGN:
(i) 2x2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 18'-5"x60'. (b) 14'x53'. (v) 2 rows on both sides and 2½ feet of each row. (vi) Yes.

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

5. RESULTS:
(i) 445.7 lb./ac.
(ii) 76.36 lb./ac.
(iii) Only G effect is significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
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<th>G1</th>
<th>Mean</th>
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<tr>
<td>Mean</td>
<td>403.7</td>
<td>487.7</td>
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</table>

S.E. of any marginal mean = 22.01 lb./ac.
S.E. of body of table = 31.11 lb./ac.
Crop: Wheat  
Site: Institute of Plant Industry, Indore.

Object: To study how the soaking of the seed in different nutrient solutions of varying concentrations and timings affect the two phases of plant life.

1. BASAL CONDITIONS:
   (i) (a) Nil, (b) N.A.
   (ii) 44. (b) N.A.
   (iii) Black cotton soil. (b) N.A.
   (iv) (a) 4 soaked twice. (b) N.A.
   (v) N.A. (c) 60 lb./ac.
   (viii) N.A. (ix) N.A. (x) 4.3.1953.

2. TREATMENTS:
   All combinations of (1), (2) and (3)+8 plots for sowing of dry seeds, D1 and extra treatments W1, W2, W3 and W4.
   (1) 4 soaking periods: S1=2, S2=4, S3=6 and S4=8 hours.
   (2) 2 chemicals of soaking: C1 = A/Sand C2 = S203.
   (3) 4 concentrations of molar solution: M1 = 0.25, M2 = 0.50, M3 = 0.75 and M4 = 1.00.
   Extra treatments are soaking of seeds in water: W1 = 2 hours, W2 = for 4 hours, W3 = 6 hours and W4 = 8 hours.

3. DESIGN:
   (i) R.B.D. (ii) 44. (b) N.A. (iii) 2.
   (iv) (a) 25' x 11'-3'. (b) 25' x 11'-8'. (v) 25' x 11'-10'. (vi) Yrs.
   (vii) Yrs.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1948 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A.
   (vi) and (vii) Nil.

5. RESULTS:
   (i) +30 lb./ac.
   (ii) 132.7 lb./ac.
   (iii) S effect and interaction S x C are significant. Other effects are not significant.
   (iv) Av. yield of grain in lb./ac.

   \[ \begin{array}{cccccc}
   & M_1 & M_2 & M_3 & M_4 & \text{Mean} \\
   S_1 & 414 & 485 & 444 & 531 & 468 \\
   S_2 & 454 & 403 & 493 & 500 & 473 \\
   S_3 & 434 & 322 & 337 & 362 & 364 \\
   S_4 & 362 & 225 & 342 & 496 & 356 \\
   \text{Mean} & 416 & 359 & 405 & 472 & 43  \\
   C_1 & 373 & 339 & 408 & 462 & 43  \\
   C_2 & 459 & 378 & 311 & 492 & 43  \\
   \end{array} \]

   S.E. of S or M marginal means 33.17 lb./ac.
   S.E. of C marginal means 32.49 lb./ac.
   S.E. of body of table S x C or M x C -46.92 lb./ac.
   S.E. of body of table S x M -66.35 lb./ac.
   S.E. of D1 mean -33.17 lb./ac.
   S.E. of any of W means 91.81 lb./ac.
Crop : - Wheat.
Site : - Institute of Plant Industry, Indore.

Ref : - M.P. 53(18).
Type : - 'M'.

Object : - To study the effect of soaking Wheat seeds in nutrient solutions of different concentrations for different periods of sowing.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 24.10.1953. (iv) (a) Bakhared thrice.
   (b) Drilled. (c) 60 lb./ac. (d) 14" apart. (e) N.A. (v) N.A. (vi) E.K. 69 (early). (vii) Unirrigated.
   (viii) N.A. (ix) 2.57". (x) 6.3.1954.

2. TREATMENTS:
   All combinations of (1), (2) and (3) + 3 extra treatments.
   (1) 2 soaking periods : S1=4 and S2=8 hours.
   (2) 2 soaking chemicals : C1=A/S and C2=Ammo. Phos.
   (3) 3 concentrations : M1=0.1, M2=0.2 and M3=0.3.
   3 extra treatment are : E1= Dry seed sown (4 plots), E2= soaked in water for 4 hours (2 plots) and E3= soaked in water for 8 hours (2 plots).

3. DESIGN:
   (i) R.B.D. (ii) (a) 20. (b) N.A. (iii) 4. (iv) (a) 50' X 11' 8". (b) 45' X 7". (v) 2' 6" X 2' 4". (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) No. (iii) Grain yield. (iv) (a) 1949 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A.
   (vii) No. (vii) Nil.

5. RESULTS:
   (i) 538 lb./ac.
   (ii) N.A.
   (iii) N.A.
   (iv) Av. yield of grain in lb./ac.

\[
\begin{array}{ccc|cc}
M_1 & M_2 & M_3 & Mean & S_1 & S_2 \\
\hline
C_1 & 559 & 578 & 538 & 558 & 558 & 558 \\
C_2 & 563 & 535 & 460 & 519 & 510 & 529 \\
Mean & 561 & 557 & 499 & 539 & & \\
S_1 & 559 & 525 & 578 & 534 & & \\
S_2 & 563 & 588 & 480 & 544 & & \\
\end{array}
\]

S.E.'s N.A.

Crop : - Wheat.
Site : - Govt. Experimental Farm, Powerkheda.

Ref : - M.P. 51(58).
Type : - 'M'.

Object : - To see the effect of application of F.Y.M. with and without A/S.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Clay loam (marshy). (b) Refer soil analysis, Powerkheda. (iii) 20.10.1951.
   (iv) (a) Bakharing. (c) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Hy. II-6 (medium). (vii) Unirrigated. (viii) N.A. (ix) 2.24". (x) N.A.

2. TREATMENTS:
   1. 10 C.L./ac. of F.Y.M.
   2. 10 C.L. of F.Y.M. + A/S at 5 lb./ac. of N.
3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) and (b) 16’ x 33’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (v) Yield is too poor. Unfavourable weather condition for the crop. (vii) Nil.

5. RESULTS:
   (i) 208.3 lb./ac.
   (ii) 54.74 lb./ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield | S.E./mean
   1. | 180.8 | 22.37 lb./ac.
   2. | 235.8 |

Crop: - Wheat.
Ref: - M.P. 53/38).
Site: - Govt. Experimental Farm, Powarkheda.
Type: - 'M'.

Object: - To study the effect of adding F.Y.M. alone and in combination with N’S on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Wheat. (c) 15 lb./ac. of N and 15 lb./ac. of P₂O₅ through fertilizer mixture. (ii) Clay loam (marly). (b) Refer soil analysis, Powarkheda. (iii) 4-11-1953. (iv) (a) Ploughed (b) Sown with novel mixture. (v) 80 lb./ac. (vi) (a) N.A. (vii) Nil. (vii) Nil. (vii) Nil. (v) 1.25”. (vi) 10-10.1954.

2. TREATMENTS:
   1. F.Y.M. alone at 10 C.L./ac.
   2. F.Y.M. at 10 C.L./ac. + 5 lb./ac. of N as S drilled with the seed.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 4. (iv) (a) and (b) 16’ x 33’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Nil. (ii) Nil. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 410.4 lb./ac.
   (ii) 55.60 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield | S.E./mean
   1. | 441.0 | 42.38 lb./ac.
   2. | 376.8 |

Crop: - Wheat.
Ref: - M.P. 53/55.
Site: - Govt. Exptl. Farm, Powarkheda.
Type: - 'N'.

Object: - To determine the dosage and ratio of N to P₂O₅ for Wheat under irrigated conditions.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Clay loam (Marly). (b) Refer soil analysis, Powarkheda. (iii) 20-31.10.1951. (iv) (a) Bakrham. (b) N.A. (c) 80 lb./ac. (d) 12”. (e) N.A. (v) Nil. (vi) Nil. (vii) Nil. (vii) Nil. (vii) Nil.
   (i) Irrigated. (vii) Nil. (ii) 2.24”. (iii) 25-4-1955.
2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N₀ = 0, N₁ = 30 and N₂ = 60 lb./ac.
   (2) 5 levels of P₂O₅ as Super: P₀ = 0, P₁ = 30, P₂ = 60, P₃ = 90 and P₄ = 120 lb./ac.

3. DESIGN:
   (i) 3 x 5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 18 ½' x 66'. (b) 16 ½' x 66'. (v) One row on both the sides. (vi) No.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1951—1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1066 lb./ac.
   (ii) 260.0 lb./ac.
   (iii) None of the effects is significant.

### Table

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S.E. of marginal mean of N = 47.4 lb./ac.
S.E. of marginal mean of P = 61.1 lb./ac.
S.E. of body of table = 105.9 lb./ac.

Ref:— M.P. 53(41). Type 1- 'M'.

Object:—To determine the effect of N and P applied alone and in combination.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam, (Mariyar). (b) Refer soil analysis, Powarkheda. (iii) 20.11.1953. (iv) (a) Bakkarings. (b) Sown with nari plough. (c) 80 lb./ac. (d) Lines 1' apart. (e) N.A. (v) Nil. (vi) Hy. 11. Improved (medium). (vii) Irrigated. (viii) Nil. (ix) 1.25'. (x) 21.4.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N₀ = 0, N₁ = 30 and N₂ = 60 lb./ac.
   (2) 5 levels of P₂O₅ as Super: P₀ = 0, P₁ = 30, P₂ = 60, P₃ = 90 and P₄ = 120 lb./ac.
   Both N and P₂O₅ drilled along with the seed.

3. DESIGN:
   (i) 3 x 5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 16½' x 33'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—1953. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1066 lb./ac.
   (ii) 260.0 lb./ac.
   (iii) None of the effects is significant.
Crop: Wheat.  
Ref: M.P. 51(54)  
Site: Govt. Exptl. Farm, Powarkheda.  
Type: M.P.  

Object: To determine the dosage and ratio of N to P for Wheat under irrigated conditions.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) a) Clay loam (marly arenic). b) Refer soil analysis, Powarkheda.  (iii) 18.9.1951.  
   (iv) (a) Bakharing. (b) Sown by harrow plough, (c) 80 lb./ac.  (d) 125. (e) N.A. (f) N.A. (g) A-1.5 (local).  (h) Irrigated.  (i) Nil.  (j) 24.  (k) N.A.

2. TREATMENTS:
   All combinations of (1) and (3)  
   (1) 3 levels of N as A/S: N0 = 0, N1 = 75, and N2 = 125 lb./ac.
   (2) 3 levels of P2O5 as Super: P0 = 0, P1 = 30, P2 = 60, P3 = 90 and P4 = 120 lb./ac.

3. DESIGN:
   (i) 3x5 Factorial in R.B.D.  (ii) (a) 15.  (b) N.A.  (iii) 3.  (iv) (a) 18'x66'. (b) 16'x66'.  (c) One row on both sides.  (vi) No.

4. GENERAL:
   (i) Good.  (ii) N.A.  (iii) Grain yield.  (iv) 'a' 1951 to 1953.  (b) No.  (c) N.A.  (v) (a) and (c) N.A.  
   (vi) and (vii) Nil.

5. RESULTS:
   (i) 1410 lb./ac.  
   (ii) 320.4 lb./ac.  
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<th>P2</th>
<th>P3</th>
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S.E. of marginal mean of N = 82.7 lb./ac.
S.E. of marginal mean of P = 106.8 lb./ac.
S.E. of body of table = 185.9 lb./ac.
Crop :- Wheat. Ref :- M.P. 52(40).
Site :- Govt. Exptl. Farm, Powarkheda.
Type :- 'M'.

Object :- To determine the dosage and ratio of N to \( P_{2O_5} \) for Wheat under irrigated conditions.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) (a) Clay loam (Mariyar). (b) Refer soil analysis, Powarkheda. (iii) 13.11.1932.
(iv) (a) Bakharising. (b) Drilling. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) N.A. (vii) Irrigated. (vii) Nil.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 3 levels of N as A/S: N0 = 0, N1 = 30 and N2 = 60 lb./ac.
(2) 5 levels of \( P_{2O_5} \) as Super : P0 = 0, P1 = 30, P2 = 60, P3 = 90 and P4 = 120 lb./ac.

3. DESIGN :
(i) 3 x 5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 18' x 33'. (b) 16' x 33'. (v) One line on both sides. (vi) Yes.

4. GENERAL :
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) and (b) N.A.
(vi) and (vii) Nil.

5. RESULTS :

<table>
<thead>
<tr>
<th></th>
<th>P0</th>
<th>P1</th>
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<th>P3</th>
<th>P4</th>
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</table>

|          | Mean |          |          |
|----------|------|----------|
| S.E. of marginal mean of N | = 29.2 lb./ac. |
| S.E. of marginal mean of P | = 37.8 lb./ac. |
| S.E. of body of table     | = 65.4 lb./ac. |

Crop :- Wheat. Ref :- M. P. 51 (56).
Site :- Govt. Exptl. Farm, Powarkheda.
Type :- 'M'.

Object :- To determine the dosage and ratio of N to P under dry conditions.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) (a) Clay loam (Mariyar). (b) Refer soil analysis, Powarkheda. (iii) 28, 29,10.1951 (iv)
(a) Bakharising. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (vi) N.A. (vi) Hy 11—6 (medium). (vii) Unirrigated.
(viii) Nil. (ix) 2.24". (x) N.A.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 3 levels of N as A/S: N0 = 0, N1 = 15 and N2 = 30 lb./ac.
(2) 5 levels of \( P_{2O_5} \) as Super : P0 = 0, P1 = 15, P2 = 30, P3 = 45 and P4 = 60 lb./ac.

3. DESIGN :
(i) 3 x 5 Fact. in R. B. D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) 18' x 66'. (b) 16' x 66'. (v) One row on the both sides (vi) Randomisation not done properly.
4. GENERAL:
(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a), (b) N.A. (vi) Nil. (vii) The field where the expt. is laid out is of poor fertility.

5. RESULTS:
(i) 639 lb./ac.
(ii) 96.98 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>641</td>
<td>631</td>
<td>715</td>
<td>622</td>
<td>570</td>
<td>676</td>
</tr>
<tr>
<td>N₁</td>
<td>712</td>
<td>613</td>
<td>633</td>
<td>650</td>
<td>702</td>
<td>672</td>
</tr>
<tr>
<td>N₂</td>
<td>727</td>
<td>672</td>
<td>581</td>
<td>537</td>
<td>581</td>
<td>620</td>
</tr>
</tbody>
</table>

Mean: 693  639  643  603  618  69

S.E. of marginal mean of N = 25.04 lb./ac.
S.E. of marginal mean of P = 32.33 lb./ac.
S.E. of body of table = 55.99 lb./ac.

---

Crop: Wheat
Site: Govt. Exptl. Farm, Powarkheda.
Object: To determine the dosage and ratio of N to P for Wheat under dry conditions.

1. BASAL CONDITIONS:
(a) (a) Clay loam (Marigal). (b) Refer soil analysis, Powarkheda. (ii) 9.11.1952. (t) Eakharang. (b) Drilled. (c) 80 lb./ac. (d) 12". (e) N.A. (c) N.A. (vi) Hy 11-5 (medium). (vii) Unirrigated. (viii) N.A. (ix) 0.15". (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2).
(1) 3 levels of N as A/S: N₁ = 0, N₂ = 15 and N₃ = 30 lb./ac.
(2) 5 levels of P₂₅₀: P₀ = 0, P₁ = 15, P₂ = 30, P₃ = 45 and P₄ = 60 lb./ac.

3. DESIGN:
(a) 3 × 5 Fact. in R. B. D. (a) 15. (b) N.A. (iii) 1. (iv) 3. (v) 16. (vi) 33". (vii) N.A. (vii) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Weight of grain in each plot and weight of 1000 grains. (iv) (a) 15. (b) No. (c) N.A. (d) N.A. (e) N.A. and (f) Nil.

5. RESULTS:
(i) 404.6 lb./ac.
(ii) 46.72 lb./ac.
(iii) Only P effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>335.6</td>
<td>418.3</td>
<td>386.6</td>
<td>381.5</td>
<td>394.8</td>
<td>389.4</td>
</tr>
<tr>
<td>N₁</td>
<td>409.1</td>
<td>419.9</td>
<td>379.1</td>
<td>462.4</td>
<td>389.1</td>
<td>411.9</td>
</tr>
<tr>
<td>N₂</td>
<td>324.0</td>
<td>425.8</td>
<td>395.0</td>
<td>477.7</td>
<td>447.3</td>
<td>412.6</td>
</tr>
</tbody>
</table>

Mean: 356.3  421.3  388.3  438.2  410.4  404.6

S.E. of marginal mean of N = 12.04 lb./ac.
S.E. of marginal mean of P = 15.57 lb./ac.
S.E. of body of table = 26.96 lb./ac.
Crop : Wheat.
Site : Govt. Exptl. Farm, Powarkheda.
Ref : M.P. 53(43).

Object : To determine the doses and ratio of N to P which give highest yield of Wheat.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) 10 lb./ac. of N as A/S+10 lb./ac. of P₂O₅ as Single Super.
   (ii) (a) Clay loam, Marayar. (b) Refer soil analysis, Powarkheda. (iii) 4.11.1953.
   (iv) (a) Bakharing. (b) N.A. (c) 80 lb./ac. (d) Row 1' apart. (e) N.A. (v) No. (vi) Hy. II improved (medium). (vii) Unirrigated. (viii) No. (ix) 1.25 cm. (x) 14.4.1954.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N₀ = 0, N₁ = 15 and N₂ = 30 lb./ac.
   (2) 5 levels of P₂O₅ as Super : P₀ = 0, P₁ = 15, P₂ = 30, P₃ = 45 and P₄ = 60 lb./ac.

3. DESIGN :
   (i) 3 x 5 Fact. in R.B.D. (ii) (a) 15. (b) N.A. (iii) 3. (iv) (a) and (b) 16' x 33'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) No. (iii) Grain yield. (iv) (a) 1951 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A.

5. RESULTS :
   (i) 349.4 lb./ac.
   (ii) 76.00 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>336.6</td>
<td>353.1</td>
<td>376.6</td>
<td>333.4</td>
<td>363.2</td>
<td>352.6</td>
</tr>
<tr>
<td>N₁</td>
<td>335.0</td>
<td>448.1</td>
<td>303.2</td>
<td>313.1</td>
<td>331.3</td>
<td>350.5</td>
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<tr>
<td>N₂</td>
<td>408.3</td>
<td>339.8</td>
<td>323.2</td>
<td>349.9</td>
<td>284.8</td>
<td>345.2</td>
</tr>
<tr>
<td>Mean</td>
<td>360.0</td>
<td>387.0</td>
<td>334.3</td>
<td>332.1</td>
<td>333.7</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 19.64 lb./ac.
S.E. of marginal mean of P = 25.33 lb./ac.
S.E. of body of table = 43.88 lb./ac.

Crop : Wheat.
Site : Govt. Exptl. Farm, Powarkheda.
Ref : M.P. 48(23).

Object : To study the residual effect of the manures applied to Wheat during 1947-48 upon subsequent Wheat and Gram crops.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) Clay loam (marayar). (b) Refer soil analysis, Powarkheda. (iii) N.A. (iv) (a) Bakharing. (b) to (e) N.A. (v) N.A. (vi) A. 115 (local). (vii) to (x) N.A.

2. TREATMENTS :
   1. Control (no manure).
   2. 10 C.L./ac. of T.C. applied before sowing.
   3. 20 C.L./ac. of T.C. applied before sowing.
   4. 10 C.L./ac. of P.Y.M. applied before sowing.
   5. 20 C.L./ac. of P.Y.M. applied before sowing.
   6. 4 nd./ac. of G.N.C. applied before sowing.
   7. 120 lb./ac. of A/S drilled with seed.

Treatments applied to wheat crop during 1947-48.
3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 16' x 66'. (v) Nil. (vi) N.A.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain and bhuna yield. (iv) (a) 1948-1949. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 572.2 lb./ac.
   (ii) 43.56 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Ave. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Ave. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>508</td>
</tr>
<tr>
<td>2</td>
<td>560</td>
</tr>
<tr>
<td>3</td>
<td>616</td>
</tr>
<tr>
<td>4</td>
<td>581</td>
</tr>
<tr>
<td>5</td>
<td>642</td>
</tr>
<tr>
<td>6</td>
<td>577</td>
</tr>
<tr>
<td>7</td>
<td>521</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>17.76 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Ref.:- M.P. 49(31).  
Site :- Govt. Exptl. Farm, Powarkheda.  
Type :- ‘M’.

Object :- To study the residual effect of the manures applied to Wheat during 1947-48 upon the subsequent Wheat and Gram crops.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Clay loam (Marisol). (b) Refer soil analysis, Powarkheda.
   (iii) 24, 25.10.1949. (iv) (a) Bakharing. (b) Drilling. (c) 100 lb./ac. (d) N.A. (e) N.A. (f) N.A. (vi) A. 115 (local). (vii) to (ix) N.A. (x) 25.3.1950.

2. TREATMENTS:
   1. Control (no manure).
   2. 10 C.L./ac. of T.C. applied before sowing.
   3. 20 C.L./ac. of T.C. applied before sowing.
   4. 10 C.L./ac. of F.Y.M. applied before sowing.
   5. 20 C.L./ac. of F.Y.M. applied before sowing.
   6. 4 red/acre of G.N.C. applied before sowing.
   7. 120 lb./ac. of A/S drilled with seed.

Treatments applied to wheat crop during 1947-48.

3. DESIGN:
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 16' x 66'. (v) Nil. (vi) N.A.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948-1949. (b) Yes. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) The yield is too poor.

5. RESULTS:
   (i) 301.5 lb./ac.
   (ii) 43.82 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Ave. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Ave. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>298.0</td>
</tr>
<tr>
<td>2</td>
<td>275.6</td>
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<td>3</td>
<td>286.7</td>
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<td>4</td>
<td>308.5</td>
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<tr>
<td>5</td>
<td>341.8</td>
</tr>
<tr>
<td>6</td>
<td>313.9</td>
</tr>
<tr>
<td>7</td>
<td>286.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>17.76 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Wheat.  
Site :- Govt. Exptl. Farm, Powarkheda.  

Ref.:- M.P. 48(35).  
Type :- 'M'.

Object :- To see the residual effect of nitrogenous manures applied during the years 1919-1930 to Wheat taken in subsequent years.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam (Mariyar). (b) Refer soil analysis, Powarkheda. (iii) 24.10.1948. (v) (a) Bakharing and ploughing. (b) Drilling. (c) 80 lb./ac. (d) 12". (e) —. (v) Nil. (vi) A. 115 (local). (vii) to (x) N.A.

2. TREATMENTS :
   1. No manure.
   2. 100 md./ac. of F.Y.M. in the beginning of rains every year.
   3. 100 md./ac. of Urine earth at the last bakharing every year.
   4. 6 md./ac. of Castor cake at the last bakharing every year.
   5. 6 md./ac. of Castor cake drilled with seed every year.
   6. 1½ md./ac. of C/N every year.

   Applied during years 1919-1930.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) and (b) 33' x 132'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1931-1949. (b) Yes. (c) N.A. (v) (a) Nil. (b) N.A. (vi) and (vii) N.A.

5. RESULTS :
   (i) 304.1 lb./ac.
   (ii) 16.12 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

   Treatment | Av. yield
   ---------- | -------
   1. | 277.2
   2. | 348.1
   3. | 297.4
   4. | 292.2
   5. | 294.7
   6. | 313.1

   S.E./mean = 11.37 lb./ac.

---

Crop :- Wheat.  
Site :- Govt. Experimental Farm, Powarkheda.  

Ref.:- M.P. 48(46).  
Type :- 'M'.

Object :- To see the residual effect of nitrogenous manures applied during the years 1919-1930 to Wheat taken in subsequent years.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Clay loam (Mariyar). (b) Refer soil analysis, Powarkheda. (iii) N.A. (iv) (a) Bakharing and ploughing. (b) Drilling. (c) N.A. (d) 12". (e) —. (v) Nil. (vi) A-115 (medium). (vii) to (x) N.A.

2. TREATMENTS :
   1. No manure.
   2. 100 md./ac. of F.Y.M. in the beginning of rains every year.
   3. 100 md./ac. of Urine earth at the last bakharing every year.
   4. 6 md./ac. of Castor cake at the last bakharing every year.
   5. 6 md./ac. of Castor cake drilled with seed every year.
   6. 1½ md./ac. of C/N every year.

   Applied during years 1919-1930.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 2. (iv) (a) and (b) 33' x 132'. (v) Nil. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1931 to 1949. (b) Yes. (c) N.A. (v) (a) Nil. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 173.8 lb./ac.
(ii) 20.67 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>153.1</td>
</tr>
<tr>
<td>2.</td>
<td>220.9</td>
</tr>
<tr>
<td>3.</td>
<td>175.6</td>
</tr>
<tr>
<td>4.</td>
<td>161.5</td>
</tr>
<tr>
<td>5.</td>
<td>165.3</td>
</tr>
<tr>
<td>6.</td>
<td>165.5</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 14.61 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Ref.: M.P. 51(57).
Site: Govt. Exptl. Farm, Powarkheda.
Type: 'M'.

Object: To see the effect of application of powdered G.N.C. applied at different timings.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Clay loam (marly). (b) Refer soil analysis, Powarkheda. (iii) 20.10.1951.
(biv) (a) bakharings. (b) N.A. (c) 80 lb./ac. (d) 12'. (a) N.A. (e) N.A. (f) Hy. 11-6 (example). (g) Unirrigated (vii) Nil. (ix) 2.25'. (x) N.A.

2. TREATMENTS:
1. 2 md./ac. of G.N.C. powder applied 3—4 weeks before sowing.
2. 2 md./ac. of G.N.C. powder applied on 15.10.1951 at the time of seed-bed preparation.
3. 2 md./ac. of G.N.C. powder mixed with seed and sown.

3. DESIGN:
(i) R.B.D. (ii) (a) 3. (b) N.A. (iii) (a) and (b) 16.5' x 33'. (iv) Nil. (v) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (c) N.A. (vi) Nil. (vii) Yield too poor due to unfavourable weather conditions.

5. RESULTS:
(i) 140.3 lb./ac.
(ii) 39.96 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>164.9</td>
</tr>
<tr>
<td>2.</td>
<td>149.3</td>
</tr>
<tr>
<td>3.</td>
<td>105.8</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 19.98 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.
Ref.: M.P. 53(42).
Site: Govt. Exptl. Farm, Powarkheda.
Type: 'M'.

Object: To study the effect of N and P applied alone and in combination.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Wheat. (c) 10 lb./ac. of N as A/S+10 lb./ac. of P₂O₅ as Super. (ii) (a) Clay loam (marly).
(b) Refer soil analysis, Powarkheda. (iii) 4.11.1953. (iv) (a) Bakharings. (b) Seed sown with nori plough (c) 80 lb./ac. (d) Rows 1' apart. (e) N.A. (f) Nil. (g) Hy. 11. improved (medium). (h) Unirrigated. (vii) Nil. (ix) 1.25'. (x) 12.4.1954.
2. TREATMENTS:
1. Control (no manure).
2. 15 lb./ac. of N as A/S.
3. 15 lb./ac. of N as G.N.C.
4. 15 lb./ac. of P2O5 as Super.
5. 15 lb./ac. of N as A/S+15 lb./ac. of P2O5 as Super.
6. 15 lb./ac. of N as G.N.C.+15 lb./ac. of P2O5 as Super.
7. 7 lb./ac. of N as A/S+7 lb./ac. of N as G.N.C.+7 lb./ac. of P2O5 as Super.

3. DESIGN:
(i) R.B.D.  (ii) (a) 7.  (b) N.A.  (iii) 5.  (iv) (a) and (b) 33'x33'.  (v) Nil.  (vi) Yes.

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

5. RESULTS:
(i) 509.2 lb./ac.
(ii) 86.80 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>451.9</td>
</tr>
<tr>
<td>2.</td>
<td>549.9</td>
</tr>
<tr>
<td>3.</td>
<td>464.4</td>
</tr>
<tr>
<td>4.</td>
<td>593.4</td>
</tr>
<tr>
<td>5.</td>
<td>543.8</td>
</tr>
<tr>
<td>6.</td>
<td>476.4</td>
</tr>
<tr>
<td>7.</td>
<td>484.3</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=38.80 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.
Site :- Govt. Exptl. Farm, Powarkheda
Object :- To study the effect of different doses and sources of N.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) Wheat.  (c) 10 lb./ac. of N as A/S+10 lb./ac. of P2O5 as Super.  (ii) (a) Clay loam, (marly soil).  (b) Refer soil analysis, Powarkheda.  (iii) 4.11.1953.  (iv) (a) Baklaring.  (b) Sown by nari plough.  (c) 80 lb./ac.  (d) Rows 1' apart.  (e) N.A.  (v) Nil.  (vi) Hy. 11. improved (medium).  (vii) Unirrigated.  (viii) Nil.  (ix) 1.25'.  (x) 14.4.1954.

2. TREATMENTS:
All combinations of (I) and (2)
(I) 3 levels of N : N0=0, N1=15 and N2=30 lb./ac.
(2) 2 sources of N : S1=A/S and S2=C/N.

3. DESIGN:
(i) 2x3 Pact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 5.  (iv) (a) and (b) 11'x59'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) Good.  (ii) Nil.  (iii) Grain yield.  (iv) 1953 N.A.  (b) No.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 520.9 lb./ac.
(ii) 92.10 lb./ac.
(iii) Control not treated, N and S effects are significant. Others are not significant.
Crop: Wheat.

Site: Govt. Exptl. Farm, Powarkheda.

Ref: M.P. 51(25).

Type: ‘M’.

Object: To study the residual effect of P manures applied to previous leguminous crop gram on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A., (b) to (c) As per treatments. (ii) (a) Clay loam (Mariyar). (b) Refer soil analysis, Powarkheda. (iii) 17.10.1950. (iv) (a) 6 ammon. (b) N.A. (c) 80 lb./ac. (d) 12”. (e) N.A. (f) Nil. (v) N.A. (vi) Unirrigated. (vii) Nil. (viii) 2-23. (ix) 26.1.1951.

2. TREATMENTS:
   1. Wheat after wheat.
   2. Wheat after gram.
   3. Wheat after gram+15 lb./ac. of P₂O₅ as B.M.
   4. Wheat after gram+15 lb./ac. of P₂O₅ as Ammo. Phos.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 11’x99’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1952. (b) Yes. (c) N.A. (v) (a) N.A. (b) N.A.

5. RESULTS:
   (i) 609.5 lb./ac.
   (ii) 78.20 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment   Av. yield
   1.          549.3
   2.          610.2
   3.          635.2
   4.          623.1
   S.E./mean = 31.92 lb./ac.
2. TREATMENTS:
1. Wheat after wheat.
2. Wheat after gram.
3. Wheat after gram; gram manured with B.M. at 15 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
4. Wheat after gram; gram manured with Ammo. Phos. at 15 lb./ac. of P<sub>2</sub>O<sub>5</sub>.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 11'×99'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1952. (b) Yes. (c) N.A. (v) (a) to (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 342.5 lb./ac.
(ii) 57.48 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>327.2</td>
</tr>
<tr>
<td>2.</td>
<td>371.4</td>
</tr>
<tr>
<td>3.</td>
<td>369.8</td>
</tr>
<tr>
<td>4.</td>
<td>301.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>23.60 lb./ac.</td>
</tr>
</tbody>
</table>

Crop:— Wheat.
Site:— Govt Exptl. Farm, Powarkhedhda.
Object:— To study the effect of legume gram crop with and without P on the yield of Wheat.
Crop : Wheat.

Site : Govt. Exptl. Farm, Powarkheda.

Ref : M.P. 48(22)

Type : 'M'.

Object : To study the effect of different doses of T.C. with that of F.Y.M., G.N.C. and A/S on wheat and to study its residual effect on subsequent Wheat crop

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) (a) Clay loam (marwath).  (b) Refer soil analysis, Powarkheda.  (iii) 26.2. 10 1448.
   (iv) (a) Bakharing.  (b) Sown by nari.  (c) 80 lb./ac.  (d) 12".  (e) N.A.  (f) N.A.  (g) A/S (Local).
   (vii) N.A.  (viii) Nil.  (ix) and (x) N.A.

2. TREATMENTS :
   1. Control (no manure).
   2. 20 lb./ac. of N as T.C. applied before monsoon.
   3. 40 lb./ac. of N as T.C. applied before monsoon.
   4. 20 lb./ac. of F.Y.M. applied before monsoon.
   5. 40 lb./ac. of N as G.N.C. applied before monsoon.
   6. 10 lb./ac. of N as G.N.C. applied at the beginning of September.
   7. 20 lb./ac. of N as G.N.C. applied at the beginning of September.
   8. 10 lb./ac. of N as A/S drilled with seed.
   9. 20 lb./ac. of N as A/S drilled with seed.

3. DESIGN :
   (i) R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 11's 9'F.  (v) Nil.  (vi) N.A.

4. GENERAL :
   (b) N.A.  (vii) and (viii) Nil.

5. RESULTS :
   (i) 833.2 lb./ac.
   (ii) 75.12 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>735.7</td>
<td>6.</td>
<td>847.0</td>
</tr>
<tr>
<td>2.</td>
<td>752.8</td>
<td>7.</td>
<td>825.4</td>
</tr>
<tr>
<td>3.</td>
<td>757.0</td>
<td>8.</td>
<td>888.2</td>
</tr>
<tr>
<td>4.</td>
<td>742.0</td>
<td>9.</td>
<td>479.7</td>
</tr>
<tr>
<td>5.</td>
<td>846.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 10.60 lb./ac.

Crop : Wheat.

Site : Govt. Exptl. Farm, Powarkheda.

Ref : M.P. 49(30)

Type : 'M'.

Object : To study the residual effect of T. C. and other fertilizers applied to wheat during 1948-49 on the succeeding Wheat crop in the year 1949-50.

1. BASAL CONDITIONS :
   (i) (a) N.A.  (b) Wheat.  (c) As per treatments.  (ii) Clay loam (Marwath).  Refer soil analysis, Powarkheda.
   (iii) 26.10.1949.  (iv) (a) Bakharing.  (b) Sown by plough.  (c) 80 lb./ac.  (d) 12".  (e) N.A.  (f) Nil.  (g) Nil.

2. TREATMENTS :
   1. Control (no manure).
   2. 20 lb./ac. of T.C. applied before monsoon.
   3. 40 lb./ac. of T.C. applied before monsoon.
   4. 20 lb./ac. of F.Y.M. applied before monsoon.
   5. 40 lb./ac. of F.Y.M. applied before monsoon.
   6. 10 lb./ac. of G.N.C. applied at the beginning of September.
   7. 20 lb./ac. of G.N.C. applied at the beginning of September.
   8. 10 lb./ac. as A/S drilled with seed.
   9. 20 lb./ac. as A/S drilled with seed.
3. DESIGN:
(i) R. B. D (ii) 9. (b) N.A. (iii) 6. (iv) (a), (b) 11' x 99'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) Yes. (c) N.A. (v) (a) Jabalpore. (b) N. A. (vi) and (vii) Nil.

5. RESULTS:
(i) 340.8 lb./ac.
(ii) 56.44 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield (lb./ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>328.9</td>
</tr>
<tr>
<td>2.</td>
<td>334.3</td>
</tr>
<tr>
<td>3.</td>
<td>278.9</td>
</tr>
<tr>
<td>4.</td>
<td>357.3</td>
</tr>
<tr>
<td>5.</td>
<td>375.6</td>
</tr>
</tbody>
</table>

S.E./mean = 23.04 lb./ac.

Crop: Wheat.
Ref: M. P. 52 (38).
Site: Govt. Exptl. Farm, Powarkheda.
Type: 'M'.

Object: To study the effect of C/N, A/S and lime on Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Clay loam (Mariyar). (b) Refer soil analysis, Powarkheda. (iii) 31.10.1952 and 1.1.1952. (iv) a) Bakharing. (b) N.A. (c) 80 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) Hy 11-6 (medium). (vii) Unirrigated. (viii) Nil. (ix) 0.15". (x) 11.4. 1953.

2. TREATMENTS:
All combinations of (1) and (2).
(1) 5 manures: M₀=No manure, M₁=20 lb./ac. of N as A/S, M₂=40 lb./ac. of N as A/S, M₃=30 lb./ac. of N as C/N and M₄=40 lb./ac. of N as C/N.
(2) 2 levels of lime: L₀=and L₁=200 lb./ac.

3. DESIGN:
(i) 2 x 5 Fact in R. B. D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a), (b) 18' x 66'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) N.A. (iii) Grain yield. (v) (a) 1952 to 1953. (b) No. (c) N.A. (v) (a) (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 305.6 lb./ac
(ii) 57.73 lb./ac.
(iii) Both L and M effects are highly significant while interaction L x M is not significant.
(iv) Av. yield of grain lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>L₀</td>
<td>379.7</td>
<td>357.8</td>
<td>370.7</td>
<td>294.5</td>
<td>240.6</td>
<td>328.7</td>
</tr>
<tr>
<td>L₁</td>
<td>302.7</td>
<td>334.7</td>
<td>336.9</td>
<td>272.2</td>
<td>165.8</td>
<td>282.5</td>
</tr>
<tr>
<td>Mean</td>
<td>341.2</td>
<td>346.2</td>
<td>353.3</td>
<td>283.3</td>
<td>233.2</td>
<td>305.6</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of M = 16.66 lb./ac.
S.E. of marginal mean of L = 10.54 lb./ac.
S.E. of body of table = 23.57 lb./ac.
Crop :- Wheat.  
Site :- Labhandi Farm, Raipur.  

Ref. :- M.P., 38(23).  
Type :- NOT SPECIFIED.


1. BASAL CONDITIONS : 
   (i) (a) to (c) N.A. (ii) (a) Heavy loam (kandhar). (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) A. 115 (Local) (vii) to (x) N.A. (xi) N.A.

2. TREATMENTS : 
   1. No manure. 
   2. 20 lb./ac. of N as T.C. 
   3. 40 lb./ac. of N as T.C. 
   4. 20 lb./ac. of N as cowdung. 
   5. 40 lb./ac. of N as cowdung.

3. DESIGN : 
   (i) R.B.D. (ii) (a) 9. (b) N.A. 
   (iii) 6. (iv) (a) and (b) 65 x 16 5'. (v) Nil. 
   (vi) Yes.

4. GENERAL : 
   (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Plot wise data N.A.

5. RESULTS : 
   (i) 356 lb./ac. 
   (ii) (iii) N.A. 
   (iv) Av. yield of grain in lb./ac. 

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>223</td>
<td>6.</td>
<td>317</td>
</tr>
<tr>
<td>2.</td>
<td>342</td>
<td>7.</td>
<td>424</td>
</tr>
<tr>
<td>3.</td>
<td>363</td>
<td>8.</td>
<td>314</td>
</tr>
<tr>
<td>4.</td>
<td>283</td>
<td>9.</td>
<td>394</td>
</tr>
<tr>
<td>5.</td>
<td>443</td>
<td>S.F. mean</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Site :- Labhandi Farm, Raipur.  

Ref. :- M.P., 49(38).  
Type :- 'M'.

Object :- To see the effect of T.C. on Wheat as compared to other manures.

1. BASAL CONDITIONS : 
   (i) (a) N.A. (b) Wheat. (c) N.A. (ii) (a) Heavy loam (kandhar). (a) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) A. 115 (local) (vii) to (x) N.A.

2. TREATMENTS : 
   1. No manure. 
   2. 20 lb./ac. of N as T.C. 
   3. 40 lb./ac. of N as T.C. 
   4. 20 lb./ac. of N as cowdung. 
   5. 40 lb./ac. of N as cowdung.

3. DESIGN : 
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 65 x 16 5'. (v) Nil. (vi) Yes.

4. GENERAL : 
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948-1952. (b) Yes (c) N.A. (v) (a) to (b) N.A. (vi) N.A. (vii) Plot wise data N.A.

5. RESULTS : 
   (i) 338 lb./ac. 
   (ii) (iii) N.A.
Crop: Wheat.  Ref: M.P. 50(45).
Site: Labhandi Farm, Raipur.

Object: To see the effect of T.C. on Wheat as compared to other fertilizers.

1. BASAL CONDITIONS:
   (i) Nil.  (b) Wheat.  (c) As per treatments.  (ii) (a) Dorsa—Kankar.  (b) N.A.  (jii) 7.1:1950.  (iv) (a) Two ploughings by country plough after monsoon followed by peg-tooth harrow.  (b) Drilled.  (c) 100 lb./ac.  (d) 12" approximately.  (e) —.  (v) Nil.  (vi) A.115 (local).  (vii) Irrigated.  (viii) Weeding.  (ix) N.A.  (x) 26.3.1951.

2. TREATMENTS:
   1. No manure.  6. 10 lb./ac. of N as G.N.C.
   2. 20 lb./ac. of N as T.C.  7. 20 lb./ac. of N as G.N.C.
   3. 40 lb./ac. of N as T.C.  8. 10 lb./ac. of N as A/S.
   4. 20 lb./ac. of N as cowdung.  9. 20 lb./ac. of N as A/S.
   5. 40 lb./ac. of N as cowdung.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 66'x165'.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Satisfactory. No lodging.  (ii) Nil.  (iii) Grain and straw yield.  (iv) (a) 1948 to 1952.  (b) Yes.  (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
   (i) 463 lb./ac.
   (ii) 108.1 lb./ac.
   (iii) Treatments are not significantly different.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>480</td>
<td>6.</td>
<td>507</td>
</tr>
<tr>
<td>2.</td>
<td>393</td>
<td>7.</td>
<td>590</td>
</tr>
<tr>
<td>3.</td>
<td>424</td>
<td>8.</td>
<td>453</td>
</tr>
<tr>
<td>4.</td>
<td>502</td>
<td>9.</td>
<td>478</td>
</tr>
<tr>
<td>5.</td>
<td>407</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 44.1 lb./ac.

Site: Labhandi Farm, Raipur.

Object: To study the effect of T.C. as compared to other fertilizers on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Wheat.  (c) N.A.  (ii) (a) Heavy loam (kanhar).  (b) N.A.  (jii) 17.10.1951.  (iv) (a) 2 ploughings with country plough after monsoon.  (b) Seeds drilled by nariplough.  (c) 100 lb./ac.  (d) 12" apart.  (e) —.  (v) Nil.  (vi) A.115 (local).  (vii) Irrigated.  (viii) Weeding. (ix) and (x) N.A.
2. TREATMENTS:
1. No manure.  
2. 20 lb./ac. of N as T.C.  
3. 40 lb./ac. of N as T.C.  
4. 20 lb./ac. of N as Cowdung.  
5. 40 lb./ac. of N as Cowdung.  
6. 10 lb./ac. of N as G.N.C.  
7. 20 lb./ac. of N as G.N.C.  
8. 10 lb./ac. of N as A/S.  
9. 20 lb./ac. of N as A/S.  
10. Treat 9 – 20 lb./ac. of P2O5 as Super.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 66°x16′. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good, no lodging. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948 to 1952. (b) No. (c) N.A. (d) (a) and (b) N.A. (e) and (vii) Nil.

5. RESULTS:
(i) 389.5 lb./ac.  
(ii) 110.5 lb./ac.  
(iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>273.5</td>
<td>6.</td>
<td>456.9</td>
</tr>
<tr>
<td>2.</td>
<td>270.1</td>
<td>7.</td>
<td>386.9</td>
</tr>
<tr>
<td>3.</td>
<td>340.2</td>
<td>8.</td>
<td>396.9</td>
</tr>
<tr>
<td>4.</td>
<td>313.3</td>
<td>9.</td>
<td>523.6</td>
</tr>
<tr>
<td>5.</td>
<td>286.8</td>
<td>10.</td>
<td>647.0</td>
</tr>
</tbody>
</table>
S.E./mean  =45.1 lb./ac.

Crop :- Wheat.  
Ref :- M.P. 52(53).  
Site :- Labhandi Farm, Raipur.  
Type :- 'M'.

Object :- To study the effect of T.C. on Wheat as compared to other manures.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Darsa kanhar. (b) N.A. (iii) 17.10.1952. (iv) (a) Ploughing. 
(b) Drilled. (c) 80 lb./ac. (d) N.A. (e) –. (v) Nil. (vi) A, 115 (local). (vii) Irrigated. (viii) Weeding, 
(ix) N.A. (x) 8.3.1953.

2. TREATMENTS:
1. No manure.  
2. 20 lb./ac. of N as T.C.  
3. 40 lb./ac. of N as T.C.  
4. 20 lb./ac. of N as Cowdung.  
5. 40 lb./ac. of N as Cowdung.  
6. 10 lb./ac. of N as G.N.C.  
7. 20 lb./ac. of N as G.N.C.  
8. 10 lb./ac. of N as A/S.  
9. 20 lb./ac. of N as A/S.  
10. Treatment 9 + 20 lb./ac. of P2O5 as Super.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 66°x16′. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1948–1952. (b) and (c) N.A. (d) (a) and (b) N.A. (e) and 
(vii) Nil.

5. RESULTS:
(i) 268.5 lb./ac.  
(ii) 142.5 lb./ac.  
(iii) Treatments differ highly significantly. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>116.7</td>
<td>6.</td>
<td>293.5</td>
</tr>
<tr>
<td>2.</td>
<td>130.1</td>
<td>7.</td>
<td>376.9</td>
</tr>
<tr>
<td>3.</td>
<td>173.4</td>
<td>8.</td>
<td>316.8</td>
</tr>
<tr>
<td>4.</td>
<td>146.7</td>
<td>9.</td>
<td>433.6</td>
</tr>
<tr>
<td>5.</td>
<td>120.1</td>
<td>10.</td>
<td>556.9</td>
</tr>
</tbody>
</table>
S.E./mean  =58.4 lb./ac.
Site :- Labhandi Farm, Raipur.  Type :- 'M'.

Object :- To study the effect of C/N on Wheat.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Paddy. (c) N.A. (ii) (a) Dora. (b) N.A., (iii) 1, 2.1.1953. (iv) (a) Ploughing. (b) (v) Nil. (vi) A, 113 (local). (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) 15.2.1954.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 2 doses of lime : L0 = 0 and L1 = 200 lb./ac.
(2) 5 doses of N : N0 = 0, N1 = 20 lb./ac. of N as A/S, N2 = 40 lb./ac. of N as A/S, N3 = 20 lb./ac. of N as C/N and N4 = 40 lb./ac. of N as C/N.

3. DESIGN :
(i) 2 x 5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 1/40 ac. (v) Nil. (vi) Yes.

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

5. RESULTS :
(i) 248.1 lb./ac.
(ii) 114.8 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>L0</th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>216.8</td>
<td>260.1</td>
<td>223.5</td>
<td>250.0</td>
<td>240.1</td>
<td>234.1</td>
</tr>
<tr>
<td>225.1</td>
<td>233.5</td>
<td>316.8</td>
<td>300.2</td>
<td>215.1</td>
<td>262.1</td>
</tr>
<tr>
<td>Mean</td>
<td>220.9</td>
<td>246.8</td>
<td>280.1</td>
<td>265.1</td>
<td>227.6</td>
</tr>
</tbody>
</table>

Site :- Reura Farm, Satna.  Type :- 'M'.

Object :- To find suitable source of N and its time of application on Wheat crop.

1. BASAL CONDITIONS :
(i) Moong—wheat. (b) Moong. (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 27.12.1953. (iv) (a) Sown by nari plough. (b) N.A. (c) 40 lb./ac. (d) and (e) N.A. (v) Nil. (vi) C-591 (mid late). (vii) Irrigated. (viii) Nil. (ix) 2.00'. (x) 13, 14.4.1954.

2. TREATMENTS :
All combinations of (1) and (2) + a control (no manure).
(1) 3 applications of manure : M1 = A/S at 2½ lb./plot. M2 = Urea at 1½ lb./ac. and M3 = A/N at 1½ lb./plot.
(2) 2 times of application : T1 = At sowing and T2 = At the time of 2nd irrigation after sowing.

3. DESIGN :
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) 40°×27°. (b) 36°×23°. (v) 2' alround. (vi) Yes.

4. GENERAL :
(i) Very poor crop. (ii) Attack of brown rust. No control measures were taken. (iii) Grain yield. (iv) (a) to (c) No. (v) (a) and (b) N.A. (vi) Nil. (vii) Sowing was done late.
5. RESULTS:

(i) 447.4 lb./ac.
(ii) 121.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

Control = 387.5 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T₁</td>
<td>397.8</td>
<td>337.7</td>
<td>509.6</td>
<td>481.0</td>
</tr>
<tr>
<td>T₂</td>
<td>410.0</td>
<td>461.8</td>
<td>427.2</td>
<td>433.0</td>
</tr>
<tr>
<td>Mean</td>
<td>403.9</td>
<td>498.7</td>
<td>468.4</td>
<td>457.0</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of M₁ = 47.8 lb./ac.
S.E. of marginal mean of M₂ = 34.9 lb./ac.
S.E. of body of table = 60.5 lb./ac.

Crop = Wheat.
Site = Govt. Seed and Demonstration Farm, Saugor.
Type = 'M'.

Object = To study the effect of graded doses of C/N in comparison with A/S on Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A.
(ii) (a) Kabar, (b) N.A.
(iii) 30, 31.10.1953.
(iv) (a) N.A.
(v) Sown by narí plow gh. (c) to (c) N.A.
(vi) (a) and (b) N.A.
(vii) NIL.

2. TREATMENTS:

All combinations of (1) and (2)
(1) 4 levels of N: N₀ = 0, N₁ = 15, N₂ = 30, and N₃ = 45 lb./ac.
(2) 2 sources of N: S₁ = A/S and S₂ = C/N.

3. DESIGN:

(i) 2 x 4 Fact. in R.B.D.
(ii) (a) 8.
(iii) 5.
(iv) (a) and (b) 33 x 33' (v) NIL. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A.
(iii) Grain yield.
(iv) (a) to (c) No.
(v) (a) and (b) N.A.
(vi) and (vii) NIL.

5. RESULTS:

(i) 847.8 lb./ac.
(ii) 94.00 lb./ac.
(iii) Only S effect is highly significant.
(iv) Av. yield of grain in lb./ac.

Control = 669.0 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>386.0</td>
<td>938.0</td>
<td>960.0</td>
<td>928.0</td>
</tr>
<tr>
<td>S₂</td>
<td>276.0</td>
<td>780.0</td>
<td>704.0</td>
<td>753.3</td>
</tr>
<tr>
<td>Mean</td>
<td>831.5</td>
<td>859.0</td>
<td>832.0</td>
<td>840.5</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 29.6 lb./ac.
S.E. of marginal mean of S = 24.3 lb./ac.
S.E. of body of table = 42.0 lb./ac.
Site : Govt. Seed and Demonstration Farm, Saugor. Type : ‘M’.

Object :- To study the effect of cotton seed cake in comparison with other fertilizers on Wheat.

1. BASAL CONDITIONS :
   (i) (a) (c) N.A. (ii) (a) Kabar 2. (b) N.A. (iii) 25.10.1951. (iv) (a) to (c) N.A. (d) Rows 12’ apart.
   (e) N.A. (v) N.A. (vi) A. 115. (vii) to (x) N.A. (x) 20.3.1952.

2. TREATMENTS:
   1. Control.
   2. 15 lb./ac. of N as G N.C.
   3. 15 lb./ac. of N as decorticated cotton seedcake.
   4. 15 lb./ac. of N as undecorticated cotton seedcake.
   5. 15 lb./ac. of N as A/S.
   Manures applied on 20.9.1951.

3. DESIGN:
   (i) R.B.D. (ii) (a) S. (b) N.A. (iii) 5. (iv) (a) and (b) 25.75’x42.75’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1553. (b) and (c) N.A. (v) (a) and (b) N.A. (vi)
   and (vii) Nil.

5. RESULTS:
   (i) 349.7 lb./ac.
   (ii) 61.2 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment   Av. yield
   1.        321.0
   2.        412.0
   3.        320.6
   4.        318.5
   5.        376.4
   S.E./mean = 27.60 lb./ac.

Crop : Wheat. Ref : M.P. 52(17).
Site : Govt. Seed and Demonstration Farm, Saugor. Type : ‘M’.

Object :- To study the effect of cotton seed cake in comparison with other manures on Wheat.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) Kabar 2. (b) N.A. (iii) 20.12.1952. (iv) (a) to (c) N.A. (d) Rows 12’ apart.
   (e) N.A. (v) N.A. (vi) A. 115. (vii) to (x) N.A.

2. TREATMENTS:
   1. Control (no manure).
   2. G.N.C. quantity applied N.A.
   3. Decorticated cotton seed cake-quantity applied N.A.
   4. Undecorticated cotton seed cake-quantity applied N.A.
   5. A/S - quantity applied N.A.

3. DESIGN:
   (i) R.B.D. (ii) (a) S. (b) N.A. (iii) 3. (iv) (a) and (b) 33’x16’. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi)
   Nil. (vii) Experiment originally planned with 5 replications. 2 replications discarded due to poor yields.
5. RESULTS:

(i) 536.6 lb/ac.
(ii) 98.56 lb/ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>516.8</td>
</tr>
<tr>
<td>2.</td>
<td>604.8</td>
</tr>
<tr>
<td>3.</td>
<td>476.6</td>
</tr>
<tr>
<td>4.</td>
<td>451.3</td>
</tr>
<tr>
<td>5.</td>
<td>630.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=57.20 lb/ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat. Site: Govt. Seed and Demonstration Farm, Saugor. Type: ‘M’.

Object: To study the effect of cotton seed cake in comparison with other manures on Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Kabar. (b) N.A. (iii) 1.11.1953. (iv) (a) and (b) N.A. (c) 90 lb/ac. (d) and (e) N.A. (v) to (viii) N.A. (ix) 1.75". (x) 5.4.1954.

2. TREATMENTS:

1. Control.
2. G.N.C.—quantity applied N.A.
3. A/S—quantity applied N.A.
4. Fertilizer mixture quantity applied N.A.
5. Decorticated cotton seed cake—quantity applied N.A.
6. Undecorticated cotton seed cake—quantity applied N.A.

3. DESIGN:

(i) R.B.D. (ii) a) 6. (b) N.A. (iii) 5. (iv) (a) and (b) 30’x16’. (v) Nil. (vi) Yos.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 866.0 lb/ac.
(ii) 90.64 lb/ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>784.4</td>
</tr>
<tr>
<td>2.</td>
<td>912.7</td>
</tr>
<tr>
<td>3.</td>
<td>928.4</td>
</tr>
<tr>
<td>4.</td>
<td>960.3</td>
</tr>
<tr>
<td>5.</td>
<td>761.2</td>
</tr>
<tr>
<td>6.</td>
<td>868.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=40.48 lb/ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat. Site: Govt. Seed and Demonstration Farm, Saugor. Type: ‘M’.


1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Kabar 2. (b) N.A. (iii) 20.10.1948. (iv) (a) 3 bahkhorings. (b) Sown by nari plough. (v) to (e) N.A. (v) Nil. (vi) A.O. 90. (vii) N.A. (viii) Nil. (ix) N.A. (x) 28.3.1949.
2. TREATMENTS:
1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66' x 16'4". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1947 to 1953. (modified in 1948) (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 768 lb./ac.
(ii) 43.2 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>667</td>
<td>6.</td>
<td>820</td>
</tr>
<tr>
<td>2.</td>
<td>734</td>
<td>7.</td>
<td>787</td>
</tr>
<tr>
<td>3.</td>
<td>787</td>
<td>8.</td>
<td>753</td>
</tr>
<tr>
<td>4.</td>
<td>757</td>
<td>9.</td>
<td>807</td>
</tr>
<tr>
<td>5.</td>
<td>800</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
S.E./mean = 17.6 lb./ac.

Crop: Wheat.  
Ref: M.P. 49 (28).

Site: Govt. Seed and Demonstration Farm, Sauger. Type: 'M'.


1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) Kobar (i) N.A. (ii) 22.10.49. (a) Bakharing. (b) Sown by nari plough. (c) to (e) N.A. (v) Nil. (vi) A.O.90. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 8.4.1950.

2. TREATMENTS:
1. Control (no manure).
2. 20 lb./ac. of N as T.C.
3. 40 lb./ac. of N as T.C.
4. 20 lb./ac. of N as F.Y.M.
5. 40 lb./ac. of N as F.Y.M.
6. 10 lb./ac. of N as G.N.C.
7. 20 lb./ac. of N as G.N.C.
8. 10 lb./ac. of N as A/S.
9. 20 lb./ac. of N as A/S.

3. DESIGN:
(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 66' x 16'4". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Satisfactory in the beginning, but at later stage the crop suffered from want of moisture in the soil (ii) Nil.

5. RESULTS:
(i) 361.7 lb./ac.
(ii) 84.36 lb./ac.
(iii) Treatments do not differ significantly.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>323.5</td>
<td>6.</td>
<td>353.5</td>
</tr>
<tr>
<td>2.</td>
<td>351.8</td>
<td>7.</td>
<td>358.5</td>
</tr>
<tr>
<td>3.</td>
<td>346.8</td>
<td>8.</td>
<td>440.2</td>
</tr>
<tr>
<td>4.</td>
<td>390.2</td>
<td>9.</td>
<td>378.5</td>
</tr>
<tr>
<td>5.</td>
<td>311.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
S.E./mean = 34.0 lb./ac.
Crop: Wheat. (Rabi)  
Ref: M.P. 49(62).

Site: Govt. Seed and Demonstration Farm, Seoni.  
Type: ‘M’.

Object: To compare the effect of T.C. with other manures and fertilizers in different doses.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a), (b) N.A.  (iii) 11.11.1949.  (iv) (a) Bakharine.  (b) to (e) N.A.  (v) Nil.  (vi) N.A.  

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb/ac. of N as T.C.
   3. 40 lb/ac. of N as T.C.
   4. 20 lb/ac. of N as cowdung.
   5. 40 lb/ac. of N as cowdung.
   6. 10 lb/ac. of N as G.N.C.
   7. 20 lb/ac. of N as G.N.C.
   8. 10 lb/ac. of N as A/S.
   9. 20 lb/ac. of N as A/S.

3. DESIGNS:
   (i) R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a),(b) 1/80. ac.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Good general growth.  (ii) Nil.  (iii) Grain yield.  (iv) (a) N.A.  (b) N.A.  (v) (a), (b) N.A.  (vi) Year of heavy rains with 67.70" as against 51.59" as normal. The distribution was also very unsatisfactory.  (vii) Nil.

5. RESULTS:
   (i) 882 lb/ac.
   (ii) 91.71 lb/ac.
   Treatment differences are highly significant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. Yield</th>
<th>Treatment</th>
<th>Av. Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>726</td>
<td>6.</td>
<td>836</td>
</tr>
<tr>
<td>2</td>
<td>859</td>
<td>7.</td>
<td>926</td>
</tr>
<tr>
<td>3</td>
<td>944</td>
<td>8.</td>
<td>750</td>
</tr>
<tr>
<td>4</td>
<td>868</td>
<td>9.</td>
<td>834</td>
</tr>
<tr>
<td>5</td>
<td>992</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S E/mean = 37.44 lb/ac.

Crop: Wheat. (Rabi)  
Ref: M.P. 50(65).

Site: Govt. Seed and Demonstration Farm, Seoni.  
Type: ‘M’.

Object: To compare the effect of T.C. with other manures and fertilizers.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) N.A.  (c) N.A.  (ii) (a) and (b) N.A.  (iii) 20.10.1950.  (iv) (a) Bakharine.  (b) to (e) N.A.  

2. TREATMENTS:
   1. Control (no manure).
   2. 20 lb/ac. of N as T.C.
   3. 40 lb/ac. of N as T.C.
   4. 20 lb/ac. of N as cowdung.
   5. 40 lb/ac. of N as cowdung.
   6. 10 lb/ac. of N as G.N.C.
   7. 20 lb/ac. of N as G.N.C.
   8. 10 lb/ac. of N as A/S.
   9. 20 lb/ac. of N as A/S.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 1/80. ac.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) Growth almost similar in all the plots.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1949—N.A.  (b) Yes.  (c) N.A.  
   (v) (a) and (b) N.A.  (vi) Comparatively dry year with 42.22" rains only as against 51.59" as average.  (vii) Nil.

5. RESULTS:
   (i) 882 lb/ac.
   (ii) 100.9 lb/ac.
Treatment differences are not significant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>820</td>
<td>6.</td>
<td>852</td>
</tr>
<tr>
<td>2.</td>
<td>926</td>
<td>7.</td>
<td>946</td>
</tr>
<tr>
<td>3.</td>
<td>872</td>
<td>8.</td>
<td>866</td>
</tr>
<tr>
<td>4.</td>
<td>840</td>
<td>9.</td>
<td>900</td>
</tr>
<tr>
<td>5.</td>
<td>904</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 41.2 lb./ac.

Crop: Wheat (Rabi).

Site: Govt. Seed and Demonstration Farm, Seoni.

Type: ‘M’.

Object: To compare the effect of T.C. with other manures and fertilizers with different doses.

1. BASAL CONDITIONS:

   (i) (a) to (c) N.A. (ii) (a) N.A. (b) N.A. (iii) 8.11.1951. (iv) (a) 7 bakharings. (b) to (e) N.A. (v) Nil. (vi) N.M.


2. TREATMENTS:

   1. Control (no manure).
   2. 10 lb./ac. of N as G.N.C.
   3. 20 lb./ac. of N as T.C.
   4. 20 lb./ac. of N as cowdung.
   5. 40 lb./ac. of N as cowdung.

3. DESIGN:

   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) S. (iv) (a) and (b) 32’ x 16’ (v) Nil. (vi) Yes.

4. GENERAL:

   (i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1949 – N.A. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

   (i) 1351 lb./ac.
   (ii) 235.4 lb./ac.

   (iii) Treatment differences are not significant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1230</td>
<td>6.</td>
<td>1492</td>
</tr>
<tr>
<td>2.</td>
<td>1432</td>
<td>7.</td>
<td>1266</td>
</tr>
<tr>
<td>3.</td>
<td>1432</td>
<td>8.</td>
<td>1372</td>
</tr>
<tr>
<td>4.</td>
<td>1226</td>
<td>9.</td>
<td>1328</td>
</tr>
<tr>
<td>5.</td>
<td>1372</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 96.1 lb./ac.

Crop: Wheat (Rabi).

Site: Govt. Seed and Demonstration Farm, Seoni.

Type: ‘M’.

Object: To compare the residual effect of T.C. with other manures.

1. BASAL CONDITIONS:

   (i) (a) Nil. (b) Wheat. (c) As per treatments (ii) (a) N.A. (b) N.A. (iii) 17-9-1952. (iv) (a) 5 bakharings (b) to (e) N.A. (v) Nil. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) 19.3.1951.
2. TREATMENTS:

1. No manure (Contrl). 6. 10 lb./ac. of N as G.N.C.
2. 20 lb./ac. of N as T.C. 7. 21 lb./ac. of N as G.N.C.
3. 40 lb./ac. of N as T.C. 8. 10 lb./ac. of N as A/S.
4. 20 lb./ac. of N as cowdung. 9. 20 lb./ac. of N as A/S.
5. 40 lb./ac. of N as cowdung.

Treatments applied in 1949-1950 to wheat crop. Residual effect studied.

3. DESIGN:

(i) R. B. D.  (ii) (a) 9 (b) N.A.  (iii) 6 (iv) (a), (b) 33' x 16'  (v) Nil.  (vi) Yes.

4. GENERAL:

(i) Crop growth was similar in all the plots. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-continued. (b), (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 913 lb./ac.
(ii) 158.5 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>8.6</td>
<td>6.</td>
<td>8.56</td>
</tr>
<tr>
<td>2.</td>
<td>90.6</td>
<td>7.</td>
<td>93.0</td>
</tr>
<tr>
<td>3.</td>
<td>9.04</td>
<td>8.</td>
<td>8.72</td>
</tr>
<tr>
<td>4.</td>
<td>9.96</td>
<td>9.</td>
<td>8.84</td>
</tr>
<tr>
<td>5.</td>
<td>9.46</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 64.8 lb./ac.

Crop: -- Wheat

Site: -- Govt. Seed and Demonstration Farm, Seoni

Ref: -- M.P. 51(87), Type: -- 'M'

Object: -- To compare the Residual effect of T.C. with other manures and fertilisers.

1. BASAL CONDITIONS:

(i) Nil.  (b) Wheat  (c) As per treatments. (ii) (a), (b) N.A.  (iii) 18.11.1951. (iv) (a) 7 b.chhar.ages
(b) to (e) N.A.  (v) Nil.  (vi) N.A.  (vii) unirrigated. (viii) N.A.  (ix) N.A.  (x) 23.3.1952.

2. TREATMENTS:

1. No manure (control). 6. 10 lb./ac. of N as G.N.C.
2. 20 lb./ac. of N as T.C. 7. 21 lb./ac. of N as G.N.C.
3. 40 lb./ac. of N as T.C. 8. 10 lb./ac. of N as A/S.
4. 20 lb./ac. of N as cowdung. 9. 20 lb./ac. of N as A/S.
5. 40 lb./ac. of N as cowdung.

Treatments applied in 1950-1951 to wheat crop. Residual effect studied.

3. DESIGN:

(i) R.B.D.  (ii) (a) 9 (b) N.A.  (iii) 6 (iv) (a) and (b) 33' x 16'.  (v) Nil.  (vi) Yes.

4. GENERAL:

(i) Crop growth was uniform in all the plots of all the treatments. (ii) Nil. (iii) Grain yield. (iv) (a) 1950-Continued. (b), (c) N.A. (v) (a) and (b) N.A. (vi) & (vi) Nil.

5. RESULTS:

(i) 3034 lb./ac.
(ii) 27.0 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1106</td>
<td>6.</td>
<td>1052</td>
</tr>
<tr>
<td>2.</td>
<td>546</td>
<td>7.</td>
<td>1100</td>
</tr>
<tr>
<td>3.</td>
<td>780</td>
<td>8.</td>
<td>1066</td>
</tr>
<tr>
<td>4.</td>
<td>960</td>
<td>9.</td>
<td>1292</td>
</tr>
<tr>
<td>5.</td>
<td>960</td>
<td>S.E./mean</td>
<td>5.36 lb./ac.</td>
</tr>
</tbody>
</table>
Crop : Wheat (Rabi).
Ref : M.P. 51(83).

Site : Govt. Seed and Demonstration Farm, Seoni. Type : 'M'.

Object :—To compare the effect of cotton seed cake, decorticated and undecorticated with other cakes and fertilizers.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 9.11.1951. (iv) (a) 7 bakharsings. (b) to (e) N.A. (v) Nil.
   (vi) N.A. (vii) Unirrigated. (viii) and (ix) N.A. (x) 27.3.1952.

2. TREATMENTS :
   1. No manure.
   2. 20 lb./ac. of N as G.N.C.
   3. 20 lb./ac. of N as decorticated cotton seed cake.
   4. 20 lb./ac. of N as undecorticated cotton seed cake.
   5. 20 lb./ac. of N as A/S.
   6. 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6, (b) N.A. (iii) 5, (iv) (a) and (b) 33'X16'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Crop looked similar in all the plots. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—continued. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Rain-fall was sub-normal (40.39' only as against 51.68') and there were no winter showers. (vii) Nil.

5. RESULTS :
   (i) 1301 lb./ac.
   (ii) 137.8 lb./ac.
   (iii) Treatment differences are significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1328</td>
</tr>
<tr>
<td>2</td>
<td>1168</td>
</tr>
<tr>
<td>3</td>
<td>1152</td>
</tr>
<tr>
<td>4</td>
<td>1230</td>
</tr>
<tr>
<td>5</td>
<td>1536</td>
</tr>
<tr>
<td>6</td>
<td>1424</td>
</tr>
<tr>
<td>S.E. of mean</td>
<td>84.0 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat (Rabi).
Ref :- M.P. 52(71).

Site : Govt. Seed and Demonstration Farm, Seoni. Type :- 'M'.

Object :—To compare the effect of cotton seed cake, decorticated and undecorticated with other fertilizers.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 14.10.1952. (iv) (a) 7 bakharsings. (b) to (e) N.A. (v) Nil.
   (vi) N.A. (vii) Unirrigated. (viii) and (ix) N.A. (x) 16.3.1953.

2. TREATMENTS :
   1. No manure.
   2. 20 lb./ac. of N as G.N.C.
   3. 20 lb./ac. of N as decorticated cotton seed cake.
   4. 20 lb./ac. of N as undecorticated cotton seed cake.
   5. 20 lb./ac. of N as A/S.
   6. 20 lb./ac. of N as A/S+20 lb./ac. of P_2O_5 as Super.

3. DESIGN :
   (i) R.B.D. (ii) (a) 6, (b) N.A. (iii) 5. (iv) (a) and (b) 33'X16'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Crop looked similar in all the plots. (ii) Nil. (iii) Grain yield. (iv) (a) 1951—continued. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 581 lb./ac.

(ii) 50.71 lb./ac.

(iii) Treatment differences are not significant.

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

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>576</td>
</tr>
<tr>
<td>2</td>
<td>552</td>
</tr>
<tr>
<td>3</td>
<td>560</td>
</tr>
<tr>
<td>4</td>
<td>592</td>
</tr>
<tr>
<td>5</td>
<td>592</td>
</tr>
<tr>
<td>6</td>
<td>576</td>
</tr>
</tbody>
</table>

S.E./mean = 22.68 lb./ac.

Crop: Wheat (Rabi).

Site: Govt. Seed and Demonstration Farm, Seoni.

Object — To compare the effect of cotton seed cake, decorticated and undecorticated, with control and manures.

1. BASAL CONDITIONS:

(a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 27.12.1931. (v) (a) +20 lb./ac. of P₂O₅ as Super. (v) N.A. (vi) 93. (vii) Unirrigated. (viii) and (ix) N.A. 18, 21.3.1934.

2. TREATMENTS:

1. No manure (control).

2. 20 lb./ac. of N as G.N.C.

3. 20 lb./ac. of N as cotton seed cake decorticated.

4. 20 lb./ac. of N as cotton seed cake undecorticated.

5. 21 lb./ac. of N as A/S.

6. 20 lb./ac. of N as A/S+20 lb./ac. of P₂O₅ as Super.

7. 164 lb./ac. of G.N.C.+54 lb./ac. of A/S+20 lb./ac. of P₂O₅ as Super.

3. DESIGN:

(i) R.B.D. (ii) 7. (b) N.A. (iii) S. (iv) (a) and (b) N.A. (v) 18. (vii) N.A. (viii) Yes.

4. GENERAL:

(i) Crop uniform in all the plots. (ii) Nil. (iii) Grain yield. (iv) (a) 1931—continue (b) and (c) N.A. 1932 (a) and (b) N.A. (v) The season was very droughty. (vi) Nil.

5. RESULTS:

(i) 94 lb./ac.

(ii) 94.76 lb./ac.

(iii) Treatment differences are highly significant.

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

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>744</td>
</tr>
<tr>
<td>2</td>
<td>1036</td>
</tr>
<tr>
<td>3</td>
<td>979</td>
</tr>
<tr>
<td>4</td>
<td>1011</td>
</tr>
<tr>
<td>5</td>
<td>1099</td>
</tr>
<tr>
<td>6</td>
<td>1012</td>
</tr>
<tr>
<td>7</td>
<td>1099</td>
</tr>
</tbody>
</table>

S.E./mean = 28.06 lb./ac.
Crop: Wheat.  
Ref: M.P. 49(62).

Site: Govt. Seed and Demonstration Farm, Seoni.  
Type: 'M'.

Object: To compare the effect of T.C. with other manures and fertilizers on Wheat yield.

1. BASAL CONDITIONS:
   (i) (a) Nil, (b) and (c) N.A.  
   (ii) (a) and (b) N.A.  
   (iii) 11-11-1949.  
   (iv) (a) 6 bakharings.  
   (b) to (e) N.A.  
   (v) Nil,  
   (vi) N.A.  
   (vii) Unirrigated.  
   (viii) and (ix) N.A.  
   (x) 28.3.1950.

2. TREATMENTS:
   1. Control.  
   2. 10 lb./ac. of N as T.C.  
   3. 40 lb./ac. of N as T.C.  
   4. 20 lb./ac. of N as cattle dung.  
   5. 40 lb./ac. of N as cattle dung.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 9.  
   (b) N.A.  
   (iii) 28.10.1953.  
   (iv) (a) to (e) N.A.  
   (v) Nil.  
   (vi) A.O. 90.  
   (vii) Unirrigated.  
   (viii) N.A.  
   (ix) N.A.  
   (x) 21.3.1954.

4. GENERAL:
   (i) Good.  
   (ii) N.A.  
   (iii) Grain yield.  
   (iv) (a) 1949—contd.  
   (b) No.  
   (c) Nil.  
   (v) to (viii) N.A.

5. RESULTS:
   (i) 858 lb./ac.  
   (ii) 91.7 lb./ac.  
   (iii) Treatments differ highly significantly.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>726</td>
<td>6.</td>
<td>816</td>
</tr>
<tr>
<td>2.</td>
<td>850</td>
<td>7.</td>
<td>926</td>
</tr>
<tr>
<td>3.</td>
<td>914</td>
<td>8.</td>
<td>750</td>
</tr>
<tr>
<td>4.</td>
<td>868</td>
<td>9.</td>
<td>834</td>
</tr>
<tr>
<td>5.</td>
<td>992</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 37.44 lb./ac.

Crop: Wheat (Rabi).  
Ref: M.P. 53(85).  

Site: Govt. Seed and Demonstration Farm, Seoni.  
Type: 'M'.

Object: To compare the effect of C/N with other fertilizers on Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  
   (ii) (a) to (b) N.A.  
   (iii) 28.10.1953.  
   (iv) (a) to (e) N.A.  
   (v) Nil.  
   (vi) A.O. 90.  
   (vii) Unirrigated.  
   (viii) N.A.  
   (ix) N.A.  
   (x) 21.3.1954.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N: N1=0, N2=15 and N3=30 lb./ac.
   (2) 2 sources of N: S1=A/S and S2=C/N.

3. DESIGN:
   (i) 3 x 2 Fact. in R.B.D.  
   (ii) (a) 6.  
   (b) N.A.  
   (iii) 5.  
   (iv) (a) and (b) 49° 22'.  
   (v) Nil.  
   (vi) Yes.

4. GENERAL:
   (i) Crop growth was uniform in all the replications, but later due to excessive draught, cracks were formed unevenly. Withering of plants in the cracked area.  
   (ii) Nil.  
   (iii) Grain yield.  
   (iv) (a) to (c) N.A.  
   (v) (a) to (b) N.A.  
   (vi) Excessively drought condition effected the crop rather adversely.  
   (vii) Nil.

5. RESULTS:
   (i) 769 lb./ac.  
   (ii) 125 lb./ac.  
   (iii) Effect of N is highly significant and of S is significant.  
   Interaction is not significant.
Crop: Wheat.

Site: Central Res. Farm, Ujjain.

Object: To study the effect of different measures on Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.11.1953. (iv) (a) Tractor ploughing and bakkari. (b) Drilled. (c) 25 seed/ac. (d) 12'. (e) Nil. (v) G.D. 11. (vi) Un irrigated. (vii) Nil. (ix) N.A. (x) 28.3.1954.

2. TREATMENTS:
   1. Control (no manure).
   2. 50 lb./ac. of A/S.
   3. 170 lb./ac. of G.N.C.
   4. 50 lb./ac. of A/S+56 lb./ac. of Super.
   5. 25 lb./ac. of A/S+85 lb./ac. of G.N.C.
   6. 170 lb./ac. of G.N.C+6 lb./ac. of Super.
   7. 50 lb./ac. of A/S+170 lb./ac. of G.N.C.+112 lb./ac. of Super.
   8. 340 lb./ac. of Manure.  
      Super drilled before sowing 4' deep and then levelled. A/3, Manure and G.N.C. mixed with the soil and drilled.

3. DESIGN:
   (i) R.B.D. (ii) 8. (b) N.A. (iii) 4. (iv) (a) 8'x60'. (b) 6'x54'. (c) 1'x3'. (vi) Yes.

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

5. RESULTS:
   (i) 395.1 lb./ac.
   (ii) 57.29 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>432.6</td>
<td>5.</td>
<td>410.0</td>
</tr>
<tr>
<td>2.</td>
<td>358.0</td>
<td>6.</td>
<td>403.2</td>
</tr>
<tr>
<td>3.</td>
<td>380.1</td>
<td>7.</td>
<td>404.3</td>
</tr>
<tr>
<td>4.</td>
<td>376.9</td>
<td>8.</td>
<td>364.3</td>
</tr>
</tbody>
</table>

S.E./mean = 28.64 lb./ac.

Object: To find out suitable manurial dose for Wheat under dry conditions.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Gram. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 29, 30.10.1950. (iv) (a) Bakharings. (b) and (c) N.A. (d) Rows 1’ apart. (e) N.A. (v) Nil. (vi) G.D. 11 (late). (vii) Unirrigated. (viii) Nil. (ix) and (x) N.A.

2. TREATMENTS:
   1. Control (no manure).
   2. 10 lb./ac. of N.
   3. 20 lb./ac. of N.
   4. 30 lb./ac. of N.
   5. 40 lb./ac. of N.
   6. 10 lb./ac. of N+10 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   7. 10 lb./ac. of N+20 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   8. 10 lb./ac. of N+30 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   9. 20 lb./ac. of N+30 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   10. 20 lb./ac. of N+40 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   11. 20 lb./ac. of N+40 lb./ac. of P<sub>2</sub>O<sub>5</sub>.

Source of N for treatments 2 to 8 is A/S while for 9 to 11, it is A/S and G.N.C. in 1 : 1 ratio. Source of P<sub>2</sub>O<sub>5</sub> is Super.

3. DESIGN:
   (i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) 16’×96’. (b) 12’×90’. (v) 2’×3’. (v) Yes.

4. GENERAL:
   (i) Fair. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1950–1951. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1610 lb./ac.
   (ii) 232.7 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1385</td>
<td>7.</td>
<td>1891</td>
</tr>
<tr>
<td>2.</td>
<td>1404</td>
<td>8.</td>
<td>1803</td>
</tr>
<tr>
<td>3.</td>
<td>1337</td>
<td>9.</td>
<td>1843</td>
</tr>
<tr>
<td>4.</td>
<td>1356</td>
<td>10.</td>
<td>1834</td>
</tr>
<tr>
<td>5.</td>
<td>1327</td>
<td>11.</td>
<td>1891</td>
</tr>
<tr>
<td>6.</td>
<td>1642</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>S.E./mean  = 95.1 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>


Object: To find out suitable manurial dose for Wheat under dry conditions with a view to increase the output.

1. BASAL CONDITIONS:
   (i) Nil. (b) Groundnut. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 17, 18.10.1951. (iv) (a) Bakharings. (b) and (c) N.A. (d) Rows 1’ apart. (e) N.A. (v) Nil. (vi) G.D. 11 (late). (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 13.3.1952.

2. TREATMENTS:
   1. Control (no manure).
   2. 10 lb./ac. of N.
   3. 10 lb./ac. of N+20 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   4. 10 lb./ac. of N+30 lb./ac. of P<sub>2</sub>O<sub>5</sub>.
   5. 20 lb./ac. of N.
   6. 20 lb./ac. of N+30 lb./ac. of P<sub>2</sub>O<sub>5</sub>.

Source of N for treatments 2 to 8 is A/S while from 9 to 11 it is A/S and G.N.C. in 1 : 1 ratio. Source of P<sub>2</sub>O<sub>5</sub> is Super.
3. DESIGN:
(i) R.B.D. (ii) (a) H. (b) N.A. (iii) 5. (iv) (a) 16' x 95'; (b) 12' x 90'; (v) 2' x 3'. (vi) Yes.

4. GENERAL:
(i) Poor due to lack of winter rains. (ii) Nil. (i) Grain and straw yield. (iv) (a) 1930—1931. (b) No. (v) N.A. (vi) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 679.3 lb./ac.
(ii) 158.1 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>807</td>
<td>7.</td>
<td>578</td>
</tr>
<tr>
<td>2.</td>
<td>7.0</td>
<td>8.</td>
<td>596</td>
</tr>
<tr>
<td>3.</td>
<td>645</td>
<td>9.</td>
<td>597</td>
</tr>
<tr>
<td>4.</td>
<td>745</td>
<td>10.</td>
<td>597</td>
</tr>
<tr>
<td>5.</td>
<td>807</td>
<td>11.</td>
<td>599</td>
</tr>
<tr>
<td>6.</td>
<td>670</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 64.2 lb./ac.

crop: Wheat.
Site: Central Res. Farm, Ujjain.

Object: To study the effect of graded doses of K manure on the yield of wheat grain.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Gram. (c) Nil. (ii) (a) Black cotton seed. (b) N.A. (iii) 1930, 1931. (iv) (a) 6 lb/manure.
(b) Seeds drilled, (c) 25 s/a. (d) Rows 12' apart approximately. (v) — (vi) Nil. (vii) G. D. II. (viii) Unirrigated. (ix) Nil. (x) 3.75'. (x) 15.3.1932.

2. TREATMENTS:
1. No manure.
2. 31 lb./ac. of N as K manure.
3. 60 lb./ac. of N as K manure.
4. 90 lb./ac. of N as K manure.
Manure applied by broadcasting.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) 147' x 125'; (iii) 6. (iv) (a) 35' x 125'; (b) 28' x 115'. (v) 3 rows on both sides and 1 foot of each row at both ends. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1930. (b) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 48'. (ii) 63.73 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>466</td>
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<tr>
<td>2.</td>
<td>410</td>
</tr>
<tr>
<td>3.</td>
<td>457</td>
</tr>
<tr>
<td>4.</td>
<td>408</td>
</tr>
</tbody>
</table>

S.E./mean = 25.61 lb./ac.
Crop: Wheat  
Ref: M. P. 53(79).

Site: Govt. Seed and Demonstration Farm, Warasen.  
Type: 'M'.

Object: To see the effect of C/N in comparison with A/S on Wheat after paddy.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a), (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) N.A. (ix) 0.38°. (x) N.A.

2. TREATMENTS:
   1. Control.
   2. 15 lb./ac. of N as A/S.
   3. 30 lb./ac. of N as A/S.
   4. 15 lb./ac. of N as C/N.
   5. 30 lb./ac. of N as C/N.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a), (b) 1/40 ac. (v) Nil. (vi) N.A.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Raw data N.A.

5. RESULTS:
   (i) 802.5 lb./ac.
   (ii) N.A.
   (iii) N.A.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>680</td>
</tr>
<tr>
<td>2</td>
<td>756</td>
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<tr>
<td>3</td>
<td>884</td>
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<tr>
<td>4</td>
<td>764</td>
</tr>
<tr>
<td>5</td>
<td>928</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

Crop: Wheat (Rabi).  
Ref: M. P. 53(92).

Site: Govt. Seed and Demonstration Farm, Warasen. 
Type: 'M'.

Object: To study the effect of C/N in comparison with A/S on Wheat.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Paddy. (c) N.A. (ii) to (iv) N.A. (v) Nil. (vi) to (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2) + a control.
   (1) 2 levels of N: N_1 = 15 and N_2 = 30 lb./ac.
   (2) 2 sources of N: S_1 = A/S and S_2 = C/N.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/40 ac. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) to (e) N.A. (c) to (vii) N.A.

5. RESULTS:
   (i) 802 lb./ac.
   (ii) 106.5 lb./ac.
   (iii) Control vs., others effect is significant, N effect is highly significant while other effects are not significant.
160

160

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

Control = 680 lb./ac.

<table>
<thead>
<tr>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>756</td>
<td>884</td>
<td>820</td>
</tr>
<tr>
<td>764</td>
<td>928</td>
<td>896</td>
</tr>
</tbody>
</table>

Mean 760 906 834

S. E. of any marginal mean = 33.7 lb./ac.

S. E. of body of table = 7 6 lb./ac.

Crop : Wheat.

Centre : Obedullganj (M.P.).

Object : To study the effect of artificial fertilizers in conjunction with organic manures.

1. BASAL CONDITIONS:

(1) a N.A. (b) N.A. (c) N.A. (d) Loose in texture and seem black on exposure to N.A. [29] (0) 45.


2. TREATMENTS:

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

(1) 3 levels of N: N1 = 0, N2 = 20 and N3 = 40 lb./ac.

(2) 3 levels of P: P1 = 0, P2 = 20 and P3 = 40 lb./ac.

(3) 3 levels of F.Y.M.: F1 = 2, F2 = 4 and F3 = 6 T. C. C. H. E.

F.Y.M. spread a week before sowing. N as A.S. was broadcast just before sowing & P, F1 & F2 were mixed with the seed and drilled.

3. DESIGN:

(i) 3 rep. (ii) 9 plots/block and 3 blocks/replica. (iii) N.A. (a) 4 (b) N.A. (c) N.A. (d) 7 (e) 14.

4. GENUS:

(iii) Normal. (i) Case of loose-sow was noticed throughout the experiment. (b) Grain yield. (c) Yield 1933 to 56. (b) Nos. (c) N.A. (d) N.A. (e) N.A. (f) N.A. (g) N.A.

5. RESULTS:

(i) 880 lb./ac.

(ii) 792 lb./ac.

(iii) Only the interaction N x F is significant.

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

<table>
<thead>
<tr>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
<td>861</td>
<td>889</td>
<td>1035</td>
<td>928</td>
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<td>894</td>
<td>842</td>
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</tr>
<tr>
<td>842</td>
<td>869</td>
<td>918</td>
<td>836</td>
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</table>

Mean 835 865 939

<table>
<thead>
<tr>
<th>F0</th>
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<th>F2</th>
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<td>926</td>
<td>944</td>
</tr>
<tr>
<td>996</td>
<td>908</td>
<td>846</td>
</tr>
</tbody>
</table>

S. E. of any marginal mean = 26.51 lb./ac.

S. E. of body of any table = 45.56 lb./ac.
Crop: Wheat.  
Ref: Complex experiments (T.C.M.), 1953.  
Centre: Obedullgunj (M.P.).  
Type: 'M'.

Object: To study the effect of artificial fertilizers in conjunction with organic manures.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Loam in texture and deep black in colour.  (b) N.A.  (iii) 29.10.1953.  (iv) and (v) N.A.  (vi) C-59.  (vii) Irrigated.  (viii) Nil.  (ix) 51.42°.  (x) 27.4.1954.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(I) 3 levels of N: N₀ =0, N₁ =20 and N₂ =40 lb./ac.
(2) 3 levels of P₂O₅: P₀ =0, P₁ =20 and P₂ =40 lb./ac.
(3) 3 levels of F.Y.M.: F₀ =0, F₁ =10 and F₂ =20 C.L./ac.
N as A/S broadcast one week before sowing where as P₂O₅ as Super was mixed with the seed and drilled. F.Y.M. spread in the plot one week before sowing.

3. DESIGN:
(i) 3³ Conf.  (ii) (a) 9 plots/block and 3 blocks/replication.  (b) N.A.  (iii) 1.  (iv) (a) N.A.  (b) 3x3 x 25'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) Normal.  (ii) Crop suffered slightly from loose-smut and grass-hopper.  (iii) Grain yield.  (iv) (a) 1953–1956.  (b) No.  (c) N.A.  (v) (a) Nil.  (vi) and (vii) Nil.

5. RESULTS:
(i) 1335 lb./ac.
(ii) 264.9 lb./ac.
(iii) Main effects of N and F are significant.  Other effect and interactions are not significant.
(iv) Av. yield c.f. grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>F₀</th>
<th>F₁</th>
<th>F₂</th>
<th>Mean S.E.</th>
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<td>1409</td>
<td>1491</td>
<td>1368</td>
<td>916</td>
<td>1426</td>
<td>1732</td>
<td>= 88.3 lb./ac.</td>
</tr>
<tr>
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<td>1265</td>
<td>1518</td>
<td>1288</td>
<td>1145</td>
<td>1182</td>
<td>1538</td>
<td></td>
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<tr>
<td>F₂</td>
<td>1008</td>
<td>1359</td>
<td>1673</td>
<td>1347</td>
<td>1063</td>
<td>1549</td>
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<th></th>
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<th>Mean</th>
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<th></th>
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<th>S.E. of body of any tabe</th>
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<tr>
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<td>1270</td>
<td>1051</td>
<td>1386</td>
<td>1566</td>
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<td>=152.9 lb./ac.</td>
</tr>
<tr>
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<tr>
<td>F₂</td>
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<td>1720</td>
<td></td>
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</tbody>
</table>

Crop: Wheat.  
Ref: Complex experiments (T.C.M.), 1953.  
Centre: Obedullgunj (M.P.).  
Type: 'M'.

Object: To study the effect of types and levels of N and P on non-acid soils (unirrigated).

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Loam in texture and deep black in colour.  (b) N.A.  (iii) 28.10.1953.  (iv) and (v) N.A.  (vi) C-59.  (vii) Unirrigated.  (viii) Nil.  (ix) 33.42°.  (x) 22.4.1954.

2. TREATMENTS:
All combinations of (1), (2) and (3)+3 extra treatments.
(I) 3 sources of N: S₁=A/S, S₂=A and S₃=Urea.
3. DESIGN:
(i) R.B.D. (ii) (a) 12 plots/block and 3 blocks/replication +3 extra treatments in each block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 30'x25'. (v) N.A.

4. RESULTS:
(i) 967 lb./ac.
(ii) 102.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

\[
\begin{align*}
\text{N}_0 & = 0, \text{N}_1 = 20, \text{N}_2 = 40 \text{ lb./ac.} \\
\text{P}_0 & = 0, \text{P}_1 = 20, \text{P}_2 = 40 \text{ lb./ac.} \\
\text{T}_1 & = 60 \text{ lb./ac. of N+40 lb./ac. of P}_2 \text{O}_5, \text{T}_2 = 40 \text{ lb./ac. of N+80 lb./ac. of P}_2 \text{O}_5 \text{ and } \text{T}_3 = 60 \text{ lb./ac. of N+80 lb./ac. of P}_2 \text{O}_5.
\end{align*}
\]

N applied as A/S and P\textsubscript{2}O\textsubscript{5} as Super.
N applied broadcast before sowing while Super was mixed with seed and sown along with seed.

5. RESULTS:
(i) 967 lb./ac.
(ii) 102.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
</tr>
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<tr>
<td>P_0</td>
<td>866</td>
<td>988</td>
<td>993</td>
</tr>
<tr>
<td>P_1</td>
<td>913</td>
<td>946</td>
<td>968</td>
</tr>
<tr>
<td>P_2</td>
<td>928</td>
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<td>1057</td>
</tr>
<tr>
<td>Mean</td>
<td>903</td>
<td>991</td>
<td>1056</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean in N \times P or S \times P table = 34.7 lb./ac.
S.E. of marginal mean of N in N \times S table = 9.3 lb./ac.
S.E. of marginal mean of S in N \times S table = 31.2 lb./ac.
S.E. of body of N \times P or S \times P table = 59.2 lb./ac.
S.E. of body of S \times N table = 55.8 lb./ac.
S.E. of T_1, T_2, or T_3 mean = 59.2 lb./ac.

Crop: Wheat.  
Ref.: Complex experiments (T.C.M.), 1953.  
Centre: Obedullaganj (M.P.).  
Type = 'M'.

Object: (I/a). To study the effect of types and levels of N and P on non-acid soils.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Loam in texture, deep black in colour. (b) N.A. (iii) 27.10.1953. (iv) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) Nil. (ix) 53.42'. (x) 27, 28-3.1954.

2. TREATMENTS:
All combinations of (1), (2); and (3)+3 extra treatments.
(1) 3 levels of N : N_0 = 0, N_1 = 20 and N_2 = 40 lb./ac.
(2) 3 sources of N : S_1 = A, S_2 = A/N and S_3 = Urea.
(3) 3 levels of P\textsubscript{2}O\textsubscript{5} : P_0 = 0, P_1 = 20 and P_2 = 40 lb./ac.
and 3 extra treatments : T_1 = 60 lb./ac. of N+40 pb./ac. of P\textsubscript{2}O\textsubscript{5}T_2 = 40 lb./ac. of N+80 lb./ac. of P\textsubscript{2}O\textsubscript{5}T_3 = 60 lb./ac. of N+80 lb./ac. of P\textsubscript{2}O\textsubscript{5}.
N as A/S broadcast before sowing and Super mixed with seed and was sown along with the seed.
3. **DESIGN:**
(i) R.B.D. (ii) (a) 12 plots/block and 3 blocks/replication+3 extra treatments in each block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 30'x25'. (v) N.A. (vi) Yes.

4. **GENERAL:**
(i) Normal, no lodging. (ii) Attack of grass-hopper and loose-smut was noticed. (iii) Grain yield. (iv) (a) 1953-1956. (b) No. (c) N.A. (v) (a) Kotah and Niphad. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
(i) 1247 lb./ac. (ii) 202 9 lb./ac. (iii) Main effects of N and P are highly significant. Others are not significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P_0</th>
<th>P_1</th>
<th>P_2</th>
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<tr>
<td>S_3</td>
<td>1265</td>
<td>1332</td>
<td>1588</td>
</tr>
</tbody>
</table>

S.E. of any margin 1 mean in N X P or S X P table = 117.2 lb./ac.
S.E. of marginal mean of N in N X S table = 77.8 lb./ac.
S.E. of marginal mean of S in N X S table = 65.5 lb./ac.
S.E. of body of N X P or S x P table = 117.2 lb./ac.
S.E. of body of N X S table = 110.2 lb./ac.
S.E. of extra treatments = 117.2 lb./ac.

---

Crop :- Wheat.  Ref :- Complex experiments (T.C.M.), 1953.
Centre :- Satna (M.P.).  Type :- 'M'.

Object :- II To study the best time of application of N,

1. **BASAL CONDITIONS:**

2. **TREATMENTS:**
All combinations of (1) and (2)+one control.
(i) 3 sources of N at 20 lb./ac. : S_1=A/S, S_2=Urea and S_3=A/N.
(ii) 2 times of application : T_1=at sowing and T_2=at first irrigation.

3. **DESIGN:**
(i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 40'x27'. (v) N.A. (vi) Yes.

4. **GENERAL:**
(i) Normal. (ii) Crop suffered by brown-rust and drought. (iii) Grain yield. (iv) (a) 1953-56. (b) No. (c) N.A. (v) (a) Kotah, Banaras, Pura, Niphad and Palnad. (b) N.A. (vi) Nil. (vii) Nil.

5. **RESULTS:**
(i) 385 lb./ac. (ii) 76.49 lb./ac. (iii) None of the effects is significant.
Crop: Wheat  
Ref: Simple trials on cultivator's fields (T.C.M.), 1953. 
Centre: Hoshangabad (M.P.)  
Type: ‘M’

Object: To study the effect of manures (N,P.)

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) N.A. (c) N.A. (ii) Deep black-heavy clay pH 8.0 (iii) Nil (iv) Nil (v) N.A.  
   (vi) October-November (vii) Unirrigated (viii) N.A. (ix) N.A.  
   (x) March-April.

2. TREATMENTS:
   O=Control
   N=A/S at 20 lb./ac. of N. 
   NP=A/S at 20 lb./ac. of N+Super at 20 lb./ac. of P2O5. 
   N’P=Urea at 20 lb./ac. of N+Super at 10 lb./ac. of P2O5.

3. DESIGN:
   (i) & (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one de elopment block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL:
   (i) Normal, (ii) Nil, (iii) Grain yield. (iv) (a) 1953-56, (b) No, (c) N.A. (v) N.A.  
   (vi) Nil, (vii) Nil.

5. RESULTS:
   Treatment  | Av. yield in lb./ac.
   --- | ---
   0 | 550
   N | 615
   NP | 613
   N’P | 583
   G.M. | 599
   S.E./mean | = 19.42 lb./ac.
   No. of experiments | 40

Crop: Wheat  
Ref: Simple trials on cultivator's fields (T.C.M.), 1953 
Centre: Hoshangabad (M.P.)  
Type: ‘M’

Object: To study the effect of A/S with different sources of P.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) N.A. (c) N.A. (ii) Deep black-heavy clay-pH 8.0 (iii) Nil (iv) Nil (v) N.A.  
   (vi) October-November. (vii) Unirrigated. (viii) N.A. (ix) N.A.  
   (x) March-April.
2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>464</td>
</tr>
<tr>
<td>N</td>
<td>540</td>
</tr>
<tr>
<td>NP</td>
<td>598</td>
</tr>
<tr>
<td>NP'</td>
<td>562</td>
</tr>
<tr>
<td>NP''</td>
<td>563</td>
</tr>
<tr>
<td>G.M.</td>
<td>546</td>
</tr>
</tbody>
</table>

S.E./mean = 17.03 lb./ac.
No. of experiments = 40

Centre: Hoshangabad (M.P.) Type: 'M'.

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

1. BASAL CONDITIONS:


2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>596</td>
</tr>
<tr>
<td>N</td>
<td>672</td>
</tr>
<tr>
<td>N'</td>
<td>651</td>
</tr>
<tr>
<td>N''</td>
<td>680</td>
</tr>
<tr>
<td>N'</td>
<td>686</td>
</tr>
<tr>
<td>G.M.</td>
<td>657</td>
</tr>
</tbody>
</table>

S.E./mean = 33.82 lb./ac.
No. of experiments = 22

3. DESIGN:

(i) & (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL:

(i) Normal (ii) Nil (iii) Grain yield (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>596</td>
</tr>
<tr>
<td>N</td>
<td>672</td>
</tr>
<tr>
<td>N'</td>
<td>651</td>
</tr>
<tr>
<td>N''</td>
<td>680</td>
</tr>
<tr>
<td>N'</td>
<td>686</td>
</tr>
<tr>
<td>G.M.</td>
<td>657</td>
</tr>
</tbody>
</table>

S.E./mean = 33.82 lb./ac.
No. of experiments = 22

Centre: Hoshangabad (M.P.) Type: 'M'.

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

1. BASAL CONDITIONS:

Crop :- Wheat. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Hoshangabad (M.P.). Type :- 'M'.

Object :- I (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :

2. TREATMENTS :
   0 = Control.
   \( N_1 \) = A/N at 20 lb./ac. of N.
   \( N_2 \) = A/N at 40 lb./ac. of N.
   \( N_3 \) = Urea at 20 lb./ac. of N.
   \( N_4 \) = Urea at 40 lb./ac. of N.

3. DESIGN :
   (i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :

5. RESULTS :

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>546</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>567</td>
</tr>
<tr>
<td>( N_2 )</td>
<td>566</td>
</tr>
<tr>
<td>( N_3 )</td>
<td>513</td>
</tr>
<tr>
<td>( N_4 )</td>
<td>485</td>
</tr>
<tr>
<td>G.M.</td>
<td>532</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 39.00 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>10</td>
</tr>
</tbody>
</table>

Crop :- Wheat. Ref :- Simple trials on cultivators' Fields (T.C.M.), 1953.
Centre :- Hoshangabad (M.P.). Type :- 'M'.

Object :- I. (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) Deep black, heavy clay pH=7.0. (iii) Nil. (iv) N.A. (v) N.A. (vi) October-November. (vii) Unirrigated. (viii) and (ix) N.A. (x) March-April.

2. TREATMENTS :
   0 = Control.
   \( N_1 \) = A/S at 20 lb./ac. of N.
   \( N_2 \) = A/S at 40 lb./ac. of N.
   \( N_3 \) = A/N at 20 lb./ac. of N.
   \( N_4 \) = A/N at 40 lb./ac. of N.

3. DESIGN :
   (i) and (ii) Eleven community project centres, representing the entire wheat growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing wheat for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL :
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953-1956. (b) No. (c) N.A. (x) N.A. (vi) and (vii) Nil.
RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>586</td>
</tr>
<tr>
<td>N1</td>
<td>694</td>
</tr>
<tr>
<td>N2</td>
<td>721</td>
</tr>
<tr>
<td>N'1</td>
<td>644</td>
</tr>
<tr>
<td>N'2</td>
<td>647</td>
</tr>
<tr>
<td>G.M.</td>
<td>658</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>28.88 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>17</td>
</tr>
</tbody>
</table>


Object: To study the effect of manures (N, P, K).

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) Red and yellow—clay loam pH 7.0. (iii) to (v) N.A. (vi) June. (vii) Unirrigated. (viii) N.A. (ix) 50". (x) October-November.

2. TREATMENTS:
   0 = Control.
   N = A/S at 20 lb./ac. of N.
   NP = A/S at 20 lb./ac. of N + Super at 20 lb./ac. of P2O5.
   N'P = A/N at 20 lb./ac. of N + Super at 20 lb./ac. of P2O5.
   N'P' = Urea at 20 lb./ac. of N + Super at 20 lb./ac. of P2O5.
   P = Super at 20 lb./ac. of P2O5.
   Fertilizers broadcast after cultivation operation.

3. DESIGN:
   (i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1'556. (b) N.A. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1315</td>
</tr>
<tr>
<td>N</td>
<td>1724</td>
</tr>
<tr>
<td>NP</td>
<td>1867</td>
</tr>
<tr>
<td>N'P</td>
<td>1618</td>
</tr>
<tr>
<td>N'P'</td>
<td>1869</td>
</tr>
<tr>
<td>P</td>
<td>1567</td>
</tr>
<tr>
<td>G.M.</td>
<td>1660</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>72.41 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>29</td>
</tr>
</tbody>
</table>


Object: To study the effect of types and levels of P and N.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) N.A. (c) N.A. (ii) Red and yellow—clay loam pH 7.0. (iii) Nil (iv) N.A. (v) N.A. (vi) June (vii) Unirrigated (viii) N.A. (ix) 50" (x) October-November.
2. TREATMENTS:

0 = Control.
N = A/S at 40 lb./ac. of N.
NP = A/S at 40 lb./ac. of N + Super at 20 lb./ac. of P_2O_5.
NP' = A/S at 40 lb./ac. of N + Super at 20 lb./ac. of P_2O_5.
NP'' = A/S at 40 lb./ac. of N + N tr. Phos. at 20 lb./ac. of P_2O_5.
NP''' = A/S at 40 lb./ac. of N + Ammo. Phos. at 20 lb./ac. of P_2O_5.

Fertilizers applied broadcast after bari operation.

3. DESIGN:

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. Each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL:

(i) Normal (ii) Nil (iii) Grain yield (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) N/A (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Avg. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1402</td>
</tr>
<tr>
<td>N</td>
<td>2281</td>
</tr>
<tr>
<td>NP</td>
<td>2412</td>
</tr>
<tr>
<td>NP'</td>
<td>2539</td>
</tr>
<tr>
<td>NP''</td>
<td>2211</td>
</tr>
<tr>
<td>NP'''</td>
<td>2521</td>
</tr>
<tr>
<td>G.M.</td>
<td>2194</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>120.1 lb./ac.</td>
</tr>
<tr>
<td>No. of exps</td>
<td>10</td>
</tr>
</tbody>
</table>

Crop: Paddy (1st crop)  
Ref: Simple trials on cultivators’ fields (T.C.M.) 1953.  
Centre: Raipur (M.P.) Block I  
Object: (i) Normal (ii) Nil (iii) Grain yield (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) N/A (vii) Nil.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) N.A. (c) N.A. (d) N.A. (e) Red and yellow—clay loam pH 7.0 (ii) Nil (iv) N.A. (v) N.A. (vi) June (vii) Unirrigated (viii) N.A. (ix) 50° (x) October—November.

2. TREATMENTS:

0 = Control.
N = A/S at 40 lb./ac. of N.
NP = A/S at 40 lb./ac. of N + Super at 20 lb./ac. of P_2O_5.
NP' = A/S at 40 lb./ac. of N + Super at 20 lb./ac. of P_2O_5.
NP'' = A/S at 40 lb./ac. of N + N tr. Phos. at 20 lb./ac. of P_2O_5.
NP''' = A/S at 40 lb./ac. of N + Ammo. Phos. at 20 lb./ac. of P_2O_5.

Fertilizers applied broadcast after bari operation.

3. DESIGN:

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL:

(i) Normal (ii) Nil (iii) Grain yield (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) N/A (vii) Nil.
5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>167</td>
</tr>
<tr>
<td>N</td>
<td>16'6</td>
</tr>
<tr>
<td>NP₁</td>
<td>1886</td>
</tr>
<tr>
<td>NP₂</td>
<td>2020</td>
</tr>
<tr>
<td>NP₁₁</td>
<td>1879</td>
</tr>
<tr>
<td>NP₂₁</td>
<td>19'9</td>
</tr>
<tr>
<td>G.M.</td>
<td>1765</td>
</tr>
<tr>
<td>S.E. mean</td>
<td>111.1 lb./ac.</td>
</tr>
<tr>
<td>No. of Expts.</td>
<td>10</td>
</tr>
</tbody>
</table>

CROP: Paddy (1st crop). Ref: Simple trials on cultivators' fields (T.C.M.) 1953.
Centre: Raipura (M.P.) Block I. Type: 'M'.

Object: (i) To study the effects of types and levels of P and N.

1. BASAL CONDITIONS:

(i) a) to (c) N.A.
(ii) Red and yellow-Clay loam-pH 7.0.
(iii) Nil.
(iv) N.A.
(v) N.A.
(vi) June.
(vii) Unirrigated.
(viii) N.A. (ix) 50'. (x) October-November.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Control</td>
</tr>
<tr>
<td>NP₁</td>
<td>A/S at 40 lb./ac.</td>
</tr>
<tr>
<td>NP₁₁</td>
<td>A/S at 40 lb./ac.</td>
</tr>
<tr>
<td>NP₂</td>
<td>A/S at 40 lb./ac.</td>
</tr>
<tr>
<td>NP₂₁</td>
<td>A/S at 40 lb./ac.</td>
</tr>
<tr>
<td>Fertilizers broadcast after bias operational.</td>
<td></td>
</tr>
</tbody>
</table>

3. DESIGN:

(i) Normal.
(ii) Nil.
(iii) Grain yield.
(iv) (a) 1953-1956.
(b) No.
(c) N.A.
(v) N.A.
(vi) Nil.
(vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1328</td>
</tr>
<tr>
<td>N</td>
<td>2048</td>
</tr>
<tr>
<td>NP₁</td>
<td>1900</td>
</tr>
<tr>
<td>NP₁₁</td>
<td>2036</td>
</tr>
<tr>
<td>NP₂</td>
<td>2032</td>
</tr>
<tr>
<td>NP₂₁</td>
<td>2261</td>
</tr>
<tr>
<td>G.M.</td>
<td>1949</td>
</tr>
<tr>
<td>S.E. mean</td>
<td>108.6 lb./ac.</td>
</tr>
<tr>
<td>No. of Expts.</td>
<td>10</td>
</tr>
</tbody>
</table>

CROP: Paddy (1st crop). Ref: Simple trials on cultivators' fields (T.C.M.) 1953.
Centre: Raipura (M.P.) Block I. Type: 'M'.

Object: (i) To study the effect of different levels and sources of N.
2. TREATMENTS:

0 = Control.
N₁ = A/S at 20 lb./ac. of N.
N₂ = A/S at 40 lb. ac. of N.
Fertilizers broadcast after blind operation.

3. DESIGN:

(i) to (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL:


5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1447</td>
</tr>
<tr>
<td>N₁</td>
<td>1844</td>
</tr>
<tr>
<td>N₂</td>
<td>1943</td>
</tr>
<tr>
<td>G.M.</td>
<td>1745</td>
</tr>
<tr>
<td>N₂</td>
<td>89.68 lb./ac.</td>
</tr>
<tr>
<td>No. of Expts.</td>
<td>11</td>
</tr>
</tbody>
</table>

Centre: Raipur (M.P.) Block I. Type: ‘MP’.
Object: – (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITION:

(i) to (c) N.A. (iv) Red and yellow Clay loam. pH 7.3. (v) Nil. (vi) N.A. (vii) June.

2. TREATMENTS:

0 = Control.
N₁ = A/S at 20 lb./ac. of N.
N₂ = A/S at 40 lb. ac. of N.
N₂ = Urea at 20 lb. ac. of N.
N₂ = Urea at 40 lb. ac. of N.
Fertilizers broadcast after blind operation.

3. DESIGN:

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL:


5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1322</td>
</tr>
<tr>
<td>N₁</td>
<td>1544</td>
</tr>
<tr>
<td>N₂</td>
<td>1959</td>
</tr>
<tr>
<td>N₂</td>
<td>1923</td>
</tr>
<tr>
<td>N₂</td>
<td>1785</td>
</tr>
<tr>
<td>G.M.</td>
<td>1701</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>100.4 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>12</td>
</tr>
</tbody>
</table>
Crop :- Paddy (1st crop). Ref :- Simple trials on cultivators' fields (T.C.M.) 1953.
Centre :- Raipur (M.P.) Block II. Type :- ‘M’.

Object :- I (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) Red and yellow—Clay loam pH 7.0 (iii) Nil. (iv) and (v) N.A. (vi) June (vii) Unirrigated. (viii) N.A. (ix) 50°. (x) Oct-Nov.

2. TREATMENTS:
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1329</td>
</tr>
<tr>
<td>N₁</td>
<td>1629</td>
</tr>
<tr>
<td>N₂</td>
<td>1781</td>
</tr>
<tr>
<td>G.M.</td>
<td>1580</td>
</tr>
</tbody>
</table>

S.E./mean =63.35 lb./ac.
No. of expts. 9

Crop :- Paddy. Ref :- Simple trials on cultivators' fields (T.C.M.), 1953.
Centre :- Raipur (M.P.) Block II. Type :- ‘M’.

Object :- I. (a) (ii) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) Red and yellow clay loam pH 7.0. (iii) Nil. (iv) and (v) N.A. (vi) June. (vii) Unirrigated. (viii) N.A. (ix) 50°. (x) October-November.

2. TREATMENTS:
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1329</td>
</tr>
<tr>
<td>N₁</td>
<td>1629</td>
</tr>
<tr>
<td>N₂</td>
<td>1781</td>
</tr>
<tr>
<td>G.M.</td>
<td>1580</td>
</tr>
</tbody>
</table>

S.E./mean =63.35 lb./ac.
No. of expts. 9

3. DESIGN:
(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL:

PET RESULTS:

Treatment Av. yield
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1329</td>
</tr>
<tr>
<td>N₁</td>
<td>1629</td>
</tr>
<tr>
<td>N₂</td>
<td>1781</td>
</tr>
<tr>
<td>G.M.</td>
<td>1580</td>
</tr>
</tbody>
</table>

S.E./mean =63.35 lb./ac.
No. of expts. 9
Site: Raipur (M.P.) Block II, Type: 'NP'.
Object: (i) To study the effect of different levels and sources of N.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (d) Red and yellow clay from pH 7.0. (e) Nil. (f) June. (g) Unirrigated. (h) N.A. (i) 0. (j) October - November.

2. TREATMENTS:
0 = Control.
N = A/S at 20 lb./ac. of N.
P = Super at 0 lb./ac. of P2O5.
Np = A/S at 20 lb./ac. of N + Super at 20 lb./ac. of P2O5.
Np = A/N at 20 lb./ac. of N + Super at 20 lb./ac. of P2O5.
Np = Urea at 20 lb./ac. of N + Super at 20 lb./ac. of P2O5. Fertiliser broadcast after final operation.

3. DESIGN:
(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the county were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and out of these, one belonging to each was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL:
(i) No. (ii) Nil. (iii) Grain yield. (iv) (a) 1953 - 1955. (b) No. (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1571</td>
</tr>
<tr>
<td>N</td>
<td>1849</td>
</tr>
<tr>
<td>P</td>
<td>1332</td>
</tr>
<tr>
<td>NP</td>
<td>137.7</td>
</tr>
<tr>
<td>N P</td>
<td>1240</td>
</tr>
<tr>
<td>N P</td>
<td>10.18</td>
</tr>
<tr>
<td>G.M.</td>
<td>15.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>62.36 lb./ac.</td>
</tr>
<tr>
<td>No. of experiments</td>
<td>27</td>
</tr>
</tbody>
</table>

Site: Raipur (M.P.) Block II, Type: 'NP'.
Object: (i) (a) N.A. (b) N. A. (c) N. A. (d) Red and yellow clay from pH 7.0. (e) Nil. (f) N.A. (g) N.A. (h) June. (i) Unirrigated. (j) N.A. (k) 50° (l) October - November.
2. TREATMENTS:

0 = Control.
N1 = A/S at 20 lb./ac. of N.
N2 = A/S at 40 lb./ac. of N.
N*1 = Urea at 20 lb./ac. of N.
N*2 = Urea at 40 lb./ac. of N.

Fertilizers broadcast after bias operation.

3. DESIGN:

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random. Each field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (ii) N.A. (iv) Yes.

4. GENERAL:

(i) Normal (ii) Nil (iii) Grain yield (iv) (a) 1953-56 (b) No (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1175</td>
</tr>
<tr>
<td>N1</td>
<td>1675</td>
</tr>
<tr>
<td>N2</td>
<td>1677</td>
</tr>
<tr>
<td>G.M.</td>
<td>1551</td>
</tr>
</tbody>
</table>

S.E./mean = 153.0 lb./ac.
No. of expts. = 8

Crop: Paddy. Ref: Simple trials on cultivators' fields (T.C.M.), 1953.
Centre: Raipur (M.P.) Block II. Type: 'M'.

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

1. BASAL CONDITIONS:


2. TREATMENTS:

0 = Control.
N1 = A/S at 20 lb./ac. of N.
N2 = A/S at 40 lb./ac. of N.

Fertilizers broadcast after bias operation.

3. DESIGN:

(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL:

(i) Normal (ii) Nil (iii) Grain yield (iv) (a) 1953-1956. (b) No. (c) N.A. (v) N.A. (vi) Nil. (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1303</td>
</tr>
<tr>
<td>N1</td>
<td>1675</td>
</tr>
<tr>
<td>N2</td>
<td>1677</td>
</tr>
<tr>
<td>G.M.</td>
<td>1551</td>
</tr>
</tbody>
</table>

S.E./mean = 153.0 lb./ac.
No. of expts. = 8
Crop: Paddy.  
Ref: Simple trials on cultivators' fields (T.C.M.), 1953.
Centre: Raipur (M.P.) Block II.  
Type: 'M'.

Object: - IV (i) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) Red and yellow - Clay loam pH 7.0.  (iii) Nil.  (iv) and (v) N.A.  (vi) June.  (vii) Unirrigated.  (viii) N.A.  (ix) 50°.  (x) October-Nov.

2. TREATMENTS:
   0 = Control.  
   N = A/S at 40 lb./ac. of N.  
   NP1 = A/S at 40 lb./ac. of N + Super at 20 lb./ac. of P2O5.  
   NP2 = A/S at 40 lb./ac. of N + Super at 40 lb./ac. of P2O5.  
   NP'1 = A/S at 40 lb./ac. of N + Nitro. Phos at 20 lb./ac. of P2O5.  
   NP'2 = A/S at 40 lb./ac. of N + Nitro. Phos at 40 lb./ac. of P2O5.  
   Fertilizers broadcast after blad operation.

3. DESIGN:
   (i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From eachcommunity project centre, one development block was selected. Villages were selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one l'd each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A.  (iv) Nil.

4. GENERAL:
   (i) Normal.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1953-1956.  (b) No.  (c) N.A.  (v) N.A.  (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield (lb./ac.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1013</td>
</tr>
<tr>
<td>N</td>
<td>1553</td>
</tr>
<tr>
<td>NP1</td>
<td>1978</td>
</tr>
<tr>
<td>NP2</td>
<td>1583</td>
</tr>
<tr>
<td>NP'1</td>
<td>1304</td>
</tr>
<tr>
<td>NP'2</td>
<td>1868</td>
</tr>
<tr>
<td>G.M.</td>
<td>1550</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>221.3</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>8</td>
</tr>
</tbody>
</table>

---

Crop: Paddy.  
Ref: Simple trials on cultivators' fields (T.C.M.), 1953. 
Centre: Raipur (M.P.) Block II.  
Type: 'M'.

Object: - IV (ii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) Red and yellow - Clay loam pH 7.0.  (iii) Nil.  (iv) and (v) N.A.  (vi) June.  (vii) Unirrigated.  (viii) N.A.  (ix) 50°.  (x) October-Nov.

2. TREATMENTS:
   0 = Control.  
   N = A/S at 40 lb./ac.  
   NP1 = A/S at 40 lb./ac. of N + Super at 20 lb./ac. of P2O5.  
   NP2 = A/S at 40 lb./ac. of N + Super at 40 lb./ac. of P2O5.  
   NP'1 = A/S at 40 lb./ac. of N + Nitro. Phos at 20 lb./ac. of P2O5.  
   NP'2 = A/S at 40 lb./ac. of N + Nitro. Phos at 40 lb./ac. of P2O5.  
   Fertilizers broadcast after blad operation.

3. DESIGN:
   (i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were
selected at random from the selected block and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out. (iii) N.A. (iv) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) 1953—1956. (b) No. (c) N.A. (d) N.A. (v) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>879</td>
</tr>
<tr>
<td>N</td>
<td>1376</td>
</tr>
<tr>
<td>NP_1</td>
<td>1631</td>
</tr>
<tr>
<td>NP_2</td>
<td>1685</td>
</tr>
<tr>
<td>NP^*_1</td>
<td>1558</td>
</tr>
<tr>
<td>NP^*_2</td>
<td>1591</td>
</tr>
<tr>
<td>G.M.</td>
<td>1453</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 107.8 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>9</td>
</tr>
</tbody>
</table>

Crop :- Paddy. Ref :- Simple trials on cultivators’ fields (T.C.M.) 1953. Centre :- Raipura (M.P.) (Block II). Type :- ‘M’.

Object :- IV (iii) To study the effect of types and levels of P and N.

1. BASAL CONDITIONS:

2. TREATMENTS:
0 = Control.
NP_1 = A/S 40 lb./ac. of N.
NP^*_2 = A/S 40 lb./ac. + Nitro. Phos at 20 lb./ac. of P_2O_5.
NP^*_2 = A/S 40 lb./ac. + Nitro. Phos at 40 lb./ac. of P_2O_5.
NP^*_2 = A/S 40 lb./ac. + Ammo. Phos at 20 lb./ac. of P_2O_5.
NP^*_2 = A/S 40 lb./ac. + Ammo. Phos at 40 lb./ac. of P_2O_5.
Fertilizers broadcast after blast operation.

3. DESIGN:
(i) and (ii) Eleven community project centres, representing the entire paddy growing tract of the country, were selected. From each community project centre, one development block was selected. Villages were selected at random from the selected blocks and a list of cultivators growing paddy for each selected village was prepared. From this list, two cultivators were selected at random and one field each belonging to them was taken for trial. In each selected field an unreplicated trial was laid out (iii) N.A. (iv) Yes.

4. GENERAL:

5. RESULTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Av. yield in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>871</td>
</tr>
<tr>
<td>N</td>
<td>1182</td>
</tr>
<tr>
<td>NP^*_1</td>
<td>1231</td>
</tr>
<tr>
<td>NP^*_2</td>
<td>1244</td>
</tr>
<tr>
<td>NP^*_2</td>
<td>1205</td>
</tr>
<tr>
<td>NP^*_2</td>
<td>1307</td>
</tr>
<tr>
<td>G. M.</td>
<td>1173</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 95.44 lb./ac.</td>
</tr>
<tr>
<td>No. of expts.</td>
<td>10</td>
</tr>
</tbody>
</table>
Object: To find out suitable seed rate for Wheat.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) Black cotton soil. (d) N.A. (ii) 3, 4, 11, 1948. (iv) (a) N.A. (b) Drilled. (c) As per treatments. (d) N.A. (e) — (v) N.A. (f) C. 591. (vii) to (ix) N.A. (xi) 27, 28, 3, 1949.

2. TREATMENTS:
4 seed rates: R1 = 30, R2 = 40, R3 = 50, R4 = 60, and R5 = 70 srs/ac.

3. DESIGN:
(i) R.B.D. (ii) 8 (4 plots for each treatment). (b) N.A. (iii) S. (a) and (b) 7: 4: 3: 4. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (vii) to (ix) N.A.

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


Object: To ascertain which seed rate gives highest yield under local conditions.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Paddy. (c) N.A. (d) Cultivation analysis, Bagwai. (ii) 2.11.1949. (iv) (a) 1st ploughed by Chananal plough. Twice ploughed by desi plough. (v) N.A. (vi) As per treatment. (vii) N.A. (viii) F.Y.M. applied. (ix) Balsabhandi (local). (x) Irrigated. (xi) Weeding. (xii) 7:41. (iv) N.A.

2. TREATMENTS:
5 seed rates: R1 = 30, R2 = 40, R3 = 50, R4 = 60, and R5 = 70 srs/ac.

3. DESIGN:
(i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 73° x 22°. (b) 72° x 20°. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) N.A. (vi) and (vii) N.A.

5. RESULTS:
(i) 571.9 lb/ac.
(ii) 42.7 lb/ac.

Crop:— Wheat. Site:— Harsai Exptl. Farm, Bagwai. Ref:— M. I'. 49(29).

Object:— To ascertain which seed rate gives highest yield under local conditions.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) N.A. (d) Cultivation analysis, Bagwai. (ii) 2.11.1949. (iv) (a) 1st ploughed by Chananal plough. Twice ploughed by desi plough. (v) N.A. (vi) As per treatment. (vii) N.A. (viii) F.Y.M. applied. (ix) Balsabhandi (local). (x) Irrigated. (xi) Weeding. (xii) 7:41. (iv) N.A.

2. TREATMENTS:
5 seed rates: R1 = 30, R2 = 40, R3 = 50, R4 = 60, and R5 = 70 srs/ac.

3. DESIGN:
(i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 73° x 22°. (b) 72° x 20°. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) N.A. (vi) and (vii) N.A.

5. RESULTS:
(i) 571.9 lb/ac.
(ii) 42.7 lb/ac.

Crop:— Wheat. Site:— Harsai Exptl. Farm, Bagwai. Ref:— M. I'. 49(29).

Object:— To ascertain which seed rate gives highest yield under local conditions.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) N.A. (d) Cultivation analysis, Bagwai. (ii) 2.11.1949. (iv) (a) 1st ploughed by Chananal plough. Twice ploughed by desi plough. (v) N.A. (vi) As per treatment. (vii) N.A. (viii) F.Y.M. applied. (ix) Balsabhandi (local). (x) Irrigated. (xi) Weeding. (xii) 7:41. (iv) N.A.

2. TREATMENTS:
5 seed rates: R1 = 30, R2 = 40, R3 = 50, R4 = 60, and R5 = 70 srs/ac.

3. DESIGN:
(i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 73° x 22°. (b) 72° x 20°. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) N.A. (vi) and (vii) N.A.

5. RESULTS:
(i) 571.9 lb/ac.
(ii) 42.7 lb/ac.

Crop:— Wheat. Site:— Harsai Exptl. Farm, Bagwai. Ref:— M. I'. 49(29).

Object:— To ascertain which seed rate gives highest yield under local conditions.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) N.A. (d) Cultivation analysis, Bagwai. (ii) 2.11.1949. (iv) (a) 1st ploughed by Chananal plough. Twice ploughed by desi plough. (v) N.A. (vi) As per treatment. (vii) N.A. (viii) F.Y.M. applied. (ix) Balsabhandi (local). (x) Irrigated. (xi) Weeding. (xii) 7:41. (iv) N.A.

2. TREATMENTS:
5 seed rates: R1 = 30, R2 = 40, R3 = 50, R4 = 60, and R5 = 70 srs/ac.

3. DESIGN:
(i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) 73° x 22°. (b) 72° x 20°. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) N.A. (vi) and (vii) N.A.

5. RESULTS:
(i) 571.9 lb/ac.
(ii) 42.7 lb/ac.

Crop:— Wheat. Site:— Harsai Exptl. Farm, Bagwai. Ref:— M. I'. 49(29).

Object:— To ascertain which seed rate gives highest yield under local conditions.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) N.A. (d) Cultivation analysis, Bagwai. (ii) 2.11.1949. (iv) (a) 1st ploughed by Chananal plough. Twice ploughed by desi plough. (v) N.A. (vi) As per treatment. (vii) N.A. (viii) F.Y.M. applied. (ix) Balsabhandi (local). (x) Irrigated. (xi) Weeding. (xii) 7:41. (iv) N.A.
Crop: Wheat (Rabi).
Site: Govt. Exptl. Farm, Chindwara.

Object: To find out suitable stage for Wheat crop for harvesting in order to avoid damage due to hail storm.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 17.11.1951. (iv) (a) to (e) N.A. (v) N.A. (vi) A.O. 92.
   (vii) Irrigated. (viii) N.A. (ix) N.A. (x) As per treatments.

2. TREATMENTS:
   1. Harvesting at milk stage on 19.3.1952.
   2. Harvesting 10 days after milk stage on 29.3.1952.
   3. Harvesting at dry cake stage on 8.4.1952.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) to (b) 1/80 ac. (v) Nil. (vi) Yes.

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

5. RESULTS:
   (i) 604.1 lb./ac.
   (ii) 78.4 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

   Treatment | Av. yield | S.E./mean
   1.         | 599.7     | 32.06 lb./ac.
   2.         | 646.2     |
   3.         | 566.4     |

Crop: Wheat.
Site: Central Res. Farm, Gwalior.

Object: To find out the optimum seed rate and spacing for Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Sannhemp for G.M. (c) Nil. (ii) (a) Sandy loam. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) Seeds drilled. (c) and (c) As per treatments. (e) N.A. (v) Sannhemp as G.M. (vi) N.P. 710. (vii) Unirrigated. (viii) N.A. (ix) 2.13". (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   3 spacings: S1=9", S2=12" and S3=15".

   Sub-plot treatments:
   5 seed rates: R1=33, R2=35, R3=40, R4=45 and R5=50 seed/ac.

3. DESIGN:
   (i) Split plot. (ii) (a) 3 main plots/block and 5 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 3'x15'. (v) One row on both sides and 1' of each row at both ends. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1953 to 1954. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 811.2 lb./ac.
   (ii) 157.8 lb./ac.
   (b) 243.2 lb./ac.
   (iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>R₅</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>970.9</td>
<td>725.7</td>
<td>970.7</td>
<td>916.4</td>
<td>641.3</td>
<td>865.0</td>
</tr>
<tr>
<td>S₂</td>
<td>780.4</td>
<td>732.0</td>
<td>849.9</td>
<td>762.1</td>
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<td>788.3</td>
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<tr>
<td>S₃</td>
<td>788.1</td>
<td>753.1</td>
<td>799.1</td>
<td>780.4</td>
<td>837.8</td>
<td>779.7</td>
</tr>
<tr>
<td>Mean</td>
<td>839.8</td>
<td>770.3</td>
<td>859.0</td>
<td>819.6</td>
<td>766.2</td>
<td>811.2</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. marginal means of S
   = 49.90 lb./ac.
2. marginal means of R
   = 9.24 lb./ac.
3. R means at the same level of S
   = 17.9 lb./ac.
4. S means at the same level of R
   = 16.7 lb./ac.

---

Crop: Wheat.
Site: Institute of Plant Industry, Indore.
Ref: M.P. 48(9).
Type: 'C'.

Object: To find out suitable spacing and economic seed rate for unirrigated Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 20, 21.10.1948. (iv) (a) Basnagar. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) 20 lb./ac. of N as G.N.C. applied a fortnight before sowing in 2 blocks, while in the other two blocks just before sowing. 2 blocks manured. (vi) Malvi E.K.D. (vii) Unirrigated. (viii) Weeding, hoeing. (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 spacings: S₁=9" and S₂=14".
   (2) 5 seed rates: R₁=40, R₂=60, R₃=80, R₄=100 and R₅=120 lb./ac.

3. DESIGN:
   (i) 2x5 Facc. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 60'x16'. (b) 55'x11'8". (v) 2 rows for 14" spacing and 3 rows for 9" spacing on both sides and 2' of each row at both ends. (vi) N.A.

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

5. RESULTS:
   (i) 783.6 lb./ac.
   (ii) 710.2 lb./ac.
   (iii) Only R effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>R₅</th>
<th>Mean</th>
</tr>
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<tr>
<td>S₁</td>
<td>912.0</td>
<td>950.2</td>
<td>735.3</td>
<td>615.8</td>
<td>661.0</td>
<td>771.9</td>
</tr>
<tr>
<td>S₂</td>
<td>917.7</td>
<td>905.9</td>
<td>731.7</td>
<td>771.3</td>
<td>635.6</td>
<td>792.4</td>
</tr>
<tr>
<td>Mean</td>
<td>914.8</td>
<td>927.5</td>
<td>733.5</td>
<td>691.6</td>
<td>683.3</td>
<td>733.6</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of R = 49.14 lb./ac.
S.E. of marginal mean of S = 31.08 lb./ac.
S.E. of body of table = 69.49 lb./ac.
Crop :- Wheat (Rabi).

Site :- Institute of Plant Industry, Indore.

Object :- To find out optimum spacing and economic seed rate for unirrigated Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 5.11.1949. (iv) (a) Bakharing and ploughing. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) Out of 6 blocks, 2 blocks were manured with 20 lb./ac. of N as G.N.C. a fortnight before sowing; 2 blocks manured with 20 lb./ac. of N as G.N.C. just before sowing. The remaining two blocks were not manured. (vi) Malvi E.K.D. (vii) Unirrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 spacings: $S_1=9'$ and $S_2=14'$.
   (2) 5 seed rates: $R_1=40$, $R_2=60$, $R_3=80$, $R_4=100$ and $R_5=120$ lb./ac.

3. DESIGN:
   (i) $2 \times 5$ Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) $11^\prime 8^\prime \times 45^\prime$. (v) N.A. (vi) Yes.

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

5. RESULTS:
   (i) 776.6 lb./ac.
   (ii) 109.8 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$R_1$</th>
<th>$R_2$</th>
<th>$R_3$</th>
<th>$R_4$</th>
<th>$R_5$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>783.0</td>
<td>812.2</td>
<td>706.7</td>
<td>804.4</td>
<td>682.6</td>
<td>757.8</td>
</tr>
<tr>
<td>$S_2$</td>
<td>836.4</td>
<td>805.2</td>
<td>737.9</td>
<td>807.0</td>
<td>790.6</td>
<td>795.4</td>
</tr>
<tr>
<td>Mean</td>
<td>809.7</td>
<td>808.7</td>
<td>722.3</td>
<td>805.7</td>
<td>736.6</td>
<td>776.6</td>
</tr>
<tr>
<td>S.E.</td>
<td>31.69</td>
<td>lb./ac.</td>
<td>20.04</td>
<td>lb./ac.</td>
<td>44.81</td>
<td>lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.

Site :- Institute of Plant Industry, Indore.

Object :- To find out the optimum seed rate and spacing for Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) and (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) E.K.D. Malvi. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 spacings: $S_1=9'$ and $S_2=14'$.
   (2) 5 seed rates: $R_1=40$, $R_2=60$, $R_3=80$, $R_4=100$ and $R_5=120$ lb./ac.

3. DESIGN:
   (i) $2 \times 5$ Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) $47^\prime \times 10.4^\prime$. (b) $45^\prime \times 9.4^\prime$. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) N.A. (b) and (c) No. (v) (a) No. (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) $51.2 \text{ lb/acre}$.
(ii) $15.0 \text{ lb/acre}$.
(iii) Only S effect is significant.
(iv) Av. yield of grain in lb/acre.

<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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>520.5</td>
<td>426.6</td>
<td>460.1</td>
<td>492.4</td>
<td>465.5</td>
<td>473.0</td>
</tr>
<tr>
<td>$S_2$</td>
<td>428.7</td>
<td>405.0</td>
<td>396.4</td>
<td>451.4</td>
<td>465.5</td>
<td>429.4</td>
</tr>
<tr>
<td>Mean</td>
<td>474.6</td>
<td>415.8</td>
<td>428.2</td>
<td>471.9</td>
<td>466.5</td>
<td>451.2</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of $R$ = 44.7 lb/acre.
S.E. of marginal mean of $S$ = 28.1 lb/acre.
S.E. of body of table = 61.2 lb/acre.


Object: To study the effect of different spacings and different seed rates on irrigated Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 17,18,11 1948. (iv) (a) Rat hung. (b) N.A. (c)

2. TREATMENTS:
All combinations of (1) and (2)
1. 2 rows: $S_1=9'$ and $S_2=14'$.
2. 5 seed rates: $R_1=40$, $R_2=60$, $R_3=80$, $R_4=100$ and $R_5=120$ lb/acre.

3. DESIGN:
(i) 2 x 5. Fact. in R, B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 11 $8'\times 40'$, (b) $7'\times 35'$. (v) 2 rows for 14" spacing and 3 rows for 9" spacing on both sides and $1\frac{1}{2}$" each at both the ends.

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

5. RESULTS:
(i) 1861 lb/acre.
(ii) 279.9 lb/acre.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb/acre.

<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>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>1880</td>
<td>1787</td>
<td>1817</td>
<td>17.6</td>
<td>1765</td>
<td>1869</td>
</tr>
<tr>
<td>$S_2$</td>
<td>1844</td>
<td>1891</td>
<td>1900</td>
<td>1933</td>
<td>2035</td>
<td>1913</td>
</tr>
<tr>
<td>Mean</td>
<td>1862</td>
<td>1839</td>
<td>1858</td>
<td>1844</td>
<td>1900</td>
<td>1861</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of $R$ = 78.0 lb/acre.
S.E. of marginal mean of $S$ = 49.3 lb/acre.
S.E. of body of table = 110.3 lb/acre.
Crop: - Wheat. (Rabi)  
Site: - Institute of Plant Industry, Indore.  
Object: -To study the optimum spacing and economic seed rate for irrigated Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (iii) 7.11.1919. (iv) (a) Bakharings. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) Out of 6 blocks, for 4 blocks 20 lb./ac. of N as G.N.C. was given, in two blocks it was given a fortnight before sowing and for the remaining two just before sowing. For two blocks no manure was applied. (vi) Malvi EKD (vii) Irrigated. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations (1) and (2).
   1. 2 spacings: \( S_1 = 9" \) and \( S_2 = 14" \).
   2. 5 seed rates: \( R_1 = 40, R_2 = 60, R_3 = 80, R_4 = 100 \) and \( R_5 = 120 \) lb./ac.

3. DESIGN:
   (i) 2x5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 7'x35'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) Very good. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 1466 lb./ac.
   (ii) 305.2 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( R_1 )</th>
<th>( R_2 )</th>
<th>( R_3 )</th>
<th>( R_4 )</th>
<th>( R_5 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_1 )</td>
<td>1417</td>
<td>1498</td>
<td>1339</td>
<td>1417</td>
<td>1632</td>
<td>1471</td>
</tr>
<tr>
<td>( S_2 )</td>
<td>1465</td>
<td>1506</td>
<td>1348</td>
<td>1437</td>
<td>1552</td>
<td>1462</td>
</tr>
<tr>
<td>Mean</td>
<td>1441</td>
<td>1502</td>
<td>1343</td>
<td>1427</td>
<td>1617</td>
<td>1466</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of \( R \) = 88.1 lb./ac.
S.E. of marginal mean of \( S \) = 55.7 lb./ac.
S.E. of body of table = 124.6 lb./ac.

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Crop: - Wheat.  
Site: - Institute of Plant Industry, Indore.  
Object: -To study the effect of different spacings and seed rates on irrigated Wheat.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Ploughed twice. (b) N.A. (c) and (d) As per treatments. (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) No. (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 spacings: \( S_1 = 9" \) and \( S_2 = 14" \).
   (2) 5 seed rates: \( R_1 = 60, R_2 = 63, R_3 = 80, R_4 = 100 \) and \( R_5 = 120 \) lb./ac.

3. DESIGN:
   (i) 2x5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 19'x12'. (b) 35'x8'. (v) 2'x2'. (vi) N.A.

4. GENERAL:
   (i) Good. (ii) No. (iii) Grain yield. (iv) (a) No. (b) and (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 1270 lb./ac.
(ii) 216.3 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>R₅</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>1147</td>
<td>1273</td>
<td>1278</td>
<td>1202</td>
<td>1223</td>
<td>1225</td>
</tr>
<tr>
<td>S₂</td>
<td>1312</td>
<td>1196</td>
<td>1429</td>
<td>1338</td>
<td>1301</td>
<td>1315</td>
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<tr>
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<td>1229</td>
<td>1234</td>
<td>1353</td>
<td>1270</td>
<td>1262</td>
<td>1270</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of R = 62.43 lb./ac.
S.E. of marginal mean of S = 39.49 lb./ac.
S.E. of body of table = 88.30 lb./ac.

Crop: Wheat.
Site: Institute of Plant Industry, Indore.
Ref: M.P. 50(14).
Type: 'C'.
Object: To study the effect of interculturing with daura on the yield of Wheat under rain-fed conditions.

1. BASAL CONDITIONS:
(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 16/0/1950. (iv) (a) Raking once. (b) to (e) N.A. (v) N.A. (vi) C. 591 (medium). (vii) Unirrigated. (viii) As per treatments. (ix) N.A. (x) 12.3.1951.

2. TREATMENTS:
3 levels of interculture : I₀ = 0, I₁ = 1 and I₂ = 2 intercultures.

3. DESIGN:
(i) R.B.D. (ii) 3. (b) N.A. (iii) 8. (iv) a. 18'8" x 9'2". (b) 14' x 8'. (v) 2' x 2'4". (vi) Yes.

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

5. RESULTS:
(i) 363.0 lb./ac.
(ii) 65.37 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>I₀</td>
<td>379</td>
</tr>
<tr>
<td>I₁</td>
<td>354</td>
</tr>
<tr>
<td>I₂</td>
<td>356</td>
</tr>
</tbody>
</table>

S.E./mean = 23.10 lb./ac.

Crop: Wheat.
Site: Adhartal Farm, Jabalpore.
Ref: M.P. 51(25).
Type: 'C'.
Object: To study the performance of the crop harvested at different stages so as to save the crop from hail-storm.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Kolar. (b) Refer soil analysis, Jabalpore. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) N.A. (viii) Nil. (ix) N.A. (x) As per treatments.
2. TREATMENTS:
1. Harvesting at dough stage on 8.3.1952.
2. Harvesting 10 days after dough stage on 18.3.1952.
3. Harvesting at fully ripe stage (date not recorded).

3. DESIGN:
(i) R.B.D.  (ii) (a) 3.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 1/80 ac.  (v) Nil.  (vi) Yes.

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

5. RESULTS:
(i) 736.7 lb./ac.
(ii) 94.40 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>718.7</td>
</tr>
<tr>
<td>2.</td>
<td>740.3</td>
</tr>
<tr>
<td>3.</td>
<td>750.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>36.40 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.  Site: Govt. Exptl. Farm, Powarkheda.  Type: 'C'.

Object: To study the effect of different implements for sowing on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Clay loam (mariyar).  (b) Refer soil analysis, Powarkheda.  (iii) 4.11.1949.  (iv) (a) Bakharang.  (b) As per treatments.  (c) 80 lb./ac.  (d) 9°.  (e) N.A.  (f) N.A.  (g) A. 115 (local).

2. TREATMENTS:
5 implements: T1=Duffan, T2=Nari, T3=Dave's drill, T4=Tiffan and T5=5-tyned drill.

3. DESIGN:
(i) R.B.D.  (ii) (a) 5.  (b) N.A.  (iii) 3.  (iv) (a) and (b) 16'/x66'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1949—1951.  (b) to (c) N.A.  (v) (a) and (b) N.A.  (vi) Nil.  (vii) Yield is too poor.

5. RESULTS:
(i) 381.0 lb./ac.
(ii) 60.16 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>349.1</td>
</tr>
<tr>
<td>T2</td>
<td>374.8</td>
</tr>
<tr>
<td>T3</td>
<td>414.8</td>
</tr>
<tr>
<td>T4</td>
<td>409.1</td>
</tr>
<tr>
<td>T5</td>
<td>357.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>34.60 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat.  Site: Govt. Exptl. Farm, Powarkheda.  Type: 'C'.

Object: To study the effect of different implements of sowing on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Clay loam (mariyar).  (b) Refer soil analysis, Powarkheda.  (iii) 25.10.1950.  (iv) (a) Bakharang.  (b) As per treatments.  (c) 80 lb./ac.  (d) and (e) N.A.  (v) N.A.  (vi) A. 115 (local).

Object: To study the effect of different implements for sowing on the yield of Wheat.
2. TREATMENTS:

6 implements of sowing: \( T_1 = \text{Duffan} \), \( T_2 = \text{Narl} \), \( T_3 = \text{Dure's drill} \), \( T_4 = \text{Tiffan} \), \( T_5 = 5\text{-tyned drill} \) and \( T_6 = 8\text{-tyned drill} \).

3. DESIGN:

(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 16\( \times \)66\'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949–1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 676.6 lb./ac.
(ii) 91.8 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>( T_1 )</td>
<td>744.0</td>
</tr>
<tr>
<td>( T_2 )</td>
<td>657.0</td>
</tr>
<tr>
<td>( T_3 )</td>
<td>607.8</td>
</tr>
<tr>
<td>( T_4 )</td>
<td>701.2</td>
</tr>
<tr>
<td>( T_5 )</td>
<td>686.1</td>
</tr>
<tr>
<td>( T_6 )</td>
<td>663.5</td>
</tr>
</tbody>
</table>

S.E./mean = 37.40 lb./ac.

---

Crop :– Wheat.

Site:– Govt. Exptl. Farm, Powarkheda.

Object:– To study the effect of different implements of sowing on the yield of Wheat.

1. BASAL CONDITIONS:

(i) to (c) N.A. (ii) (a) Clay loam (marlyar). (b) Refer soil analysis, Powarkheda. (iii) 29.10.1951. (iv) (a) bhakhering. (b) As per treatments. (c) 80 lb./ac. (d) 12. (e) N.A. (f) N.A. (vi) A. 115 (local). (vii) N.A. (viii) N.A. (ix) 2.24'. (x) N.A.

2. TREATMENTS:

6 implements of sowing: \( T_1 = \text{Duffan} \), \( T_2 = \text{Narl} \), \( T_3 = \text{Dure's drill} \), \( T_4 = \text{Tiffan} \), \( T_5 = 5\text{-tyned drill} \) and \( T_6 = 8\text{-tyned drill} \).

3. DESIGN:

(i) R.B.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 16\( \times \)66\'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1949–1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable for the crop. Yield is too poor. (vii) Nil.

5. RESULTS:

(i) 384.3 lb./ac.
(ii) 64.56 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>352.6</td>
</tr>
<tr>
<td>2.</td>
<td>451.4</td>
</tr>
<tr>
<td>3.</td>
<td>403.1</td>
</tr>
<tr>
<td>4.</td>
<td>376.5</td>
</tr>
<tr>
<td>5.</td>
<td>436.9</td>
</tr>
<tr>
<td>6.</td>
<td>288.4</td>
</tr>
</tbody>
</table>

S.E./mean = 26.36 lb./ac.
Crop : Wheat. 
Site : Govt. Exptl. Farm, Powarkheda. 
Ref : M.P. 53(44). 
Type : 'C'.

Object : To find suitable seed rate for Wheat under irrigated conditions.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) Clay loam (mariyar). (b) Refer soil analysis, Powarkheda. (iii) 11.11.1953. (iv) (a) Bakharing. (b) N.A. (c) As per treatments. (d) 12°. (e) N.A. (v) N.A. (vi) Hy. 11-6 (medium). (vii) Irrigated. (viii) Nil. (ix) 1.25'. (x) N.A.

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

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

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

5. RESULTS :
   (i) 792.5 lb./ac.
   (ii) 118.4 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield
   --- | ---
   $R_1$ | 806.5
   $R_2$ | 898.5
   $R_3$ | 595.0
   $R_4$ | 870.0
   S.E./mean = 68.2 lb./ac.

Crop : Wheat. 
Site : Govt. Exptl. Farm, Powarkheda. 
Ref : M.P. 48(25). 
Type : 'C'.

Object : To study the effect of rotation of Wheat with different Rabi pulses.

1. BASAL CONDITIONS :
   (i) (a) Pulse—Wheat—Pulse. (b) As per treatments. (c) N.A. (ii) (a) Clay loam (mariyar). (b) Refer soil analysis, Powarkheda. (iii) 23.10.1948. (iv) (a) Bakharing. (b) Drilling. (c) 80 lb./ac. (d) 12°. (e) N.A. (v) N.A. (vi) A-115 (local). (vii) to (x) N.A.

2. TREATMENTS :
   4. Teora—Wheat.

3. DESIGN :
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 3. (iv) (a) and (b) 11' x 99'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Good (ii) N.A. (iii) Grain yield. (iv) (a) 1945 to 1949. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 572.3 lb./ac.
   (ii) 54.64 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield
   --- | ---
   1. | 613.4
   2. | 558.9
   3. | 522.9
   4. | 563.0
   S.E./mean = 24.44 lb./ac.
Crop :- Wheat.  
Ref :- M.P. 49(34)  
Type :- 'M'

Object — To study the effect of rotation of Wheat after different pulse.

1. BASAL CONDITIONS :
   (i) (a) Pulse-Wheat-Pulse (b) As per treatments. (c) N.A.  (ii) (a) Clay loam (marly-silt) (b) Refer soil analysis, Powarkheda.  (iii) N.A.  (iv) (a) bakharing.  (b) N.A.  (c) 80 lb./a.  (d) 12" (e) N.A.  (v) N.A.  (vi) A-115 (local) (vii) to (x) N.A.

2. TREATMENTS :
   4. Teora — Wheat.

3. DESIGN :
   (i) R.B.D.  (ii) (a) 4 (b) N.A.  (iii) 5 (iv) (a) and (b) 11' x 99' (v) Nil.  (vi) Yes.

4. GENERAL :
   (i) N.A.  (ii) N.A.  (iii) Grain and straw yield  (iv) (a) 1945 to 1949 (b) Yes  (c) N.A.  (v) (a) N.A.  (b) N.A.  (vi) & (vii) Nil.

5. RESULTS :
   (i) 374.1 lb./ac.  
   (ii) 29.24 lb./ac.  
   (iii) Treatments differ highly significantly.  
   (iv) Av. yield of grain in lb./ac. 
   Treatment | Av. yield | S.E./mean
   1         | 409.0     | 13.08 lb./ac.
   2         | 339.0     |              
   3         | 392.5     |              
   4         | 356.0     |              

---

Crop :- Wheat.  
Ref :- M.P. 48 (16)  
Type :- 'CV'

Object — To find out proper sowing date for two varieties of Wheat.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  (ii) (a) Black cotton soil (b) N.A.  (iii) As per treatments  (iv) (a) Bakharing (b) N.A.  (c) 60 lbs.  (d) 14" (e) N.A.  (v) Nil  (vi) As per treatments (vii) Unirrigated.  (viii) Weeding.  (ix) N.A.  (x) N.A.

2. TREATMENTS :
   Main-plot treatments :
   4 sowing dates: D1 = 15.10.1948, D2 = 30.10.1948, D3 = 15.11.1948 and D4 = 30.11.1948.
   Sub-plot treatments :
   2 varieties : V1 = C. 591 (medium) and V2 = Multif E.K.D.

3. DESIGN :
   (i) Split-plot.  (ii) (a) 4 main plots/block; 2 sub-plots/main-plot.  (b) N.A.  (iii) 4 (iv) (a) 18'-3" x 50' (b) 14' x 45'.  (v) 2 4' x 2'6" (vi) Yes.

4. GENERAL :
   (i) N.A.  (ii) N.A.  (iii) Grain and straw yield.  (iv) (a) 1947 to 1949.  (b) (c) N.A.  (v) (a) N.A.  (b) N.A.  (vi) & (vii) Nil.

5. RESULTS :
   (i) 995 lb./ac.  
   (ii) 157.4 lb./ac.  
   (b) 673.5 lb./ac.  
   (iii) Only D effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>1196</td>
<td>1322</td>
<td>939</td>
<td>715</td>
<td>1043</td>
</tr>
<tr>
<td>V₂</td>
<td>931</td>
<td>1039</td>
<td>1049</td>
<td>778</td>
<td>949</td>
</tr>
<tr>
<td>Mean</td>
<td>1063</td>
<td>1180</td>
<td>994</td>
<td>746</td>
<td>996</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 88.7 lb./ac.
2. V marginal means = 57.4 lb./ac.
3. V means at the same level of D = 114.9 lb./ac.
4. D means at the same level of V = 113.1 lb./ac.

Crop : Wheat (Rabi).
Site : Institute of Plant Industry, Indore.
Ref : M.P. 49(5).
Type : ‘CV’.

Object : To study the suitable sowing dates for the two varieties of Wheat.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) Bakharnig and ploughing. (b) and (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) As per treatments. (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :
Sub-plot treatments : 2 varieties: V₁=C-491 (medium) and V₂=Mahali E.K.D.

3. DESIGN :
(i) (a) Split-plot. (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 18"x60". (b) 14"x55". (v) 2'4"x2'6". (vi) Yes.

4. GENERAL :
(i) and (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1947 to 1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 618 lb./ac.
(ii) 157.27 lb./ac.
(iii) 88.05 lb./ac.
(iv) V and D effects are highly significant, while interaction is not significant.
(v) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>611</td>
<td>671</td>
<td>665</td>
<td>332</td>
<td>570</td>
</tr>
<tr>
<td>V₂</td>
<td>691</td>
<td>795</td>
<td>736</td>
<td>442</td>
<td>666</td>
</tr>
<tr>
<td>Mean</td>
<td>651</td>
<td>733</td>
<td>700</td>
<td>387</td>
<td>618</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 78.63 lb./ac,
3. V means at the same level of D = 62.89 lb./ac.
4. D means at the same level of V = 90.32 lb./ac.
Crop: Wheat.

Site: Institute of Plant Industry, Indore.

Object: To find out the optimum date of sowing for Wheat under rain-fed conditions.

1. BASAL CONDITIONS:

(i) (a) No. (b) Cotton. (c) Sann as G.M. manure.
(ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments.
(iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments.
(vii) Unirrigated. (viii) and (iv) N.A.

2. TREATMENTS:

Main-plot treatments:
3 sowing dates: D 1 = 1.10.1952, D 2 = 15.19.1952 and D 3 = 30.10.1952.

Sub-plot treatments:
2 varieties: V 1 = C-591 and V 2 = E.B. 69.

3. DESIGN:

(i) Split-plot. (ii) (a) 3 main-plots/block and 2 sub-plots/main-plot. (b) N.A.

4. GENERAL:


5. RESULTS:

(i) 571.4 lb./ac.
(ii) (a) 258.2 lb./ac.
(b) 122.2 lb./ac.

(iii) None of the effects is significant.

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

<table>
<thead>
<tr>
<th></th>
<th>D 1</th>
<th>D 2</th>
<th>D 3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V 1</td>
<td>484.8</td>
<td>792.0</td>
<td>388.8</td>
<td>555.2</td>
</tr>
<tr>
<td>V 2</td>
<td>672.0</td>
<td>739.2</td>
<td>351.6</td>
<td>587.6</td>
</tr>
<tr>
<td>Mean</td>
<td>578.4</td>
<td>765.6</td>
<td>370.2</td>
<td>571.4</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 129.1 lb./ac.
2. V marginal means = 49.9 lb./ac.
3. V means at the same level of D = 86.4 lb./ac.
4. D means at the same level of V = 126.9 lb./ac.

Crop: Wheat.

Site: Govt. Exptl. Farm, Powarkheda.

Object: To study the effect of spacing on the different varieties of Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Clay loam (marijir). (b) Refer soil analysis, Powarkheda.
(iii) 25.10.1950. (iv) (a) Bukhariing. (b) Drilling. (c) For S 1 = 80 lb./ac., for S 2 = 60 lb./ac. and for S 3 = 40 lb./ac. according to spacings (d) As per treatments.
(e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 2.11". (x) 25.5.1951.

2. TREATMENTS:

All combinations of (1) and (2)
(1) 2 varieties: V 1 = NP-52 and V 2 = A-115 (local).
(2) 3 spacings: S 1 = 12", S 2 = 18" and S 3 = 24".

3. DESIGN:

(i) 2 x 3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 1' x 9'9". (v) Nil. (vi) Yes.

Crop: Wheat.

Site: Govt. Exptl. Farm, Powarkheda.

Object: To study the effect of spacing on the different varieties of Wheat.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Clay loam (marijir). (b) Refer soil analysis, Powarkheda.
(iii) 25.10.1950. (iv) (a) Bukhariing. (b) Drilling. (c) For S 1 = 80 lb./ac., for S 2 = 60 lb./ac. and for S 3 = 40 lb./ac. according to spacings (d) As per treatments.
(e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 2.11". (x) 25.5.1951.

2. TREATMENTS:

All combinations of (1) and (2)
(1) 2 varieties: V 1 = NP-52 and V 2 = A-115 (local).
(2) 3 spacings: S 1 = 12", S 2 = 18" and S 3 = 24".

3. DESIGN:

(i) 2 x 3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 1' x 9'9". (v) Nil. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1953. (b) No. (c) N.A. (v) (a) and (b) N.A. 
(vi) and (vii) Nil.

5. RESULTS:
(i) 622.5 lb./ac.
(ii) 88.9 lb./ac.
(iii) V effect is significant, S effect is highly significant while interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>710.3</td>
<td>576.1</td>
<td>474.0</td>
<td>586.8</td>
</tr>
<tr>
<td>V₂</td>
<td>708.6</td>
<td>662.7</td>
<td>605.6</td>
<td>659.0</td>
</tr>
<tr>
<td>Mean</td>
<td>709.4</td>
<td>619.4</td>
<td>539.8</td>
<td>622.9</td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 25.64 lb./ac.
S.E. of V marginal mean = 20.92 lb./ac.
S.E. of body of table = 36.28 lb./ac.

Crop:—Wheat.
Site:—Govt. Exptl. Farm, Powarkheda.
Ref:—M.P. 51(53).
Type:—"CV".

Object:—To see the effect of spacing on different varieties of Wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Clay loam (marine). (b) Refer soil analysis, Powarkheda. (iii) 26, 27.10.1951.
(iv) (a) Sakhar. (b) Drilling. (c) 60 lb. for S₁, 60 lb. for S₂ and 40 lb. for S₃, according to spacings
(d) As per treatments. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 22.4". 
(x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 varieties : V₁ = NP-52 and V₂ = A-115 (local).
(2) 3 spacings : S₁ = 12", S₂ = 18" and S₃ = 24".

3. DESIGN:
(i) 3 x 2 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 12" x 90'-9". (v) Nil. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) N.A. (iii) Grain yield. (iv) (a) 1950—1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) The yield is too poor. The season was not favourable for the crop. (vii) Nil.

5. RESULTS:
(i) 315.9 lb./ac.
(ii) 169.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>V₁</td>
<td>288.9</td>
<td>265.4</td>
<td>299.7</td>
<td>285.6</td>
</tr>
<tr>
<td>V₂</td>
<td>398.9</td>
<td>281.4</td>
<td>358.4</td>
<td>346.2</td>
</tr>
<tr>
<td>Mean</td>
<td>343.9</td>
<td>274.9</td>
<td>329.1</td>
<td></td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 31.6 lb./ac.
S.E. of V marginal mean = 25.8 lb./ac.
S.E. of body of table = 44.5 lb./ac.
Crop: Wheat. Ref: M. P. 52 (37).
Site: Govt. Exptl. Farm, Powarkheda. Type: 'CV'.

Object: To find the optimum spacing for different varieties of Wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Clay loam (mariyar). (b) Refer soil analysis, Powarkheda. (iii) 27.10.1932. (iv) (a) Bakharai. (b) and (c) N.A. (d) As per treatments. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 0.15'. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 2 varieties: V₁=Hy.115 (Local) and V₂=Hy.52.
   (2) 3 spacings: S₁=12", S₂=18" and S₃=24'.

3. DESIGN:
   (i) 2x3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 12' x 45' 4.5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 308.6 lb./ac.
   (ii) 48.00 lb./ac.
   (iii) Only V effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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<td>V₂</td>
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<td>290.9</td>
<td>285.7</td>
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<tr>
<td>Mean</td>
<td>314.4</td>
<td>306.0</td>
<td>305.4</td>
<td>308.6</td>
</tr>
</tbody>
</table>

S.E. of S marginal mean = 13.76 lb./ac.
S.E. of V marginal mean = 11.20 lb./ac.
S.E. of body of table = 19.52 lb./ac.

Site: Govt. Exptl. Farm, Powarkheda. Type: 'CV'.

Object: To find out suitable spacing for different Wheat varieties.

1. BASAL CONDITIONS:
   (i) (a) Nil. b. Wheat. (c) 10 lb./ac. of N as A/S+10 lb./ac. P₂O₅ of as Super. (ii) (a) Clay loam (mariyar). (b) Refer soil analysis Powarkheda. (iii) 31.10.1953. (iv) (a) Bakharai. (b) Seeds sown with dhar plough. (c) 80 lb./ac. (d) As per treatments. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) 1 25'. (x) 10.4.1954.

2. TREATMENTS:
   All combinations of (1) and (2).
   (1) 2 varieties: V₁=Hy 11 and V₂=Hy.15
   (2) 3 spacings: S₁=12", S₂=18" and S₃=24'.

3. DESIGN:
   (i) 2x3 Fact. in R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a), (b) 16' x 33'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 514.4 lb./ac.
(ii) 51.60 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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<tbody>
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<td>543.2</td>
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<td>520.6</td>
<td>534.4</td>
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</table>

S.E. of S marginal mean = 14.88 lb./ac.
S.E. of V marginal mean = 12.16 lb./ac.
S.E. of body of table = 21.06 lb./ac.

Crop: Wheat.
Site: Central Res. Farm, Ujjain.
Ref: M.P. 51(1).
Type: 'CV'.

Object: To find out suitable sowing date for different Wheat varieties.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) Bakharing. (b) N.A. (c) N.A. (d) Rows 1' apart. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 17.3.1952.

2. TREATMENTS:

Sub-plot treatments:
2 varieties: V₁ = G.D. 11 (late) and V₂ = Ujjain No. 22 (early).

3. DESIGN:

(i) Split-plot. (ii) (a) 5 main-plots/block; 2 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 16'x96' for main-plot and 8'x96' for sub-plot. (b) 6'x90'. (v) 1'x3'. (vi) Yes.

4. GENERAL:

(i) Stand was good but due to lack of winter rains the crop was poor. (ii) Nil. (iii) Grain and straw yield. (iv) (a) No. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 469.0 lb./ac.
(ii) 72.60 lb./ac.
(iii) 45.17 lb./ac.
(iv) D and V effects are highly significant while interaction D x V is not significant.
(v) Av. yield of grain in lb./ac.

<table>
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<tr>
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<th>D₃</th>
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<td>567.8</td>
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<tr>
<td>Mean</td>
<td>361.2</td>
<td>435.9</td>
<td>510.7</td>
<td>549.4</td>
<td>488.9</td>
<td>469.0</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means = 29.64 lb./ac.
2. V marginal means = 11.66 lb./ac.
3. V means at the same level of D = 25.81 lb./ac.
4. D means at the same level of V = 34.68 lb./ac.
Crop - Wheat.  
Site: - Govt. Exptl. Farm, Powarkheda.  
Ref.: - M.P. 52(36).  
Type: - 'CM'.

Object: - To see the effect of different doses of N and different seed rates for Wheat.

1. BASAL CONDITIONS:  
(i) (a) to (c) N.A.  
(ii) (a) Clay loam (marooyar)  
(iv) (a) Bakharde.  
(iv) (c) 80 lb. per acre.  
(d) 1/2.  
(vi) N.A.  
(vii) Unirrigated.  
(viii) N.A.  

2. TREATMENTS:  

Main-plot treatments:  
3 seed rates: R1 = 60, R2 = 80, and R3 = 100 lb. per acre.

Sub-plot treatments:  
3 levels of N as A/S: N0 = 0, N1 = 10, and N2 = 15 lb. per acre.

3. DESIGN:  
(i) S.T.  
(ii) 3 main-plots/block; 3 sub-plots/main-plot.  

3. RESULTS:  

<table>
<thead>
<tr>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>Mean</th>
</tr>
</thead>
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<tr>
<td>N0</td>
<td>310.1</td>
<td>325.1</td>
<td>321.6</td>
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<tr>
<td>N1</td>
<td>395.0</td>
<td>380.0</td>
<td>418.4</td>
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<tr>
<td>N2</td>
<td>418.2</td>
<td>344.8</td>
<td>316.6</td>
</tr>
</tbody>
</table>

Mean: 374.1, 350.0, 338.3, 354.4

S.E. of difference of two  
1. R marginal means = 37.11 lb. per acre.  
2. N marginal means = 23.49 lb. per acre.  
3. N means at the same level of R = 40.27 lb. per acre.  
4. R means at the same level of N = -49.54 lb. per acre.

Crop: - Wheat.  
Site: - Govt. Exptl. Farm, Powarkheda.  
Ref.: - M.P. 53(3).  
Type: - 'CM'.

Object: - To study the effect of different doses of N with different seed rates on the yield of wheat.

1. BASAL CONDITIONS:  
(i) (a) No (b) wheat (c) 10 lb. per acre of N as A/S+10 lb. per acre of P2O5 as Anmec. Pltes.  
(ii) (a) Clay loam (marooyar)  
(iv) (a) Bakharde.  
(iv) (c) 80 lb. per acre.  
(d) 1/2.  
(vi) N.A.  
(vii) Unirrigated.  
(viii) N.A.  

2. TREATMENTS:  

Main-plot treatments:  
3 seed rates: R1 = 60, R2 = 80, and R3 = 100 lb. per acre.

Sub-plot treatment:  
3 levels of N as A/S: N0 = 0, N1 = 10, and N2 = 15 lb. per acre.
3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 3 (iv) (a), (b) 33'x16' (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS:
(i) 519.9 lb./ac. (ii) (a) 68.8 lb./ac. (b) 62.4 lb./ac. (iii) None of the effects is significant. (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R1</th>
<th>R2</th>
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<tr>
<td>N0</td>
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<td>511.5</td>
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<tr>
<td>N2</td>
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<td>529.9</td>
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<tr>
<td>Mean</td>
<td>512.8</td>
<td>525.8</td>
<td>521.0</td>
<td>519.9</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. R marginal means =32.43 lb./ac.
2. N marginal means =29.41 lb./ac.
3. N means at the same level of R =50.95 lb./ac.
4. R means at the same level of N =52.75 lb./ac.

Crop :- Wheat. 
Site :- Labhandi Farm, Raipur.
Ref:- M.P. 48 (30)
Type :- CMV

Object :- To test the effect and interactions of different levels of manural treatments and seed rates for two varieties of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil (b) wheat (c) N.A. (ii) (a) Heavy loam (Kankar.) (b) N.A. (iii) N.A. (iv) (a) Ploughing (b) Seeds drilled. (c) As per treatments. (d) and (e) N.A. (f) Nil (g) As per treatments (h) Irrigated (i) to (a) N.A.

2. TREATMENTS:
Main-plot treatments:
2 varieties : V1=A 115 (local) and V2=AO 13 (local).
Sub-plot treatments:
4 manures : M1=0, M2=10 lb./ac. of N as G.N.C., M3=10 lb./ac. of N as A/S and M4=10 lb./ac. of N as Ammo. Phos.
Sub-sub-plot treatments:
2 seed rates : R1=80 and R2=100 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) 2 main-plot/block; 4 sub-plots/main plot and 2 sub-sub-plots/sub-plot. (iii) 6 (iv) (a) and (b) 1/80 ac. (v) Nil (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain. yield. (iv) (a) 1945 to 1950 (b) Yes. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Plot-wise data N.A.

5. RESULTS:
(i) 302.7 lb./ac. (ii) (iii) N.A.
Object: To study the effect of manures and seed rates on Wheat varieties.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Heavy loam (kanskar).  (b) N.A.  (iii) N.A.  (iv) (a) and (b) N.A.  (c) As per treatments.  (d) and (e) N.A.  (v) Nil.  (vi) As per treatments.  (vii) Irrigated and unirrigated (2 experiments.)  (viii) to (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties: $V_1$ = A 115 (local) and $V_2$ = AO 13 (local).
   Sub-plot treatments:
   4 manures: $M_0$ = 0, $M_1$ = 10 lb./ac. of N as G.N.C., $M_2$ = 10 lb./ac. of A/S and $M_3$ = 10 lb./ac. of N as Ammo. Phos.
   Sub-sub-plot treatments:
   2 seed rates: $R_1$ = 80 and $R_2$ = 100 lb./ac.

3. DESIGN:
   (i) Split-plot.  (ii) (a) 2 main-plots/block, 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 1/80 ac.  (v) Nil.  (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A.  (iii) Grain yield.  (iv) (a) 1945 to 1950.  (b) and (c) Yes.  (v) (a) and (b) N.A.  (vi) Nil.  (vii) Plot wise data N.A.

5. RESULTS:

\[ \text{Irrigated} \]

\[
\begin{array}{cccccc}
 M_0 & M_1 & M_2 & M_3 & \text{Mean} & R_1 \\
 V_1 & 412.0 & 462.5 & 502.0 & 595.5 & 493.0 \\
 V_2 & 572.0 & 688.0 & 639.5 & 781.0 & 670.2 \\
 \text{Mean} & 492.0 & 575.3 & 570.8 & 688.3 & 581.6 \\
 R_1 & 439.0 & 527.0 & 500.0 & 679.0 & 536.3 \\
 R_2 & 545.0 & 623.5 & 641.5 & 697.5 & 626.9 \\
\end{array}
\]
Object:—To study the effect of different levels of manures and seed rates on different varieties of Wheat under irrigated conditions.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Wheat. (c) As per treatments. (ii) (a) Kankar. (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) Drilled. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Irrigated. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   2 varieties: V₁=A 115 (local) and V₂=AO 13 (local).
   Sub-plot treatments:
   4 manures: M₀=0, M₁=10 lb./ac. of N as G.N.C., M₂=10 lb./ac. of A/S and M₃=10 lb./ac. of N as Ammo. Phos.
   Sub-sub-plot treatments:
   2 seed rates: R₁=80 and R₂=100 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 2 main-plots/block, 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (ii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1945 to 1950. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 466.9 lb./ac.
   (ii) (a) 77.8 lb./ac.
   (b) 126.1 lb./ac.
   (c) 107.0 lb./ac.
   (iii) Only M effect is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
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<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
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<tr>
<td>R₂</td>
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<td>496.9</td>
<td>480.2</td>
<td>457.7</td>
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</table>
S.E. of difference of two
1. V marginal means =15.9 lb./ac.
2. M marginal means =36.4 lb./ac.
3. R marginal means =21.8 lb./ac.
4. M means at the same level of V =51.5 lb./ac.
5. V means at the same level of M =47.4 lb./ac.
6. R means at the same level of V =30.9 lb./ac.
7. V means at the same level of R =27.8 lb./ac.
8. R means at the same level of M =43.7 lb./ac.
9. M means at the same level of R =47.7 lb./ac.

Crop :- Wheat.
Site :- Labhandi Farm, Raipur.

Object:—To study the effect of manures and seed rates on Wheat varieties.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Heavy loam (kankar). (b) N.A. (iii) N.A. (iv) (a) Ploughing. (b) Seeds drilled. (c) As per treatments. (d) and (e) N.A. (v) Nil. (vi) As per treatments. (vii) Un-irrigated. (viii) N.A. (ix) 2.78". (x) N.A.

2. TREATMENTS.
Main-plot treatments:
2 varieties: V_1= A-115 (local) and V_2= AO-113 (local).
Sub-plot treatments:
4 manures: M_0=0, M_1=10 lb./ac. of N as G.N.C., M_2= 10 lb./ac. of N as A/S and M_3=10 lb./ac. of N as Ammo. Phos.
Sub-sub-plot treatments:
2 seed rates : R_1=80 and R_2=100 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block ; 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (i:vi) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1945—1951. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Plot-wise data—N.A.

5. RESULTS:
(i) 260.5 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

<table>
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<th>M_2</th>
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</table>
Crop :- Wheat (Rahi).
Site :- Labhandi Farm, Raipur.

Object :- To find the effect of manures and seed rate for unirrigated Wheat varieties.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Heavy loam (Kankar). (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments.
(vii) Unirrigated. (viii) N.A. (ix) 5.60’. (x) N.A.

2. TREATMENTS:
Main-plot treatments:
2 varieties: V₁ = A-115 (local) and V₂ = AO 13 (local).

Sub-plot treatments:
4 manures: M₀ = 0, M₁ = 10 lb./ac. of N as G.N.C., M₂ = 10 lb./ac. of N as A/S and M₃ = 10 lb./ac. of N as Ammo. Phos.

Sub-sub-plot treatments:
2 seed rates: R₁ = 80 and R₂ = 100 lb./ac.

3. DESIGN:
(i) Split-split-plot. (ii) (a) 2 main-plots/block; 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot (b) N.A.
(iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1945 to 1950. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil.
(vii) Only the average yield was available.

5. RESULTS:
(i) 302.6 lb./ac.
(ii) N.A.
(iii) N.A.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
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</table>
3. DESIGN:
(i) Split-split-plot. (ii) 2 main-plots/block; 4 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A.
(iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1945—1950. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 718.7 lb./ac.
(ii) (a) 59.4 lb./ac.
(b) 131.0 lb./ac.
(c) 110.3 lb./ac.
(ii) Only M effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>M_0</th>
<th>M_1</th>
<th>M_2</th>
<th>M_3</th>
<th>Mean</th>
<th>R_1</th>
<th>R_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_1</td>
<td>570.3</td>
<td>710.3</td>
<td>695.3</td>
<td>883.8</td>
<td>714.9</td>
<td>718.8</td>
</tr>
<tr>
<td>V_2</td>
<td>526.9</td>
<td>750.4</td>
<td>692.0</td>
<td>920.5</td>
<td>722.4</td>
<td>737.1</td>
</tr>
<tr>
<td>Mean</td>
<td>548.6</td>
<td>730.3</td>
<td>693.7</td>
<td>902.1</td>
<td>718.7</td>
<td>727.9</td>
</tr>
<tr>
<td>R_1</td>
<td>540.3</td>
<td>748.7</td>
<td>692.0</td>
<td>930.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R_2</td>
<td>556.9</td>
<td>712.0</td>
<td>695.4</td>
<td>873.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means
2. M marginal means
3. R marginal means
4. M means at the same level of V
5. V means at the same level of M
6. R means at the same level of V
7. V means at the same level of R
8. R means at the same level of M
9. M means at the same level of R

Crop: Wheat.
Site: Reura Farm, Satna.
Object: To study the effect of N and P under different number of irrigations.

1. BASAL CONDITIONS:
(i) (a) Paddy-Berseem-Moong-Wheat. (b) Moong type 1. (c) Nil. (ii) (a) Mixed red and black soil. (b) N.A. (iii) 27.12.1953. (iv) (a) After harvesting moong two discings were given. (b) Sown by nari plough. (c) 32 srs/ac. (d) Rows 10" apart. (e) N.A. (v) Nil. (vi) C-591 (medium). (vii) Irrigated. (viii) Nil. (ix) 3.00'. (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 3 levels of N: N_0 = 0, N_1 = 20 and N_2 = 40 lb./ac.
(2) 3 levels of P_2O_5: P_0 = 0, P_1 = 20 and P_2 = 40 lb./ac.
(3) 3 levels of irrigation: I_1 = 1, I_2 = 2 and I_3 = 3 irrigations.

3. DESIGN:
(i) 3rd confd. J component of J confounded. (ii) (a) 3 blocks/replication; 9 plots/block. (b) N.A. (iii) 1.
(iv) (a) 40' * 27'. (b) 36' * 23'. (v) 2' alround. (vi) Yes.
4. GENERAL:
(i) No lodging. (ii) Brown rust was common in all the plots. (iii) Height and tillering. No. of grains per earhead, wt. of 1000 grains, No. of earhead per plant. (iv) (a) 1953—1955. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 86.4 lb./ac.
(ii) 198.9 lb./ac.
(iii) Only main effects of N, P and I are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>I₁</td>
<td>504</td>
<td>809</td>
<td>691</td>
<td>668</td>
<td>537</td>
<td>686</td>
<td>781</td>
</tr>
<tr>
<td>I₂</td>
<td>681</td>
<td>892</td>
<td>1025</td>
<td>866</td>
<td>713</td>
<td>890</td>
<td>995</td>
</tr>
<tr>
<td>I₃</td>
<td>748</td>
<td>1136</td>
<td>1287</td>
<td>1057</td>
<td>841</td>
<td>1025</td>
<td>1304</td>
</tr>
<tr>
<td>Mean</td>
<td>644</td>
<td>946</td>
<td>1001</td>
<td>864</td>
<td>697</td>
<td>867</td>
<td>1027</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 66.3 lb./ac.
S.E. of body of any table = 114.7 lb./ac.

Crop:— Wheat. Ref: Complex experiments (T.C.M.), 1953.
Centre:— Obedullaganj (M.P.) Type: ‘IM’.
Object:— VII. To study the effect of irrigation along with manures.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Loam in texture and deep black in colour. (b) N.A. (iii) 30.10.1953. (iv) N.A. (v) N.A. (vi) C-591. (vii) Irrigated. (viii) Nil. (ix) 33. 42°. (x) 27.4.1954.

2. TREATMENTS:
All combinations of (1), (2), and (3).
(1) 3 levels of N: N₀=0, N₁=20 and N₂=40 lb./ac.
(2) 3 levels of P₂O₅: P₀=0, P₁=20 and P₂=40 lb./ac.
(3) 3 irrigations: I₀=0, I₁=1 and I₂=2 irrigations.
N as A/S broadcast just before sowing while P₂O₅ as Super was mixed with seed and drilled in lines.
(Due to shortage of water, 2nd irrigation could not be given. So the plots which were to receive 2 irrigations actually received only one irrigation).

3. DESIGN:
(i) 3² Fact. confd.: (ii) (a) 3 blocks/replication; 9 plots/block. (b) N.A. (iii) 1. (iv) (a) N.A. (b) 30’x25’. (v) N.A. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Slight attack of grass-hopper and loose-smut. (iii) Yield of grain. (iv) (a) 1953-55. (b) No. (c) N.A. (v) (a) Kota, Banaras, Fura, Satta, and Paliad. (b) N.A. (vi) Nil. (vii) I has only two levels I₀ and I₁; I₂ is the same as I₁.

5. RESULTS:
(i) 1318 lb./ac.
(ii) 234.8 lb./ac.
(iii) Main effect of I is significant. Other effects are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>I₀</th>
<th>I₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>1083</td>
<td>1334</td>
<td>1264</td>
<td>1234</td>
<td>1.25</td>
<td>1283</td>
</tr>
<tr>
<td>P₁</td>
<td>1052</td>
<td>1366</td>
<td>1460</td>
<td>1291</td>
<td>975</td>
<td>1448</td>
</tr>
<tr>
<td>P₂</td>
<td>1356</td>
<td>1412</td>
<td>1525</td>
<td>1431</td>
<td>1003</td>
<td>1645</td>
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<tr>
<td>Mean</td>
<td>1164</td>
<td>1369</td>
<td>1423</td>
<td>1318</td>
<td>1034</td>
<td>1460</td>
</tr>
<tr>
<td>I₀</td>
<td>913</td>
<td>1135</td>
<td>1316</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>I₁</td>
<td>1289</td>
<td>1486</td>
<td>1606</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N, P and I₀ = 71.27 lb./ac.
S.E. of marginal mean of I₁ = 55.15 lb./ac.
S.E. of b. dy of N x P table = 135.5 lb./ac.
S.E. of I₁ x P or I₀ x N means = 95.88 lb./ac.

---

Crop: Wheat.  Ref: Complex experiments (T.C.M.), 1953.
Centre: Satna (M.P.).  Type: 'IM'.

Object: To study the effect of irrigation along with manures.

1. BASAL CONDITIONS:
   (viii) Nil.  (ix) 43.77°.  (x) 21.4.1954.

2. TREATMENTS:
   All combinations of (1), (2) and (3).
   (1) 3 levels of N: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
   (2) 3 levels of P₂₀₅: P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.
   (3) 3 irrigations: I₁ = 1, I₂ = 2 and I₃ = 3 irrigations.

Manures applied at the time of sowing. N as A/S and P₂₀₅ as triple Super.

3. DESIGN:
   (i) 3² P tact. in R.B.D. (conf-1.) (ii) 9 plots/block and 3 blocks/repl. (b) N.A.  (iii) 1.  (iv) (a) N.A.
   (b) 35' x 21'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) Normal.  (ii) Crop suffered from brown-rust and draught conditions (iii) Grain yield.  (iv) (a) 1953-1956
   (b) No.  (c) N.A.  (y) (a) Kotah, Varanasi, Puri, Paliad and Obedullaganj.  (b) N.A.  (vi) Nil.  (vii) Nil.

5. RESULTS:
   (i) 955 lb./ac.
   (ii) 155.5 lb./ac.
   (iii) Main effects of N, P and I are significant. None of the interactions is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
<th>I₁</th>
<th>I₁</th>
<th>I₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>640</td>
<td>834</td>
<td>836</td>
<td>770</td>
<td>993</td>
<td>788</td>
<td>928</td>
</tr>
<tr>
<td>P₁</td>
<td>659</td>
<td>1147</td>
<td>1086</td>
<td>964</td>
<td>759</td>
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<td>1154</td>
<td>1406</td>
<td>1131</td>
<td>863</td>
<td>1096</td>
<td>1435</td>
</tr>
<tr>
<td>Mean</td>
<td>711</td>
<td>1045</td>
<td>1101</td>
<td>955</td>
<td>738</td>
<td>956</td>
<td>171</td>
</tr>
<tr>
<td>I₀</td>
<td>517</td>
<td>894</td>
<td>764</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I₁</td>
<td>751</td>
<td>987</td>
<td>1130</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I₂</td>
<td>824</td>
<td>1253</td>
<td>1435</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 51.8 lb./ac.
S.E. of body of any table = 89.8 lb./ac.
Crop:  Wheat.  
Ref: M.P. 52(35).

Site:  Govt. Seed and Demonstration Farm, Betul.  
Type:  ‘D’.

Object:  To study the effect of pre-treatment of Wheat seed with solution of fertilizers on the yield of Wheat.

1. **BASAL CONDITIONS:**
   (i) (a) to (c) N.A.  (ii) (a) Morand II.  (b) Refer soil analysis, Betul.  (iii) 25.10.1952.  (iv) (a) Bakh-ringa.  (b) to (e) N.A.  (v) N.A.  (vi) A 115 (early).  (vii) Unirrigated.  (viii) Nil (ix) 18.30.  (x) 5.6.1953.

2. **TREATMENTS:**
   1. Dry seed (control).
   2. Seed soaked in pure water for 24 hours.
   3. Seed soaked in mono-potassium phosphate solution (1 molar) for 24 hours.
   4. Seed soaked in A/S solution (1 molar) for 24 hours.

   The measured quantity of seed was taken and was soaked in glazed clay pots. A/S solution prepared by taking 330 grams of A/S dissolved in 5 lb. of water. Mono potassium phosphate solution has been prepared by taking 340 grams of salt and dissolving in 5 lb. of pure water.

3. **DESIGN:**
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 5.  (iv) (a) N.A.  (b) 1/80 ac.  (v) N.A.  (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1952—1953.  (b) and (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 596 lb./ac.
   (ii) 92.8 lb./ac.
   (iii) Treatments differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>640</td>
</tr>
<tr>
<td>2.</td>
<td>688</td>
</tr>
<tr>
<td>3.</td>
<td>528</td>
</tr>
<tr>
<td>4.</td>
<td>528</td>
</tr>
<tr>
<td>S.E./mean = 41.6 lb./ac.</td>
<td></td>
</tr>
</tbody>
</table>

Crop:  Wheat.  
Ref: M.P. 35 (24).

Site:  Govt. Seed and Demonstration Farm, Betul.  
Type:  ‘D’.

Object:  To study the effect of pretreatment of seed with solution of some fertilizers on Wheat.

1. **BASAL CONDITIONS:**
   (i) (a) to (c) N.A.  (ii) (a) Morand II.  (b) Refer soil analysis, Betul.  (iii) N.A.  (iv) (a) Bakh-ringa.  (b) to (e) N.A.  (v) N.A.  (vi) Unirrigated.  (vii) to (x) N.A.

2. **TREATMENTS:**
   1. Dry seed (control).
   2. Seed soaked in pure water for 24 hours.
   3. Seed soaked in A/S solution (1 molar) for 24 hours.
   4. Seed soaked in Mono-potassium phosphate solution (1 molar) for 24 hours.

3. **DESIGN:**
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 5.  (iv) (a) N.A.  (b) 1/80 ac.  (v) N.A.  (vi) Yes.

4. **GENERAL:**
   (i) Satisfactory.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1952—1953.  (b) and (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 490 lb./ac.
   (ii) 97.60 lb./ac.
Crop :- Wheat (\textit{Rabi}).

Ref: - M.P. 53(93).

Site :- Govt. Seed and Demonstration Farm, Betul.

Type :- 'D'.

Object: - To see the effect of seed soaked in different solutions.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) and (b) Refer soil analysis, Betul. (iii) to (c) N.A.

2. TREATMENTS:
   1. Dry seed sown.
   2. Seed soaked in pure water for 24 hours.
   3. Seed soaked in A/S solution for 24 hours (1 molar).
   4. Seed soaked in Pot. Phos. solution for 24 hours (1 molar).

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 1/80. ac. (v) and (vi) N.A.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) to (vii) N.A.

5. RESULTS:
   (i) 1008 lb/ac.
   (ii) 199.1 lb/ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb/ac

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>536</td>
</tr>
<tr>
<td>2.</td>
<td>436</td>
</tr>
<tr>
<td>3.</td>
<td>472</td>
</tr>
<tr>
<td>4.</td>
<td>516</td>
</tr>
</tbody>
</table>

S.E./mean = 43.20 lb/ac.

Crop :- Wheat.

Ref: - M.P. 52(27).

Site :- Adhartal Farm, Jabalpore.

Type :- 'D'.

Object: - To study the effect of soaking Wheat seed in different solutions prior to sowing.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Kabar. (b) Refer soil analysis, Jabalpore. (iii) 28.10.1952. (iv) (a) and (b) N.A. (c) 80 lb/ac. (d) and (e) N.A. (v) N.A. (vi) A.O. 90 (medium). (vii) to (ix) N.A. (x) 1.4.1953.

2. TREATMENTS:
   1. Dry seed (control).
   2. Seed soaked in pure water for 24 hours.
   3. Seed soaked in one molar solution of A/S for 24 hours.
   4. Seed soaked in one molar solution of mono-potassium phosphate for 24 hours.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) (a) and (b) 33' x 16'. (v) 2' between 2 plots. (vi) Yes.
4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1952—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Plants dried very fast for want of moisture in the soil. Whithering was common in all plots. (vii) Nil.

5. RESULTS:
(i) 309.4 lb./ac.
(ii) 29.20 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>272.0</td>
</tr>
<tr>
<td>2.</td>
<td>355.8</td>
</tr>
<tr>
<td>3.</td>
<td>311.8</td>
</tr>
<tr>
<td>4.</td>
<td>297.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>±13.04 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Site :- Labhandi Farm, Raipur.  
Ref:- M.P. 52 (52)  
Type :- 'M'

Object :- To study the effect of heating the wheat seed with manurial solutions before sowing on the yield of Wheat.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) and (b) N.A. (iii) 7.11.1952. (iv) (a) Ploughing (b) Seeds drilled. (c) 80 lb./ac. (d) Rows 9" apart. (e) N.A. (v) Nil. (vi) A 115 (local) (vii) Irrigated. (viii) weeding. (ix) N.A. (x) 18.3.53.

2. TREATMENTS:
1. Dry seed (control).
2. Seed treated in water.
3. Seed treated in A/S solution for 24 hours.
4. Seed treated in mono-potassium phosphate solution for 24 hours.

3. DESIGN:
(i) R.B.D. (ii) (a) 4 (b) N.A. (iii) 5 (iv) (a) 33'X16' (b) 33'X16'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1953. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) & (vii) Nil.

5. RESULTS:
(i) 206.9 lb./ac.
(ii) 31.48 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>195.0</td>
</tr>
<tr>
<td>2.</td>
<td>236.0</td>
</tr>
<tr>
<td>3.</td>
<td>196.5</td>
</tr>
<tr>
<td>4.</td>
<td>200.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>±14.68 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat.  
Site :- Labhandi Farm, Raipur.  
Ref:- M.P. 53 (45).  
Type :- 'D'

Object :- To study the effect of treating the wheat seed before sowing in different solutions.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Dorsa. (b) N.A. (iii) 4.11.1953. (iv) (a) Ploughing. (b) Seeds drilled. (c) and (d) N.A. (e) N.A. (v) N.A. (vi) A 115 (local). (vii) Irrigated. (viii) weeding. (ix) N.A. (x) 15.2.1954.
2. TREATMENTS:
1. Dry seed (control).
2. Seed soaked in pure water for 24 hours.
3. Seed soaked in A/S solution for 21 hours.
4. Seed soaked in 1 M sodium phosphate.

3. DESIGN:
(i) R.B.D.
(ii) (a) 4.
(b) N.A.
(iii) S.
(iv) (a), (b) 3 3' × 16'.
(v) Nil.
(vi) Yes.

4. GENERAL:
(i) Good.
(ii) Nil.
(iii) Grain and straw yield. (iv) (a) 1952 to 1953.
(b) and (c) N.A. (v) (a) N.A.
(b) N.A. (vi) No. and (vii) Nil.

5. RESULTS:
(i) 350 lb/ac.
(ii) 101.0 lb/ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>388</td>
</tr>
<tr>
<td>2.</td>
<td>324</td>
</tr>
<tr>
<td>3.</td>
<td>360</td>
</tr>
<tr>
<td>4.</td>
<td>328</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=45.4 lb/ac.</td>
</tr>
</tbody>
</table>

Crop:—Wheat (Rahit).
Site:—Institute of Plant Industry, Indore.
Ref:—M.P. 494.
Type:—DV.

Object:—To study the effect of soaking wheat seed before sowing with the nutrients on the yield of wheat.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 8.11.1949. (iv) (a) Bakhter. (b) and (c) N.A. (d) 14'. (e) —. (v) N.A. (vi) As per treatments. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
Main-plot treatments:
2 varieties: V1 = C. 591 and V2 = Mahi E.K.D.

Sub-plot treatments:
Soaking of seeds: D1 = Dry seed, D2 = Soaked in water once for 6 hours and then dried, D3 = Soaked in water twice and dried, D4 = Soaked in one molar solution of A/S, D5 = Soaked in one molar solution of aluminium phosphate.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 6 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) a) 5'4" × 60'. (b) 4'8" × 35'. (v) 2'4" × 2'6". (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Weight of grain and fodder. (iv) (a) 1949—N.A. (b) and (c) N.A. (v) N.A. (x) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 705.0 lb/ac.
(ii) (v) 257.5 lb/ac.
(b) 131.3 lb/ac.
(iii) None of the effects is significant.
Object:—To study the effect of seed soaked in different chemicals of the two varieties.

1. BASAL CONDITIONS:
(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 varieties: V1=C. 591 and V2=Malvi E.K.D.
(2) Soaking of seeds: D0=No soaking, D1=Soaked in water once, D2=Soaked in water twice, D3=Soaked in A/S, D4=Soaked in Ammo. Phos. and D6=Soaked in potassium phosphate.

3. DESIGN:
(i) 2x6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 47'x10.4'. (b) 35'x7'. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 569.6 lb./ac.
(ii) 95.20 lb./ac.
(iii) V effect is highly significant, D effect is significant while interaction is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D0</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D6</th>
<th>Mean</th>
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<tbody>
<tr>
<td>V1</td>
<td>565.1</td>
<td>609.4</td>
<td>542.9</td>
<td>576.1</td>
<td>476.4</td>
<td>454.2</td>
<td>537.3</td>
</tr>
<tr>
<td>V2</td>
<td>620.4</td>
<td>653.7</td>
<td>631.5</td>
<td>631.5</td>
<td>542.9</td>
<td>531.8</td>
<td>602.0</td>
</tr>
<tr>
<td>Mean</td>
<td>592.7</td>
<td>631.5</td>
<td>587.2</td>
<td>601.8</td>
<td>509.6</td>
<td>493.0</td>
<td>569.6</td>
</tr>
</tbody>
</table>

S.E. of V marginal means = 19.43 lb./ac.
S.E. of D marginal means = 33.66 lb./ac.
S.E. of body of table = 47.60 lb./ac.
Crop: Wheat (Rabi).

Site: Institute of Plant Industry, Indore.

Object: To study the effect of soaking wheat seed in nutrient solutions before sowing on the yield of Wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Cotton. (c) A.C./ac. of F.Y.M. and green manuring with sam.. (ii) (a) Black cotton soil. (b) N.A. (iii) 5.10 1951. (iv) (a) Bakharng. (b) N.A. (c) 80 lb/ac. (d) 14", (e) N.A. (v) N.L. (vi) As per treatments. (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2):
   (1) 2 varieties: V 1 = C-591 and V 2 = marvi E.K.D.
   (2) Soaking of seeds: D 0 = No soaking, D 1 = Soaked in water once, D 2 = Soaked in water twice, D 3 = Soaked in A/S, D 4 = Soaked in Ammo. Phos. and D 5 = Soaked in Potassium Phosphate.

3. DESIGN:
   (i) 2 x 6 Fact. in R.B.D. (ii) (a) N.A. (iii) 4. (iv) (a) 40' x 11'-8. (v) 35' x 7'. (vi) Two rows on both the sides and 2f of each row at both ends. (vi) Yes.

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

5. RESULTS:
   (i) 150 lb/ac.
   (ii) 45.10 lb/ac.
   (iii) Both V and D effects are highly significant while interaction is not significant.
   (iv) Av. yield of grain in lb/ac.

<table>
<thead>
<tr>
<th>V 1</th>
<th>D 0</th>
<th>D 1</th>
<th>D 2</th>
<th>D 3</th>
<th>D 4</th>
<th>D 5</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>167</td>
<td>155</td>
<td>186</td>
<td>80</td>
<td>56</td>
<td>69</td>
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<td>119</td>
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<td>189</td>
<td>164</td>
<td>208</td>
<td>186</td>
<td>169</td>
<td>167</td>
<td></td>
<td>180</td>
</tr>
</tbody>
</table>

   Mean: 178, 160, 197, 133, 112, 118, 150

   S.E. of V marginal means = 9.22 lb/ac.
   S.E. of D marginal means = 15.85 lb/ac.
   S.E. of body of table = 22.55 lb/ac.

Crop: Wheat.

Site: Govt. Exptl. Farm, Pusarkheda.

Object: To see the effect of Agroson G.N. on Wheat sown on different dates against foot-rot disease.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Clay loam (marviar). (b) Refer soil analysis, Pusarkheda. (iii) As per treatments. (iv) (a) Bakharng. (b) Drilling. (c) 80 lb/ac. (d) 12". (e) N.A. (f) N.A. (v) A-115 (medium). (vii) and (viii) N.A. (ix) 2.11. (x) 25.3.1949.

2. TREATMENTS:
   Main plot treatments:
   4 dates of sowing: D 1 = 21.10.1948, D 2 = 28.10.1948, D 3 = 11.11.1948 and D 4 = 15.11.1948.
   Sub-plot treatments:
   Treating of seeds: T 0 = Untreated seed and T 1 = Seed treated with agroson.
3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) and (b)
33'x16'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a) and (b)
N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 487.1 lb./ac.
(ii) (a) 82.64 lb./ac.
(b) 46.48 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D₁</th>
<th>D₂</th>
<th>D₃</th>
<th>D₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tᵢ</td>
<td>513.6</td>
<td>487.4</td>
<td>478.8</td>
<td>441.0</td>
<td>480.2</td>
</tr>
<tr>
<td>Tᵢ</td>
<td>501.2</td>
<td>501.8</td>
<td>491.2</td>
<td>482.2</td>
<td>494.1</td>
</tr>
<tr>
<td>Mean</td>
<td>507.4</td>
<td>494.6</td>
<td>485.0</td>
<td>461.6</td>
<td>487.1</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. D marginal means =41.32 lb./ac.
2. T marginal means =16.43 lb./ac.
3. T means at the same level of D =33.54 lb./ac.
4. D means at the same level of T =47.60 lb./ac.

Crop :- Wheat.
Site :- Govt. Exptl. Farm, Powarkheda.

Ref: - M.P. 49 (33).
Type :- 'CD'.

Object :- To see the effect of Agroson G.N. on Wheat sown on different dates against foot-rot disease.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Clay loam (marjurr). (b) Refer soil analysis, Powarkheda. (iii) As per treatments.
(iv) (a) Bakharising. (b) N.A. (c) 80 lb./ac. (d) N.A. (e) N.A. (v) N.A. (vi) A.115 (local). (vii) to
(ix) N.A. (x) 27.3.1950.

2. TREATMENTS:
Main-plot treatments :
Sub-plot treatments :
2 seed treatments : T₀= Untreated seeds and T₁=Seed treated with Agroson.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block and 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b)
33'x16'. (v) Nil. (vi) N.A.

4. GENERAL:
(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a) N.A. (b)
N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 357.7 lb./ac.
(ii) (a) 27.44 lb./ac.
(b) 12.84 lb./ac.
(iii) None of the effects is significant.
Crop: Wheat.  
Site: Govt. Exptl. Farm, Powarkheda.  
Object: To see the effect of Agrosan G. N. on Wheat sown on different dates against foot-rot disease.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Clay loam (Marpur). (b) Refer soil analysis, Powarkheda. (iii) As per treatments. (iv) (a) Bakharing. (b) Drilling. (c) 80 lb./ac. (d) and (e) N.A. (v) N.A. (vi) A. 115 (local). (vii) N.A. (viii) N.A. (ix) 2.11". (x) 25.3.1951.

2. TREATMENTS:
Sub-plot treatments: 2 seed treatments: T0= Untreated seed and T1= Seed treated with Agrosan G.N.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block, 2 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) and (b) 33'x16' (v) Nil. (vi) N.A.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1948 to 1950. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 485.8 lb./ac.  
(ii) (a) 35.28 lb./ac.  
(b) 17.00 lb./ac.  
(iii) Only D effect is significant.  
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>564.9</td>
<td>489.9</td>
<td>373.4</td>
<td>476.1</td>
</tr>
<tr>
<td>T1</td>
<td>580.1</td>
<td>498.2</td>
<td>408.3</td>
<td>495.5</td>
</tr>
<tr>
<td>Mean</td>
<td>572.5</td>
<td>494.1</td>
<td>390.8</td>
<td>485.8</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. D marginal means = 20.37 lb./ac.  
2. T marginal means = 8.01 lb./ac.  
3. T means at the same level of D = 13.88 lb./ac.  
4. D means at the same level of T = 22.60 lb./ac.
Site :- Govt. Seed and Demonstration Farm, Damoh.  Type : 'M'.

Object :- To study the effect of C/N on Jowar crop.

1. BASAL CONDITIONS : 
   (i) (a) Nil.  (b) Wheat. (c) Nil.  (ii) (a) Kharif.  (b)N.A.  (iii) 17,20,7,1951.  (iv) (a) Ploughing.  (b) Seed sown.  
   (c) 45 lb./ac.  (d) Rows 18° apart.  (e) N.A.  (v) Nil.  (vi) Local.  (vii) Unirrigated.  (viii) N.A.  (ix) 18.5°.  (x) 10.12.1953.

2. TREATMENTS : 
   1.  Control (2 plots/block).  5.  15 lb./ac of N as C/N.
   2.  15 lb./ac. of N as A/S.  6.  30 lb./ac. of N as C/N.
   3.  30 lb./ac. of N as A/S.  7.  45 lb./ac. of N as C/N.
   4.  45 lb./ac. of N as A/S.  8.  1 mad./ac. of G.N.C.+10 lb./ac. of N as A/S.

3. DESIGN : 
   (i) R.B.D.  (ii) (a) 9. (b) N.A.  (iii) 5. (iv) (a), (b) 30°-8°X21°-4°. (v) Nil. (vi) Yes.

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

5. RESULTS : 
   (i) 973 lb./ac.  (ii) 161.7 lb./ac.

Crop :- Jowar.  Ref :- M.P. 51(59).  
Site :- Central Res. Farm, Gwalior.  Type : 'M'.

Object :-To study the effect of A/S and Super on the growth and yield of Jowar.

1. BASAL CONDITIONS : 
   (i) (a) N.A.  (b) Gram.  (c) N.A.  (ii) (a) Sandy loam.  (b) Refer soil analysis, Gwalior.  (iii) 2.8.1951.  (iv) 
   (a) Desi ploughing and Bakhoring.  (b) N.A.  (c) N.A.  (d) 18°. (e) N.A.  (f) N.A.  (g) G. 12-2.  (vii) 

2. TREATMENTS : 
   All combinations of (1) and (2),  
   (1) 3 levels of P2O5 as Super : P1 =0, P2 =10 and P3 =20 lb./ac.  
   (2) 2 levels of N as A/S: N4 =0 and N5 =10 lb./ac.

3. DESIGN : 
   (i) 2x3 Fact. in R.B.D.  (ii) (a) 6. (b) N.A.  (iii) 6. (iv) 21'X96'. (b) 12'-90'. (v) Three rows on both sides and 
   3' of each row at both ends (vi) Yes.

4. GENERAL : 
   (i) Fair. (ii) N.A.  (iii) Grain and Kadbi yield.  (iv) (a) 1950-N.A.  (b), (c) N.A.  (v) (a), (b) N.A.  (vi) and 
   (vii) Nil.

5. RESULTS : 
   (i) 973 lb./ac.  (ii) 161.7 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1066</td>
<td>1000</td>
<td>933</td>
<td>1000</td>
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<tr>
<td>N₁</td>
<td>1080</td>
<td>906</td>
<td>853</td>
<td>946</td>
</tr>
<tr>
<td>Mean</td>
<td>1073</td>
<td>953</td>
<td>893</td>
<td>973</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 38.09 lb./ac.
S.E. of marginal mean of P = 46.64 lb./ac.
S.E. of body of table = 66.00 lb./ac.

Crop :- Jowar (Kharif).
Site :- Central Res. Farm, Gwalior.
Ref :- M.P. 52/62.
Type :- 'M1'.

Object :- To find out the response of Jowar to manuring with A/S and Super.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Sandy loam.  (b) Refer soil analysis, Gwalior.  (iii) 27.7.1952.  
(v) (a) Ploughing.  (b) Seeds drilled with 2 coultured seed drill.  (c) N.A.  (d) 18'.  
(c) N.A.  (v) N.A.  (v) G. 12-2.  
(vii) N.A.  (viii) 1 weeding and interculturing by Mayflower cultivator.  (ix) 22.60'.  
(x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of P₂O₅ : P₀ = 0 and P₁ = 20 lb./ac.
(2) 5 levels of N : N₀ = 0, N₁ = 10, N₂ = 20, N₃ = 30 and N₄ = 40 lb./ac.
N as A/S top dressed on 23.8.1952 and P₂O₅ as Super drilled on 27.7.1952 before sowing.

3. DESIGN:
(i) 2 x 5 Factor in R.B.D.  (ii) (a) 10.  (b) 56' x 180'.  (iii) 6.  
(iv) (a) 96' x 18'.  (b) 90' x 12'.  
(v) 2 rows on both sides and 3' of each row at both ends.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1952—1953.  (b) and (c) N.A.  
(v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 493.7 lb./ac.
(ii) 79.71 lb./ac.
(iii) P effect is highly significant. interaction NP is significant while N effect is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>Mean</th>
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<tr>
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<td>342.3</td>
<td>371.9</td>
<td>351.3</td>
<td>434.4</td>
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</tr>
<tr>
<td>P₁</td>
<td>654.6</td>
<td>569.4</td>
<td>542.2</td>
<td>573.5</td>
<td>616.3</td>
<td>597.2</td>
</tr>
<tr>
<td>Mean</td>
<td>513.4</td>
<td>470.7</td>
<td>446.8</td>
<td>503.9</td>
<td>555.6</td>
<td>493.7</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = ~3.01 lb./ac.
S.E. of marginal mean of P = ~14.55 lb./ac.
S.E. of body of table = ~32.54 lb./ac.
Crop : Jowar (Kharif).
Site : Central Res. Farm, Gwalior.
Object : To find out suitable manurial schedule for Jowar.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis. Gwalior. (iii) 21.7.1953. (iv) (a) N.A.
   (b) Seed drilled. (c) to (e) N.A. (v) N.A. (vi) G. 12-2 (early). (vii) Unirrigated. (viii) N.A. (ix)
   23.93. (x) N.A.

2. TREATMENTS :
   Main-plot treatments :
   5 levels of N as A/S: N 0 =0, N 1 =10, N 2 =20, N 3 =30 and N 4 =40 lb./ac.
   Sub-plot treatments :
   3 levels of P 2 O 5 as Super : P 0 =0, P 1 =20 and P 2 =40 lb./ac.

3. DESIGN :
   (i) Split-plot. (ii) (a) 5 main-plots/block; 3 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b)
   30' x 12'. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1953. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi)
   and (vii) Nil.

5. RESULTS :
   (i) 542 lb./ac.
   (ii) (a) 58.54 lb./ac.
   (b) 78.75 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N</th>
<th>N 1</th>
<th>N 2</th>
<th>N 3</th>
<th>N 4</th>
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</tr>
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<tbody>
<tr>
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<td>544</td>
<td>482</td>
<td>513</td>
</tr>
<tr>
<td>P 1</td>
<td>529</td>
<td>537</td>
<td>490</td>
<td>552</td>
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</tr>
<tr>
<td>P 2</td>
<td>529</td>
<td>653</td>
<td>692</td>
<td>638</td>
<td>591</td>
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</table>

Mean 506 547 575 557 526

S.E. of difference of two
1. N marginal means =23.00 lb./ac.
2. P marginal means =24.90 lb./ac.
3. P means at the same level of N =55.69 lb./ac.
4. N means at the same level of P =51.37 lb./ac.

Crop : Jowar.
Site : Central Exptl. Farm, Indore.
Object : To find a suitable dose of A/S and Super for Jowar.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Groundnut and onion. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 26.6.1951.
   (iv) (a) 2 bakharings. (b) and (c) N.A. (d) 14'. (e) N.A. (v) N.A. (vi) Jowar No. 3. (vii) Unirrigated.
   (viii) 3 hoeings. (ix) N.A. (x) 19.11.1951.

2. TREATMENTS:
   1. Control (no manure).
   2. 10 lb./ac. of N as A/S.
   3. 20 lb./ac. of N as A/S.
   4. 30 lb./ac. of N as A/S.
   5. 40 lb./ac. of N as A/S.
   6. 5 lb./ac. of P 2 O 5 as Super.
   7. 10 lb./ac. of P 2 O 5 as Super.
   8. Treat. 2+treat. 6.
   9. Treat. 2+treat. 7.
   10. Treat. 4+treat. 6.
   11. Treat. 4+treat. 7.
In 3 replications, the fertilizers were drilled with the seed and in the 3 replications it was applied a month after sowing. Hence the experiment has been taken as two experiments—one each for different times of application of manures.

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 3 for each time of application of fertilizers. (iv) (a) 21'×66'. (b) 14'×60'. (v) Three rows on either side and 3' of each row at both ends. (vi) Yes

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain and khaddi yield. (iv) (a) 1950 to N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Season was not favourable for the crop. (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Manure drilled with the seed</th>
<th>Manure applied a month after sowing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Av. yield</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>(i)</td>
<td>611.3 lb./ac.</td>
</tr>
<tr>
<td>(ii)</td>
<td>103.1 lb./ac.</td>
</tr>
<tr>
<td>(iii) Treatments do not differ significantly.</td>
<td>(iv) Av. yield of grain in lb./ac.</td>
</tr>
<tr>
<td>Treatment</td>
<td>Av. yield</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>1.</td>
<td>457.9</td>
</tr>
<tr>
<td>2.</td>
<td>544.3</td>
</tr>
<tr>
<td>3.</td>
<td>907.8</td>
</tr>
<tr>
<td>4.</td>
<td>619.9</td>
</tr>
<tr>
<td>5.</td>
<td>661.0</td>
</tr>
<tr>
<td>6.</td>
<td>570.2</td>
</tr>
<tr>
<td>7.</td>
<td>604.8</td>
</tr>
<tr>
<td>8.</td>
<td>609.1</td>
</tr>
<tr>
<td>9.</td>
<td>643.7</td>
</tr>
<tr>
<td>10.</td>
<td>563.8</td>
</tr>
<tr>
<td>11.</td>
<td>641.5</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 59.55 lb./ac.</td>
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Crop :- Jowar. Ref :- M.P.59(9).
Site :- Institute of Plant Industry, Indore. Type :-'M'.

Object :- To study the response to G.N.C. and P₂O₅ as Super applied singly and in combination.

1. BASAL CONDITIONS:
(i) (a) No. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.7.1970. (iv) (a) to (e) N.A. (v) Nil. (vi) Jowar No. 3. (vii) Unirrigated. (viii) and (ix) N.A. (x) 4.1.1951.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of N as G.N.C. : N₀ = 0 and N₁ = 20 lb./ac.
(2) 2 levels of P₂O₅ as Super : P₀ = 0 and P₁ = 20 lb./ac.

3. DESIGN:
(i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 23'4''×16'. (v) N.A. (vi) Yes.

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

5. RESULTS:
(i) 939 lb./ac.
(ii) 119.3 lb./ac.
(iii) Only N effect is highly significant.
### Basal Conditions

1. **Object:** To find out the response of Jowar to legume crops taken in combination with $P_2O_5$.

2. **Treatments:**
   - All combinations of (1) and (2)
   - (1) 2 levels of $P_2O_5$ as Super: $P_0=0$ and $P_1=30$ lb./ac.
   - (2) 11 G.M. crops: $G_0$=No crop, $G_1=$Dhaincha, $G_2=Moong_T1$, $G_3=Moong_sindhikhera$, $G_4=Sunhemp$, $G_5=Udid$, $G_6=Cowpea$, $G_7=Soyabean$, $G_8=Seabean$, $G_9=Guar$ and $G_{10}=Moong_local$.

3. **Design:**
   - (i) Fact. in R.B.D. (ii) 22. (b) N.A. (iii) 4. (iv) 65'-1'x18'-8'.
   - (v) Nearly 2'-1' on each side. (vi) Yes.

4. **General:**
   - (i) Normal. (ii) Nil. (iii) Grain yield. (iv) 1950 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. **Results:**
   - (i) 107.8 lb./ac.
   - (ii) 73.75 lb./ac.
   - (iii) None of the effects is significant.
   - (iv) Av. yield of grain in lb./ac.

---

<table>
<thead>
<tr>
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<th>$G_1$</th>
<th>$G_2$</th>
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<th>$G_5$</th>
<th>$G_6$</th>
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<td>93.2</td>
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<td>107.8</td>
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S.E. of marginal mean of P = 11.12 lb./ac.
S.E. of marginal mean of G = 26.08 lb./ac.
S.E. of body of table = 36.88 lb./ac.
Crop :- Jowar.  
Sit": Institute of Plant Industry. Indore.  
Object :-To study the response of different sources of N in combination with $P_2O_5$.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) 6.7.1953.  (iv) (a) Bakharing care.  (i) Drilled.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of $P_2O_5$ as Super: $P_0=0$ and $P_1=30$ lb./ac.
(2) 5 manures: $N_0=0$, $N_1=20$ lb./ac. of N as Potassium nitrate, $N_2=20$ lb./ac. of N as FYM, $N_3=20$ lb./ac. of N as farm compost and $N_4=20$ lb./ac. cf N as G.N.C.

3. DESIGN:
(i) 2 x 5 Fact. in R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 6.  (iv) (a) 60' x 11'.  (b) 55' x 7'.  (v) 2 rows on each side and 2/1 on each end.  (vi) Yes.

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

5. RESULTS:
(i) 949 lb./ac.
(ii) 115.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
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<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
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<td>975</td>
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<tr>
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<td>907</td>
<td>959</td>
<td>959</td>
<td>953</td>
<td>949</td>
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</tbody>
</table>

S.E. of marginal mean of N = 33.4 lb./ac.
S.E. of marginal mean of P = 21.1 lb./ac.
S.E. of body of table = 47 lb./ac.

---

Crop :- Jowar.  
Sit": Institute of Plant Industry. Indore.  
Object :-To study the response of different sources of N together with different doses of P on the yield of Jowar.

1. BASAL CONDITIONS:
(i) (a) No.  (b) and (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) 6.7.1953.  (iv) (a) one Bakharing.
(b) Drilled.  (c) 10 lb./ac. (d) Rows 14" apart. (c) N.A.  (v) Nil.  (vi) Jowar No. 3.  (vii) Unirrigated.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of $P_2O_5$ as Super: $P_0=0$ and $P_1=30$ lb./ac.
(2) 5 manures: $N_0=0$, $N_1=20$ lb./ac. of N as Potassium nitrate $N_2=20$ lb./ac. of N as FYM $N_3=20$ lb./ac. of N as farm compost and $N_4=20$ lb./ac. of N as G.N.C.

3. DESIGN:
(i) 2 x 5 Fact. in R.B.D.  (ii) (a) 10.  (b) N.A.  (iii) 6.  (iv) (a) 60' x 108'.  (b) 55' x 7'.  (v) 2 rows on each side and 2/1 on each end.  (vi) Yes.
4. GENERAL:
(i) Normal. (ii) Nil. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 1011 lb./ac.
(ii) 137.1 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
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<tr>
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<th>$N_0$</th>
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<td>$P_1$</td>
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<td>1011</td>
<td>1112</td>
<td>1001</td>
<td>1021</td>
<td>1026</td>
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<tr>
<td>Mean</td>
<td>959</td>
<td>998</td>
<td>1115</td>
<td>991</td>
<td>993</td>
<td>1011</td>
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S.E. of marginal mean of P = 25.0 lb./ac.
S.E. of marginal mean of N = 39.6 lb./ac.
S.E. of body of table = 56.0 lb./ac.

Crop := Jowar (Kharif),
Site := Institute of Plant Industry, Indore.
Ref := M.P. 49(15).
Type := 'M'.

Object := To study the residual effect of different crops treated with different doses of N and P singly and in combination on Jowar.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Bakharings, (b) N.A. (c) N.A. (d) 14'. (e) N.A. (v) Nil. (vi) Jowar No. 3. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
Main-plot treatments:
3 previous crops: $C_1$ = Wheat, $C_2$ = Linseed and $C_3$ = Gram.
Sub-plot treatments:
All combinations of (1) and (2)
(1) 3 levels of N as A/S: $N_0$ = 0, $N_1$ = 20 and $N_2$ = 40 lb./ac.
(2) 3 levels of $P_2O_5$ as Super: $P_0$ = 0, $P_1$ = 20 and $P_2$ = 40 lb./ac.
N and P applied to the main-plot treatments crops; residual effect studied on Jowar.

3. DESIGN:
(i) Split-plot. (ii) (a) 3 main-plots/block; 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 14'8" x 35'. (b) 10' x 30'. (v) 2 rows on both the sides and 2' of each row at both ends. (vi) Yes.

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

5. RESULTS:
(i) 506.8 lb./ac.
(ii) 136.2 lb./ac.
(b) 117.8 lb./ac.
(iii) C and N effects are highly significant, interaction C X N is significant while other effects are not significant.
Crop: Jowar (Kharif),
Site: Institute of Plant Industry, Indore.

Object: To study the residual effect of the application of N and P singly and in combination to previous Rabi crops on Jowar.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b), (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.7.1949. (iv) (a) bakharing. (b), (c) N.A. (d) 14". (e) N.I. (f) Nil. (v) Jowar No. 3. (vi) N.A. (vii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   Main-plot treatments: 3 previous crops: C₁=Wheat, C₂=Linseed and C₃=Gram.
   Sub-plot treatments:
   All combinations of (i) and (ii)
   1. 3 levels of N as A/S: N₀=0, N₁=20 and N₂=40 lb./ac.
   2. 3 levels of P₂O₅ as super: P₀=0, P₁=20 and P₂=40 lb./ac.
   N and P applied to the main-plot treatments crops. Residual effect on Jowar.

3. DESIGN:
   (i) Split-plot. (ii) (a) 3 main plots/replication and 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 14.8"x35" (b) 10"x30". (v) 2 rows on both sides and 2' of each row at both ends. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Jowar grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 50.7 lb./ac.
   (ii) (a) 117.8 lb./ac.
   (b) 116.0 lb./ac.
   (iii) Interaction C×N alone is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
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<th>P0</th>
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<td>545.4</td>
<td>524.1</td>
<td>552.7</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. C marginal means = 22.68 lb./ac.
2. N or P marginal means = 22.33 lb./ac.
3. N or P means at the same level of C = 38.67 lb./ac.
4. C means at the same level of N or P = 38.75 lb./ac.

Crop: Jowar,
Site: Institute of Plant Industry Indore.
Object: To find out the residual effect of green manuring and growing catch crops like Moong and Udid preceding wheat on the yield of Jowar grain and straw following wheat.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) G.M. and catch crops moong and Udid preceding wheat and wheat in 1950-1951. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.7.1951. (iv) (a) Bukharing. (b) to (e) N.A. (v) N.A. (vi) N.A. (vii) N.A. (viii) weed. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of P2O5 as Super: P0 = 0 and P1 = 30 lb./ac.
   (2) 4 previous crops: G0 = Fallow, G1 = Sam, G2 = Moong and G3 = Udid.

3. DESIGN:
   (i) R.B.D. (ii) 8 (b) N.A. (iii) 6. (iv) (a) N.A. (b) 55'x14'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Fodder and grain yield. (iv) (a) 1948—N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 790 lb./ac.
   (ii) 160.7 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>G0</th>
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<th>G3</th>
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<td>839</td>
<td>728</td>
<td>790</td>
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S.E. of marginal mean of G = 66.4 lb./ac.
S.E. of marginal mean of P = 32.8 lb./ac.
S.E. of body of table = 65.6 lb./ac.
Crop :- Jowar.  
Site :- Institute of Plant Industry, Indore.

Object :- To study the residual effect of G.M. or catch crop grown before sowing Wheat.

1. BASAL CONDITIONS :
   (i) [a] No. (b) Wheat. (c) As per treatments. (ii) [a] Black cotton soil. (b) N.A. (iii) 2.7.1952. (iv) (a) 2 bakharings. (b) to (c) N.A. (v) N.A. (vi) Jowar no. 3 (early). (vii) Unirrigated. (viii) 1 sowing. (ix) 16.9". (x) 12.11.1952 and 11.12.1952.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 5 green manure crops : G0=Fallow, G1=Sann, G2=maung, G3=Udid and G4=swaleam.
   (2) 2 levels of P2O5 as Super : P0=0 and P1=30 lb./ac.
   Treatments applied to wheat crop. Residual effect studied.

3. DESIGN :
   (i) 5 x 2 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 3. (iv) (a) 60' x 23'. (b) 55' x 18'. (v) 2.5' around. (vi) Yes.

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

5. RESULTS :
   (i) 1626 lb./ac. 
   (ii) 296.4 lb./ac. 
   (iii) Only main effect of G is significant. 
   (iv) Av. yield of grain in lb./ac.

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<tr>
<th></th>
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S.E. of marginal mean of G = 0.53 lb./ac. 
S.E. of marginal mean of P = 6.64 lb./ac. 
S.E. of body of table = 44.2 lb./ac.

Crop :- Jowar.  
Site :- Institute of Plant Industry, Indore.

Object :- To study the effect of graded doses of N and P singly and in combination.

1. BASAL CONDITIONS :
   (i) [a] to [c] N.A. (ii) [a] Black cotton soil. (b) N.A. (iii) 3.7.1949. (iv) (a) Bakharings. (b) and (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) Jowar No. 3. (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N0=0, N1=20 and N2=40 lb./ac.
   (2) 3 levels of P2O5 as Super : P0=0, P1=20 and P2=40 lb./ac.

3. DESIGN :
   (i) 3 x 3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) [a] 14' x 35'. (b) 10' x 30'. (v) 2' x 24'. (vi) Yes.

4. GENERAL :
   (i) Good. (ii) N.A. (iii) Grain and fodder yield. (iv) [a] to [c] N.A. (v) [a] and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 570.4 lb./ac.
(ii) 139.7 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>605.8</td>
<td>540.5</td>
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<tr>
<td>P₁</td>
<td>487.7</td>
<td>646.2</td>
<td>756.9</td>
<td>630.3</td>
</tr>
<tr>
<td>P₂</td>
<td>357.5</td>
<td>453.3</td>
<td>810.8</td>
<td>540.5</td>
</tr>
<tr>
<td>Mean</td>
<td>422.8</td>
<td>563.9</td>
<td>724.5</td>
<td>570.4</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 33.0 lb./ac.
S.E. of body of table     = 57.0 lb./ac.

Crop :- Jowar.
Site :- Institute of Plant Industry, Indore.

Ref :- M.P. 48 (5).
Type 'M'.

Object :- To study the effect on Jowar of the application of different doses of N and P singly and in combination.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) N.A.  (iv) (a) to (c) N.A.  (v) N.A.  (vi) N.A.  (vii) N.A.  (viii) Weeding.  (ix) N.A.  (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as G.N.C. : N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
   (2) 3 levels of P₂O₅ as Super : P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.

3. DESIGN:
   (i) 3 x 3 Fact. in R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) 15" x 35".  (b) 10" x 30".  (v) 2 rows on both sides and 2½' of each row at both ends.  (vi) Yes.

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

5. RESULTS:
   (i) 560.04 lb./ac.
   (ii) 271.02 lb./ac.
   (iii) Only N effect is highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
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<tr>
<td>P₀</td>
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<td>666.2</td>
<td>513.5</td>
<td>489.0</td>
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<tr>
<td>P₁</td>
<td>362.3</td>
<td>778.4</td>
<td>714.1</td>
<td>618.3</td>
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<tr>
<td>P₂</td>
<td>438.6</td>
<td>513.5</td>
<td>766.5</td>
<td>572.8</td>
</tr>
<tr>
<td>Mean</td>
<td>362.8</td>
<td>652.7</td>
<td>664.7</td>
<td>560.0</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 63.85 lb./ac.
S.E. of body of table     = 110.63 lb./ac.
Crop: Jowar.

Site: Industry of Plant Industry, Indore.

Object:—To find out the effect of application of P₂O₅ and compost in various combinations on the yield of Jowar.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.6.1951. (iv) a. Baksharing. (b) cotton soil. (c) N.A. (d) 14. (e) N.A. (f) N.A. (v) N.A. (vi) Jowar no. 3. (vii) N.A. (viii) Thinning on 6.7.1951 and weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 2 levels of compost : C₀=0 and C₁=compost (quantity N.A.)
   (2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=2 lb./ac.
   (3) 2 levels of N as A/3 : N₀=0 and N₁=2 lb./ac.

3. DESIGN:
   (i) Fact. in R.B.D. (ii) 8. (b) N.A. (iii) 6. (iv) (a) 26'×14'. (y) 26' 4'×10'. (v) 2 rows on both sides and 2 feet of each row at both ends (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1951 to N.A. (b) N.A. (c) N.A. (d) N.A. (e) N.A. (f) N.A. (v) and (vii) Nil.

5. RESULTS:
   (i) 575.0 lb./ac.
   (ii) 168.4 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C₀</th>
<th>C₁</th>
<th>Mean</th>
<th>P₀</th>
<th>P₁</th>
</tr>
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<td>558.2</td>
<td>585.4</td>
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<td>Mean</td>
<td>562.0</td>
<td>688.1</td>
<td>575.6</td>
<td>574.1</td>
<td>575.9</td>
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<tr>
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<td>617.2</td>
<td>575.6</td>
<td>574.1</td>
<td>575.9</td>
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<tr>
<td>P₁</td>
<td>592.9</td>
<td>559.9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 34.2 lb./ac.
S.E. of body of table = 48.7 lb./ac.

Crop: Jowar.

Site: Govt. Exp'l. Farm, Khandwa.

Object:—To study the effect of different manures on the yield of Jowar.

1. BASAL CONDITIONS:

2. TREATMENTS:
   1. 15 lb./ac. of N as oil cake.
   2. 15 lb./ac. of N as A/S.
   3. 15 lb./ac. of N as decorticated cotton seed cake.
   4. 15 lb./ac. of N as undecorticated cotton seed cake.
   5. Control (no manure).
Crop: Jowar.  
Site: Govt. Exptl. Farm, Khandwa.  
Object: To study the effect of nitrogenous manures both organic and inorganic singly and in combination on Jowar.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Cotton. (c) Nil.  
   (ii) (a) Medium black cotton soil. (b) N.A. (iii) 10.7.1950.  
   (iv) (a) Bakharing, (b) Sown by tiffin. (c) to (e) N.A.  
   (v) N.A.  

2. TREATMENTS:
   1. Control,
   2. 15 lb./ac. of N as F.Y.M.
   3. 15 lb./ac. of N as T.C.
   4. 15 lb./ac. of N as farm compost.
   5. 15 lb./ac. of N as A/S.
   6. 15 lb./ac. of N as F.Y.M. and A/S in 1:1 ratio.
   7. 15 lb./ac. of N as T.C. and A/S in 1:1 ratio.
   8. 15 lb./ac. of N as F.C. and A/S in 1:1 ratio.

Manures applied on 6.7.1950 and 7.7.1950.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4.  
   (iv) (a) 68'X18'/. (b) 66'X16'. (v) 1' around. (vi) No.

4. GENERAL:
   (i) Satisfactory.  
   (ii) Nil. (iii) Grain and &kadi yield. (iv) (a) No. (b) and (c)—. (v) (a) Nil. (b) N.A. (vi) & (vii) Treatments are not randomised.

5. RESULTS:
   (i) 745.9 lb./ac.  
   (ii) 62.3 lb./ac.  
   (iii) Treatment differences are highly significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>532.5</td>
<td>5.</td>
<td>815.0</td>
</tr>
<tr>
<td>2.</td>
<td>797.5</td>
<td>6.</td>
<td>765.0</td>
</tr>
<tr>
<td>3.</td>
<td>785.0</td>
<td>7.</td>
<td>727.5</td>
</tr>
<tr>
<td>4.</td>
<td>797.5</td>
<td>8.</td>
<td>747.5</td>
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</tbody>
</table>

S.E./mean = 31.1 lb./ac.
Crop: Jowar.
Site: Govt. Exptl. Farm, Khandwa.
Object: To study the effect of different sources and doses of N on Jowar yield.

1. BASAL CONDITIONS:
   (i) Nil.
   (ii) Cotton.
   (iii) Medium black cotton soil.
   (iv) Sown by tifton.
   (v) Rained on 1st June.
   (vi) Ungrooted.
   (vii) Hoeing and weeding.
   (viii) 29.39°.
   (ix) 22.12.

2. TREATMENTS:
   7 manures: M0 = 0 (control), M1 = 10 C.L./ac. of T.C., M2 = 20 C.L./ac. of T.C., M3 = 10 C.L./ac. of F.Y.M., M4 = 20 C.L./ac. of F.Y.M., M5 = 4 md./ac of G.N.C. and M6 = 4 md./ac of A/S.
   Manures applied on 5 and 7.7.1950.

3. DESIGN:
   (i) R.B.D.
   (ii) 7.
   (iii) 4.

4. GENERAL:
   (i) Satisfactory.
   (ii) Nil.
   (iii) Grain yield.
   (iv) (a) to (c) Nil.
   (v) (a) Nil.
   (vi) Nil.

5. RESULTS:
   (i) 1008 lb./ac.
   (ii) 97.7 lb./ac.
   (iii) Treatment differences are significant.
   (iv) Av. yield of grain in lb./ac.
   Treatment | Av. yield
   -----------|-----------
   M0         | 835
   M1         | 1033
   M2         | 1133
   M3         | 1030
   M4         | 1035
   M5         | 968
   M6         | 1020
   S.E./mean  | 48.9 lb./ac.

———

Crop: Jowar (Kharij).
Site: Govt. Exptl. Farm, Khandwa.
Object: To study the effect of T.C. with other organic measures and ascertain the optimum dose.

1. BASAL CONDITIONS:
   (i) (a) N.A.
   (b) Cotton.
   (c) No. (i) [a] Medium black cotton soil. (b) N.A. (ii) 8.7.1950. (v) (a) 20. (b) Sown by tifton. (c) to (e) N.A. (vii) Nil. (viii) 17.
   (ix) Hoeing and weeding. (x) 29.39°. (xi) 22.12.

2. TREATMENTS:
   7 manures: M0 = 0 (control), M1 = 10 C.L./ac. of T.C., M2 = 20 C.L./ac. of T.C., M3 = 10 C.L./ac. of F.Y.M., M4 = 20 C.L./ac. of F.Y.M., M5 = 4 md./ac of G.N.C. and M6 = 4 md./ac of A/S.
   Manures applied on 5 and 7.7.1950.

3. DESIGN:
   (i) R.B.D.
   (ii) 7.
   (iii) 4.

4. GENERAL:
   (i) and (ii) N.A.

5. RESULTS:
   (i) 1306 lb./ac.
   (ii) 289.4 lb./ac.
   (iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

Control = 1044 lb./ac.

<table>
<thead>
<tr>
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<td>1240</td>
<td>1234</td>
<td>1271</td>
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<td>$S_2$</td>
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<td>1294</td>
<td>1419</td>
<td>1341</td>
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<tr>
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<td>1325</td>
<td>1267</td>
<td>1326</td>
<td>1306</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of $N$ = 91.2 lb./ac.
S.E. of marginal mean of $S$ = 74.5 lb./ac.
S.E. of body of table = 129.0 lb./ac.

Crop := Jowar.
Ref := M.P. 52 (18).
Site := Govt. Seed and Demonstration Farm, Saugor. Type := 'M'.

Object := To study the effect of cotton seed cake in comparison with other fertilizers on Jowar.

1. BASAL CONDITIONS:
   (i) (a) to (c). (ii) (a) Kabar 2. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (d) 18"×12". (e) N.A. (v) to (x) N.A.

2. TREATMENTS:
   1. Control (no manure).
   2. G.N.C.
   3. A/S.
   4. Decorticated cotton seed cake.
   5. Undecorticated cotton seed cake.
   Quantity of fertilizers applied not available.

3. DESIGN:
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 33"×16'/. (b) 30'×16'. (v) One row on both sides of breadth. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A.
   (vi) Nil. (vii) Transplanting of Jowar is not practiced in this tract. This had to be adopted as special measure to save the experiment from complete failure. Due to continuous rains after sowing the germination was very poor. Hence the healthy plants from non-experimental crop were transplanted which proved a success.

5. RESULTS:
   (i) 531.6 lb./ac.
   (ii) 214.7 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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</tr>
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<td>2.</td>
<td>442.6</td>
</tr>
<tr>
<td>3.</td>
<td>412.3</td>
</tr>
<tr>
<td>4.</td>
<td>621.3</td>
</tr>
<tr>
<td>5.</td>
<td>679.1</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>107.4 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Jowar.  
Site :- Govt. Seed and Demonstration Farm, Saugar.  
Object :- To study the manurial value of cotton seed cake for production of Jowar.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  
   (ii) (a) Kabar 2. (b) N.A.  
   (iii) 9.7.1953.  
   (iv) (a) to (c) N.A.  
   (v) N.A.  
   (vi) White bedra (local).  
   (vii) N.A.  
   (viii) Weeding, spraying and mulching.  
   (ix) N.A.  
   (x) 17.12.1953.

2. TREATMENTS :
   1. Control (no manure).  
   2. Q.N.C.  
   3. A/S.  
   4. Fertilizer mixture.  
   5. Decorticated cotton seed cake.  
   6. Undecorticated cotton seed cake.

   Quantity of various manures — N.A.

3. DESIGN :
   (i) R.B.D.  
   (ii) 6. (b) N.A.  
   (iii) 5. (a) and (b) 33' x 33'.  
   (iv) Nil.  
   (v) Yes.

4. GENERAL :
   (i) Fair.  
   (ii) N.A.  
   (iii) Grain yield.  
   (iv) (a) No. (b) and (c).  
   (v) N.A.  
   (vi) NIL.

5. RESULTS :
   (i) 1020 lb./ac.  
   (ii) 1232 lb./ac.  
   (iii) Treatments differ highly significantly.

   Av. yield of grain in lb./ac.

   Treatment  | Av. yield  | S.E./mean
   1.          | 933        | =67.8 lb./ac.
   2.          | 966        |  
   3.          | 1316       |  
   4.          | 1016       |  
   5.          | 964        |  
   6.          | 1047       |  

Crop :- Jowar.  
Site :- Govt. Seed and Demonstration Farm, Saugar.  
Object :- To study the effect of C/N on Jowar.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.  
   (ii) (a) Kabar 2. (b) N.A.  
   (iii) 9.7.1953.  
   (iv) (a) N.A.  
   (b) Seeds drilled. (c) N.A.  
   (d) Rows 18" apart. (e) N.A.  
   (f) N.A.  
   (g) White bedra (local).  
   (h) to (i) N.A.  
   (j) 4.12.1953.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 4 levels of N : N0 = 0, N1 = 15, N2 = 30 and N3 = 45 lb./ac.
   (2) 2 sources of N : S1 = A/S and S2 = C/N.

3. DESIGN :
   (i) 2 x 4 Fact. in R.B.D.  
   (ii) 8. (b) N.A.  
   (iii) 5. (iv) (a) and (b) 33' x 33'. (v) NIL. (vi) Yes.

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

5. RESULTS :
   (i) 798 lb./ac.  
   (ii) 190.8 lb./ac.
(iii) Control vs. treated and N effects are highly significant. Other effects are not significant. (iv) Av. yield of grain in lb./ac.

Control $= \overline{496}$ lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$N_1$</th>
<th>$N_2$</th>
<th>$N_3$</th>
<th>Mean</th>
</tr>
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<td>916</td>
<td>843</td>
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<tr>
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<td>746</td>
<td>876</td>
<td>1074</td>
<td>899</td>
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</table>

S.E. of marginal mean of $S$ = 49.2 lb./ac.
S.E. of marginal mean of $N$ = 60.4 lb./ac.
S.E. of body of table = 85.2 lb./ac.

---

Crop: Jowar.

Site: Central Res. Farm, Ujjain.

Object: To find a suitable dose of A/S for Jowar.

1. BASAL CONDITIONS:

(i) (a) No. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 5.7.1951. (iv) (a) Four bakharings. (b) and (c) N.A. (d) Rows 18" apart. (e) N.A. (v) 5 C.L./ac. of F.Y.M. broadcasted on 20.6.1951 just before fourth bakharing. (vi) Ujjain No. 6 (late). (vii) Unirrigated. (viii) Dora. (ix) N.A. (x) 16, 19.11.1951.

2. TREATMENTS:

1. Control (no manure).
2. 10 lb./ac. of $N$.
3. 20 lb./ac. of $N$.
4. 30 lb./ac. of $N$.
5. 40 lb./ac. of $N$.
6. 5 lb./ac. of $P_2O_5$.
In 3 blocks, fertilizers were drilled in furrows with seed and in remaining 3 blocks fertilizers were applied as top dressing 3 to 4 weeks after germination. $N$ applied as A/S and $P_2O_5$ as Super.

3. DESIGN:

(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 6. (iv) (a) $21\times66'$. (b) $12\times60'$. (v) $4.5\times3'$. (vi) Ycs.

4. GENERAL:

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

5. RESULTS:

(i) 64.7 lb./ac.
(ii) 128.2 lb./ac.
(iii) Treatments differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>544.3</td>
<td>7.</td>
<td>535.4</td>
</tr>
<tr>
<td>2.</td>
<td>675.4</td>
<td>8.</td>
<td>590.8</td>
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<td>3.</td>
<td>738.4</td>
<td>9.</td>
<td>577.1</td>
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<td>4.</td>
<td>758.5</td>
<td>10.</td>
<td>682.9</td>
</tr>
<tr>
<td>5.</td>
<td>469.9</td>
<td>11.</td>
<td>595.9</td>
</tr>
<tr>
<td>6.</td>
<td>603.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 52.3 lb./ac.
Object: To find suitable seed rate and manurial dose for Jowar.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 30.6.1948. (iv) (a) Bakharing. (b) N.A. (c) As per treatments. (d) 14". (e) N.A. (v) N.A. (vi) Jowar No. 3. (vii) N.A. (viii) Weeding and thinning. (ix) N.A. (x) 6.12.1948.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 6 seed rates: R₁ = 10 lb./ac. (thinned), R₂ = 5, R₃ = 10, R₄ = 15, R₅ = 20 and R₆ = 25 lb./ac.
   (2) 2 levels of N as A/S: N₀ = 0 and N₁ = 20 lb./ac.

3. DESIGN:
   (i) 2 x 6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) 14' x 30'. (b) 9' x 45'. (v) Two rows on both sides and 2' feet of each row at both ends. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain and stalk yield. (iv) (a) 1947 to 1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 517.8 lb./ac.
   (ii) 145.0 lb./ac.
   (iii) R effect is significant, N effect is highly significant while interaction is not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>R₁</th>
<th>R₂</th>
<th>R₃</th>
<th>R₄</th>
<th>R₅</th>
<th>R₆</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>611.6</td>
<td>403.1</td>
<td>543.6</td>
<td>455.0</td>
<td>430.1</td>
<td>378.2</td>
</tr>
<tr>
<td>N₁</td>
<td>584.6</td>
<td>600.9</td>
<td>620.3</td>
<td>626.8</td>
<td>531.7</td>
<td>428.0</td>
</tr>
<tr>
<td>Mean</td>
<td>598.1</td>
<td>502.0</td>
<td>581.9</td>
<td>540.9</td>
<td>480.9</td>
<td>403.1</td>
</tr>
</tbody>
</table>

   S.E. of marginal mean of N = 24.2 lb./ac.
   S.E. of marginal mean of R = 41.9 lb./ac.
   S.E. of body of table = 58.6 lb./ac.
4. GENERAL:
   (i) and (ii) N.A. (iii) Grain and fodder yield. (iv) (a) 1947 to 1949, (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 462.1 lb./ac.
   (ii) 143.0 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>R_1</th>
<th>R_2</th>
<th>R_3</th>
<th>R_4</th>
<th>R_5</th>
<th>R_6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>497.4</td>
<td>490.3</td>
<td>495.0</td>
<td>470.3</td>
<td>396.0</td>
<td>260.5</td>
<td>434.9</td>
</tr>
<tr>
<td>N₁</td>
<td>543.3</td>
<td>574.0</td>
<td>541.0</td>
<td>465.5</td>
<td>388.9</td>
<td>423.1</td>
<td>489.3</td>
</tr>
<tr>
<td>Mean</td>
<td>520.3</td>
<td>532.1</td>
<td>518.0</td>
<td>467.9</td>
<td>392.5</td>
<td>341.8</td>
<td>462.1</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 23.8 lb./ac.
S.E. of marginal mean of R = 41.2 lb./ac.
S.E. of body of table = 58.3 lb./ac.

Crop: Jowar.  Ref: M.P. 50 (16).
Site: Institute of Plant Industry, Indore.  Type: 'CM'.

Object: To find out the optimum seed rate for Jowar with and without manuring.

1. BASAL CONDITIONS:
   (i) (a) No, (b) No. (c) N.A. (ii) (a) Black cotton soil, (b) N.A. (iii) 18.7.1950. (iv) (a) to (c) N.A. (v) Nil. (vi) Jowar No 3. (vii) Unirrigated. (viii) Nil. (ix) N.A. (x) 22.1.1951.

2. TREATMENTS:
   1. 10 lb./ac. of seed rate (thinned) + 0 lb./ac of N as A/S.
   2. 10 lb./ac. of seed rate (thinned) + 20 lb./ac. of N as A/S.
   3. 10 lb./ac. of seed rate (Unthinned) + 0 lb./ac as N A/S.
   4. 10 lb./ac. of seed rate (Unthinned) + 20 lb./ac. as N A/S.
   5. 15 lb./ac. of seed rate (Unthinned) + 0 lb./ac. as N A/S.
   6. 15 lb./ac. of seed rate (Unthinned) + 20 lb./ac. as N A/S.

3. DESIGN:
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6 (iv) (a) 14' x 66'. (b) 9'4" x 55'. (v) 2' on each side. (vi) Yes.

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

5. RESULTS:
   (i) 793.0 lb./ac.
   (ii) 56.35 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>792</td>
</tr>
<tr>
<td>2.</td>
<td>979</td>
</tr>
<tr>
<td>3.</td>
<td>789</td>
</tr>
<tr>
<td>4.</td>
<td>792</td>
</tr>
<tr>
<td>5.</td>
<td>723</td>
</tr>
<tr>
<td>6.</td>
<td>685</td>
</tr>
</tbody>
</table>

S.E./mean = 23.00 lb./ac.
Crop: Jowar.
Site: Institute of Plant Industry, Indore.

Object: To study the effect of N with pre-monsoon and monsoon sowings on Jowar yield.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) No. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Bakthad once. (b) Drilled. (c) 10 lb./ac. (d) Rows 14" apart. (e) N.A. (v) No. (iv) Jowar no. 3. (vii) Unirrigated. (viii) 2 hand weeding followed by interculture with dura. (ix) N.A. (x) M 1 on 4.12.1953 and M 2 on 19.12.1953.

2. TREATMENTS:
   Main-plot treatments.
   2 sowings: M 1 = Pre-monsoon and M 2 = Monsoon sowing.

   Sub-plot treatments.
   4 levels of N as A/S: N 0 = 0, N 1 = 10, N 2 = 20 and N 3 = 30 lb./ac.

3. DESIGN:
   (i) Split-plot (ii) (a) 2 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 50' x 21'. (b) 45' x 16'. (v) 21' on each side of the plot. (vi) Yes.

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

5. RESULTS:
   (i) 853 lb./ac.
   (ii) (a) 178.9 lb./ac.
   (b) 165.0 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N 0</th>
<th>N 1</th>
<th>N 2</th>
<th>N 3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1</td>
<td>783</td>
<td>898</td>
<td>813</td>
<td>972</td>
<td>866</td>
</tr>
<tr>
<td>M 2</td>
<td>798</td>
<td>752</td>
<td>921</td>
<td>888</td>
<td>840</td>
</tr>
<tr>
<td>Mean</td>
<td>750</td>
<td>825</td>
<td>867</td>
<td>930</td>
<td>853</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means = 63.3 lb./ac.
2. N marginal means = 82.5 lb./ac.
3. N means at the same level of M = 116.6 lb./ac.
4. M means at the same level of N = 118.8 lb./ac.

Crop: Jowar.
Site: Institute of Plant Industry, Indore.

Ref: M.P. 52(7). Type: 'CMV'.

Object: To study the effect of graded doses of N on the yield of Jowar sown dry (pre-monsoon) and normal after rains.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Wheat. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) to (c) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 1 thinning. (ix) 26.6.52. (x) 11, 29.11.1952 and 5.12.1952.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 5 levels of N as A/S: N 0 = 0, N 1 = 5, N 2 = 10, N 3 = 15 and N 4 = 20 lb./ac.
   (2) 2 varieties: V 1 = Jowar No. 3 and V 2 = Jowar No. 6.
   (3) 5 dates of sowing: D 1 = pre-monsoon sowing on 10.6.1952 and D 2 = monsoon sowing on 26.6.1952.

3. DESIGN:
   (i) 5 x 2 x 2. (ii) (a) 20. (b) N.A. (iii) 4. (iv) (a) 60' x 11' 8". (b) 55' x 17'. (v) 21' on either side. (vi) Yes.
4. GENERAL:

(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1952 to 1955. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 914 lb./ac.
(ii) 154.5 lb./ac.
(iii) Only V and D effects are highly significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N&lt;sub&gt;0&lt;/sub&gt;</th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&lt;sub&gt;3&lt;/sub&gt;</th>
<th>N&lt;sub&gt;4&lt;/sub&gt;</th>
<th>Mean</th>
<th>D&lt;sub&gt;1&lt;/sub&gt;</th>
<th>D&lt;sub&gt;2&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>V&lt;sub&gt;1&lt;/sub&gt;</td>
<td>939</td>
<td>929</td>
<td>1040</td>
<td>992</td>
<td>1051</td>
<td></td>
<td>990</td>
<td>1072</td>
</tr>
<tr>
<td>V&lt;sub&gt;2&lt;/sub&gt;</td>
<td>831</td>
<td>760</td>
<td>825</td>
<td>862</td>
<td>906</td>
<td></td>
<td>837</td>
<td>867</td>
</tr>
<tr>
<td>Mean</td>
<td>885</td>
<td>844</td>
<td>933</td>
<td>927</td>
<td>978</td>
<td></td>
<td>914</td>
<td>970</td>
</tr>
<tr>
<td>D&lt;sub&gt;1&lt;/sub&gt;</td>
<td>941</td>
<td>831</td>
<td>1032</td>
<td>981</td>
<td>1061</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D&lt;sub&gt;2&lt;/sub&gt;</td>
<td>828</td>
<td>858</td>
<td>833</td>
<td>872</td>
<td>895</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 38.6 lb./ac.
S.E. of marginal mean of V or D = 24.4 lb./ac.
S.E. of body of N×V or N×D table = 54.6 lb./ac.
S.E. of body of V×D table = 34.6 lb./ac.

Crop : Jowar.
Site : Govt. Exptl. Farm, Powarkheda.
Ref : M.P. 48(27).
Type : 'D'.

Object : To study the efficiency of different treatments of seeds on the incidence of Jowar smut.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Clay loam (mariyar). (b) Refer soil analysis, Powarkheda. (iii) 21, 22.6.1948.
(iv) (a) Bakharing. (b) Drilling. (c) N.A. (d) 18'. (e) N.A. (v) N.A. (vi) and (vii) N.A. (viii) 1 interculture, 1 weeding and 1 gap-filling. (ix) N.A. (a) 7.12.1948.

2. TREATMENTS:

1. Control.
2. Seed treated with copper carbonate.
3. Seed treated with sulphur.
4. Seed soaked in water and dried in shade.
5. Seed soaked and dried in sun slice.

3. DESIGN:

(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) and (b) 16'×66'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain and straw yield. (iv) (a) 1944 to 1950. (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) Grain was slightly damaged and blackened due to late rains. (vii) Crop failed during year, 1949.

5. RESULTS:

(i) 400.5 lb./ac.
(ii) 62.56 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>442.5</td>
</tr>
<tr>
<td>2.</td>
<td>422.5</td>
</tr>
<tr>
<td>3.</td>
<td>379.0</td>
</tr>
<tr>
<td>4.</td>
<td>369.0</td>
</tr>
<tr>
<td>5.</td>
<td>389.0</td>
</tr>
</tbody>
</table>

S.E./mean = 27.96 lb./ac.
Crop: Jowar.  
Site: Govt. Exptl. Farm, Powarkheda.  
Ref: M.P. 50 (34).  
Type: 'D'.

Object: To study the efficiency of different treatments of seed on the incidence of Jowar smut.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) clay loam (marlyar).  (b) Refer soil analysis, Powarkheda.  (iii) 13.7.1950.  (iv) 'a' Bakharling.  (b) Drilling 18".  (c) to (e) N.A.  (v) N.A.  (vi) N.A.  (vii) N.A.  (viii) Interculture on 18, 26.8.1951.  (ix) N.A.  (x) N.A.

2. TREATMENTS:
   1. Control.
   2. Seed treated with copper carbonate.
   3. Seed treated with Sulphur.
   4. Seed soaked in water and dried in shade.
   5. Seed soaked in water and dried in sunshine.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 5 (b) N.A.  (iii) 5.  (iv) (a), (b) 16' x 66'.  (v) Nil.  (vi) Yes.

4. GENERAL:

5. RESULTS:
   (i) 216.3 lb./ac.
   (ii) 87.36 lb./ac.
   (iii) Treatments do not differ significantly
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>201.9</td>
</tr>
<tr>
<td>2.</td>
<td>222.5</td>
</tr>
<tr>
<td>3.</td>
<td>278.5</td>
</tr>
<tr>
<td>4.</td>
<td>177.0</td>
</tr>
<tr>
<td>5.</td>
<td>201.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>39.0 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Bajra (Kharij).  
Site: Central Res. Farm, Gwalior.  
Ref: M.P. 51(47).  
Type: 'M'.

Object: To study the effect of A/S and Super on the yield of Bajra.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) Gram.  (c) N.A.  (ii) (a) Sandy loam.  (b) Refer soil analysis, Gwalior.  (iii) 3.8.1951.  (iv) 'a' Sabal ploughing.  (b), (c) N.A.  (d) 18".  (e) N.A.  (f) N.A.  (g) N.A.  (h) Nabha.  (i) Unirrigated.  (ii) Interculture by May flower cultivator.  (ix) 25.9'.  (x) 22, 23,10.1951.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of N as A/S: N₀ =0 and N₁ =20 lb./ac.
   (2) 3 levels of P₂O₅ as Super: P₀ =0, P₁ =10 and P₂ =20 lb./ac.

3. DESIGN:
   (i) 2 x 3 Fact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 6.  (iv) (a) 21' x 96'.  (b) 12' x 90'.  (v) 3 rows on both sides and 3' of each row at both ends.  (vi) Yes.

4. GENERAL:
   (i) Good.  (ii) N.A.  (iii) Grain yield.  (iv) (a) 1950—N.A.  (b) N.A.  (c) N.A.  (v) (a) N.A.  (b) N.A.  (vi) and (vii) Nil.
5. RESULTS:

(i) 1341 lb./ac.

(ii) 308.2 lb./ac.

(iii) None of the effects is significant.

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

<table>
<thead>
<tr>
<th></th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>1291</td>
<td>1419</td>
<td>1326</td>
<td>1346</td>
</tr>
<tr>
<td>N₁</td>
<td>1399</td>
<td>1399</td>
<td>1303</td>
<td>1337</td>
</tr>
<tr>
<td>Mean</td>
<td>1345</td>
<td>1364</td>
<td>1315</td>
<td>1341</td>
</tr>
</tbody>
</table>

S.E. of N marginal mean = 72.6 lb./ac.

S.E. of P marginal mean = 89.0 lb./ac.

S.E. of body of table = 125.8 lb./ac.

Crop :-Bajra.

Site :-Central Res. Farm, Gwalior.

Object :-To find out suitable dose of A/Sand Super for Bajra.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 28.7.1952. (iv) (a) to (c) N.A. (d) 18°. (e) N.A. (v) N.A. (vi) N.A. (vii) 1 weeding and 1 interculturing. (ix) 22.60°. (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2)

(1) 5 levels of N as A/S: N₀=0, N₁=10, N₂=20, N₃=30 and N₄=40 lb./ac.

(2) 2 levels of P₂O₅ as Super: P₀=0 and P₁=20 lb./ac.

N applied as top dressing on 30.8.1952 and P₂O₅ drilled before sowing on 28.7.1952.

3. DESIGN:

(i) 2×5 Fact. in R.B.D. (ii) (a) 10, (b) 96’×180’. (iii) 4. (iv) (a) 96’×18°. (b) 90’×12°. (v) 2 rows on both sides and 3’ of each row at both ends. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1952—1953. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted with 6 replications, but 2 replications dropped as the yields were too poor.

5. RESULTS:

(i) 536.7 lb./ac.

(ii) 142.6 lb./ac.

(iii) None of the effects is significant.

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

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>661.0</td>
<td>546.7</td>
<td>543.0</td>
<td>461.3</td>
<td>582.0</td>
<td>558.8</td>
</tr>
<tr>
<td>P₁</td>
<td>528.9</td>
<td>489.9</td>
<td>541.8</td>
<td>418.6</td>
<td>593.6</td>
<td>514.6</td>
</tr>
<tr>
<td>Mean</td>
<td>595.0</td>
<td>518.3</td>
<td>542.4</td>
<td>439.9</td>
<td>587.8</td>
<td>536.7</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 50.4 lb./ac.

S.E. of marginal mean of P = 31.9 lb./ac.

S.E. of body of table = 71.3 lb./ac.
Crop: Bajra (Kharij).

Site: Central Res. Farm, Gwalior.

Object: To find out suitable manurial schedule for Bajra.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Sandy loam.  (b) Refer soil analysis, Gwalior.  (iii) 21.7.1953.  (iv) (a) N.A.  (b) Drilléd.  (c) N.A.  (d) 18'.  (e) N.A.  (v) N.A.  (vi) Baroda 5 (early).  (vii) Unirrigated.  (viii) N.A.  (ix) 23.87'.  (x) 26.9.1953. (maturity date).

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

3. DESIGN:
   (i) Split-plot.  (ii) (a) 5 main-plots/block and 3 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 30'x12'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A.  (iii) Grain yield.  (iv) (a) 1952 to 1953.  (b) No.  (c) N.A.  (v) (a) and (b) N.A.  (vi) Nil.  (vii) Raw data N.A.

5. RESULTS:
   (i) 614 lb./ac.
   (ii) N.A.
   (iii) N.A.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>582</td>
<td>674</td>
<td>705</td>
<td>612</td>
<td>705</td>
<td>656</td>
</tr>
<tr>
<td>P₁</td>
<td>380</td>
<td>404</td>
<td>596</td>
<td>437</td>
<td>467</td>
<td>467</td>
</tr>
<tr>
<td>P₂</td>
<td>674</td>
<td>721</td>
<td>871</td>
<td>576</td>
<td>809</td>
<td>730</td>
</tr>
<tr>
<td>Mean</td>
<td>545</td>
<td>600</td>
<td>724</td>
<td>558</td>
<td>660</td>
<td>614</td>
</tr>
</tbody>
</table>

S.E.'s N.A.

Crop: Kodon (Kharij).

Site: Govt. Seed and Demonstration Farm, Dindori.

Object: To find out the best rotation for Kodon crop.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) N.A.  (iii) N.A.  (iv) (a) to (c) N.A.  (v) to (x) N.A.

2. TREATMENTS:
   1. Kodon; Wheat, Gram.
   2. Kodon; Tur.
   3. Kodon; Lakh.
   4. Kodon; Kodon.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 33'x16'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) to (vi) N.A.  (vii) Tur crop failed completely. The site in heavy rains is susceptible to gally formation resulting in washing away of Kharij crops, which resulted in nearly failure of the crop. Gram and Lakh were badly affected by catter-pillar.
5. RESULTS:

(i) 22 lb./ac.
(ii) 11.3 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of Kodon in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>26</td>
</tr>
<tr>
<td>2.</td>
<td>13</td>
</tr>
<tr>
<td>3.</td>
<td>27</td>
</tr>
<tr>
<td>4.</td>
<td>21</td>
</tr>
</tbody>
</table>

S.E./mean = 4.62 lb./ac.

Crop: Kodon (Kharif).
Ref: M.P. 53(73).
Site: Govt. Seed and Demonstration Farm, Dindori. Type: ‘C’.
Object: To find out the best rotation for Kodon crop on heavy soil.

1. BASAL CONDITIONS:

(i) to (c) N.A. (ii) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS:

1. Kodon; Wheat and Gram.
2. Kodon; Tur.
3. Kodon; Lakh.
4. Kodon; Kodon.

3. DESIGN:

(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 30'X16'4". (v) N.A. (vi) Yes.

4. GENERAL:

(i) to (iii) N.A. (iv) (a) to (c) N.A. (v) and (vi) N.A. (vii) Wheat, Gram and Tur crops failed completely. The experiment consists of both kharif and rabi crops. It goes very difficult in giving preliminary cultivation and sowing of rabi crops. The experiment is always failure.

5. RESULTS:

(i) 46 lb./ac.
(ii) 25.40 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of kodon in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>75</td>
</tr>
<tr>
<td>2.</td>
<td>6</td>
</tr>
<tr>
<td>3.</td>
<td>99</td>
</tr>
<tr>
<td>4.</td>
<td>46</td>
</tr>
</tbody>
</table>

S.E./mean = 10.37 lb./ac.

Crop: Kodon (Kharif).
Ref: M.P. 52(73).
Site: Govt. Seed and Demonstration Farm, Dindori. Type: ‘C’.
Object: To find out the best rotation for Kodon crop on light soil.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) and (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.
2. TREATMENTS:
1. *Kodon, til* and sann.
2. *Kodon* and *urid*.
3. *Kodon* and *Ramtil*.

3. DESIGN:
(i) R.B.D. (ii) (a) N.A. (iii) 6. (iv) (a) N.A. (b) $33' \times 16'$. (v) N.A. (vi) Yes.

4. GENERAL:
(i) (vi) N.A. (vii) Sann and urid crops failed. Remarks by the Supdt. of the Farm:—the experimental results are far below the average yield of crops sown and the only conclusion that can be drawn is that light soils of the tract should not be cultivated year after year and should be left for recouping after three years of cultivation. This is also the practice of the tract and is further confirmed by the complete failure of the experiment in last year which was the best year for kodon crop.

5. RESULTS:
(i) 21 lb./ac.
(ii) 22.49 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>133</td>
</tr>
<tr>
<td>2.</td>
<td>144</td>
</tr>
<tr>
<td>3.</td>
<td>138</td>
</tr>
<tr>
<td>4.</td>
<td>41</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>16.00 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- *Kodon (Kharif).*

Ref :- M.P. 53(87).

Site :- Govt. Seed and Demonstration Farm, Dindori. Type :- 'C'.

Object :- To find out the best rotation for *Kodon* crop on light soil.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) and (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS:
1. *Kodon, til* and sann.
2. *Kodon* and *urid*.
3. *Kodon* and *Ramtil*.
4. *Kodon* and *Kodon*.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) $33' \times 16'$. (v) N.A. (vi) Yes.

4. GENERAL:
(i) to (vi) N.A. (vii) Urid and sann plants dried out. Best economical rotation seems to be *Kodon* after *Ramtil*, as it pays in both the crops.

5. RESULTS:
(i) 116 lb./ac.
(ii) 39.19 lb./ac.
(iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>133</td>
</tr>
<tr>
<td>2.</td>
<td>144</td>
</tr>
<tr>
<td>3.</td>
<td>138</td>
</tr>
<tr>
<td>4.</td>
<td>41</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>16.00 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Kutki (Kharif).
Site :- Govt. Seed and Demonstration Farm, Dindori.
Object :- To find out the best rotation for Kutki crop.

Ref :- M.P. 52(74).
Type :- 'C'.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) and (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS:
   1. Kutki, Til and sann.
   2. Kutki and Urid.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 33'×16\frac{1}{2}'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) to (vi) N.A. (vii) Sann and urid crops failed. Remarks by the Farm Supdt:-the growth of Kutki crop is taken for analysis, as other crops failed.

5. RESULTS:
   (i) 78 lb./ac.
   (ii) 14.97 lb./ac.
   (iii) Treatment differences are significant.
   (iv) Av. yield of kutki in lb./ac.
      Treatment  | Av. yield
      1.         | 93
      2.         | 74
      3.         | 84
      4.         | 62
   S.E./mean  = 6.11 lb./ac.

Crop :- Kutki (Kharif).
Site :- Govt. Seed and Demonstration Farm, Dindori. Type :- 'C'.

Object :- To find out best rotation for Kutki crop on light soil.

Ref :- M.P. 53(88).

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) and (iii) N.A. (iv) (a) to (e) N.A. (v) to (x) N.A.

2. TREATMENTS:
   1. Kutki, sann and til.
   2. Kutki, and urid.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 34'×16\frac{1}{2}'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) to (vi) N.A. (vii) Sann and urid crops failed. Remarks by the Farm Supdt:-the growth of Kutki upto September was good. But due to cloudy weather, the attack by blister bettle was very severe and this affected the yield very badly. Lack of rains and moisture caused complete failure in pod formation of urid and sann plots.

5. RESULTS:
   (i) 77 lb./ac.
   (ii) 24.64 lb./ac.
   (iii) Treatment differences are significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>118</td>
</tr>
<tr>
<td>2.</td>
<td>55</td>
</tr>
<tr>
<td>3.</td>
<td>78</td>
</tr>
<tr>
<td>4.</td>
<td>58</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 15.06 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Potato (Rabi).

Site: Govt. Exptl. Farm, Chhindwara.

Object: To find out optimum manurial dose for Potato under local conditions.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 2.12.1943.

(iv) (a) Plots prepared on 22.11.1948. Ridges and furrows were prepared on 1.12.1948. (b) N.A. (c) 10 md./ac. (d) N.A. (e) N.A. (f) P.Y.M. at 120 lb./ac. of N applied in furrows on 2.12.1948. (v) Patna Red (medium). (vi) Irrigated. (vii) Weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:

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

(1) 3 levels of N as A/S: N₀ = 0, N₁ = 100 and N₂ = 200 lb./ac.

(2) 3 levels of P₂O₅ as triple Super: P₀ = 0, P₁ = 250 and P₂ = 500 lb./ac.

(3) 3 levels of K₂O as muriate of Potash: K₀ = 0, K₁ = 125 and K₂ = 250 lb./ac.

3. DESIGN:

(i) 3³ Conf. (ii) (a) 3 blocks/replication, 9 plots/block (b) N.A. (iii) 1. (iv) (a) and (b) 18.15’x6’. (v) Nil. (vi) Yei.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Grain yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) N.A.

5. RESULTS:

(i) 14592 lb./ac.

(ii) 1204 lb./ac.

(iii) Main effects of N and P alone are significant.

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

<table>
<thead>
<tr>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
<th>K₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₀</td>
<td>11466</td>
<td>12400</td>
<td>13466</td>
<td>12444</td>
<td>12133</td>
<td>12000</td>
</tr>
<tr>
<td>N₁</td>
<td>12800</td>
<td>16666</td>
<td>15600</td>
<td>15022</td>
<td>15333</td>
<td>14800</td>
</tr>
<tr>
<td>N₂</td>
<td>13600</td>
<td>17733</td>
<td>17600</td>
<td>16311</td>
<td>16266</td>
<td>16400</td>
</tr>
<tr>
<td>Mean</td>
<td>12622</td>
<td>15600</td>
<td>15555</td>
<td>14592</td>
<td>14577</td>
<td>14420</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 401 lb./ac.

S.E. of body of table = 695 lb./ac.
Crop: Potato (Rabi).
Site: Govt. Exptl. Farm, Chindwara.

Object: To find out suitable combination of N and P₂O₅ for Potato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 20.11.1949. (iv) (a) to (e) N.A. (v) F.Y.M. at 120 lb./ac. of N applied in furrows on 21.11.1949. (vi) Patna Red (medium). (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N₀ = 0, N₁ = 100 and N₂ = 200 lb./ac.
   (2) 3 levels of P₂O₅ as triple Super: P₀ = 0, P₁ = 250 and P₂ = 500 lb./ac.

3. DESIGN:
   (i) 3 x 3 Fac. in R.B.D. (ii) (a) 9. (b) 235.8' x 4.5'. (iii) 3. (iv) (a) and (b) 24.2' x 4.5'. (v) 2 feet margin between plots and blocks. (vi) Yes.

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

5. RESULTS:
   (i) 4129 lb./ac.
   (ii) 1024 lb./ac.
   (iii) Main effects of N and P and their interaction are highly significant.
   (iv) Av. yield of potato in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>2165</td>
<td>3699</td>
<td>3465</td>
<td>3110</td>
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<td>4667</td>
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<td>4511</td>
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<td>P₂</td>
<td>6133</td>
<td>2416</td>
<td>5748</td>
<td>4765</td>
</tr>
<tr>
<td>Mean</td>
<td>3677</td>
<td>3594</td>
<td>5115</td>
<td>4129</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 341 lb./ac.
S.E. of body of table = 591 lb./ac.

Crop: Potato (Rabi).
Site: Govt. Exptl. Farm, Chindwara.

Object: To find out suitable manure for Potato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) N.A. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Darjeeling Red.

2. TREATMENTS:
   1. A/S at 100 lb./ac. of N on 31.12.1951.
   2. Compost at 30 lb./ac. + Oil cake at 20 md./ac. + mixture of A/S at 10 lb./plot and Ammo. Phos. at 10 lb./plot and saw dust at 40 lb./plot.
   3. Half the dose in treatment 2.
   4. Double the dose in treatment 2.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 5. (iv) 1/40 ac. (v) Nil, (vi) Yes.

4. GENERAL:
   (i) Germination was poor. Growth was good. (ii) N.A. (iii) Potato yield. (iv) (a) 1951 to N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. **RESULTS**:

(i) 4048 lb./ac.
(ii) 1034 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>3703</td>
</tr>
<tr>
<td>2.</td>
<td>3664</td>
</tr>
<tr>
<td>3.</td>
<td>3670</td>
</tr>
<tr>
<td>4.</td>
<td>5217</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>462 lb./ac.</td>
</tr>
</tbody>
</table>

---

**Crop** - **Potato** *(Rabi)*.

**Site** - **Govt. Exptl. Farm, Chindwara**.

**Type** - 'M'.

**Object** - To find out the effect of compost when applied at different times singly and in combination with G.N.C. and A/S.

1. **BASAL CONDITIONS**:

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 15.10.1948. (iv) (a) to (e) N.A. (v) N.A. (vi) Patna Red (medium). (vii) Irrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. **TREATMENTS**:

1. No manure.
2. T. C. at 30 C.L./ac. applied before monsoon.
3. T. C. at 30 C.L./ac. applied in furrows at sowing.
4. T. C. at 30 C.L./ac. applied half before monsoon and the remaining half at transplanting.
5. T. C. at 15 C.L./ac. before monsoon + 5 md./ac. of G.N.C. at planting.
6. T. C. at 15 C.L./ac. before monsoon + 120 lb./ac. of A/S at planting.
7. T. C. at 15 C.L./ac. before monsoon + 10 md./ac. of G.N.C. at planting.
8. T. C. at 15 C.L./ac. before monsoon + 240 lb./ac. of A/S at planting in furrows.
9. T. C. at 30 C.L./ac. together with 5 md. of cake at planting in furrows.
10. T. C. at 30 C.L./ac. together with 10 md./ac. at planting in furrows.

3. **DESIGN**:

(i) R.B.D. (ii) (a) 10. (b) 187' × 33', (iii) 6. (iv) (a) and (b) 16½' × 33'. (v) 3' margin between plots was left. (vi) N.A.

4. **GENERAL**:

(i) Germination satisfactory in all plots. In general good growth. (ii) N.A. (iii) Potato yield. (iv) (a) to (c) N.A. (v) N.A. (vi) and (vii) Nil.

5. **RESULTS**:

(i) 10659 lb./ac.
(ii) 984.1 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>8763</td>
<td>6.</td>
<td>11821</td>
</tr>
<tr>
<td>2.</td>
<td>10189</td>
<td>7.</td>
<td>10971</td>
</tr>
<tr>
<td>3.</td>
<td>9819</td>
<td>8.</td>
<td>12987</td>
</tr>
<tr>
<td>4.</td>
<td>9174</td>
<td>9.</td>
<td>10779</td>
</tr>
<tr>
<td>5.</td>
<td>10409</td>
<td>10.</td>
<td>11884</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>401.8 lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Crop: Potato (Rabi).
Site: Govt. Exptl. Farm, Chindwara.

Object: To find out suitable doses of T.C. so as to get maximum yield of Potato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) to (x) N.A.

2. TREATMENTS:
   1. Control (unmanured).
   3. Manuring with T.C. at 30 C.L./ac. at planting in furrows.
   4. T.C. at 30 C.L./ac. half before monsoon and remaining half at planting.
   5. T.C. at 15 C.L./ac. before monsoon and 5 md./ac. of cake at planting.
   6. T.C. at 15 C.L./ac. before monsoon and 15 C.L. at planting in furrows and 120 lb of A/S at planting.
   7. T.C. as in treatment 6 and 10 md./ac. of cake in furrows at planting.
   8. T.C. at 30 C.L./ac. as in treatment 6 and 240 lb. of A/S at planting in furrows.
   9. T.C. at 30 C.L./ac. together with 5 md./ac. of cake at planting.
   10. T.C. at 30 C.L./ac. together with 10 md./ac. of cake at planting in furrows.

3. DESIGN:
   (i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) and (b) 1/80 ac. (v) Nil. (vi) Yes.

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

5. RESULTS:
   (i) 5915 lb/ac.
   (ii) 1328 lb/ac.
   (iii) Treatment differences are not significant.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>6035</td>
<td>6144</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>5801</td>
<td>5952</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>5788</td>
<td>7406</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>5541</td>
<td>5513</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>5404</td>
<td>5568</td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 542 lb/ac.

Crop: Potato (Kharif).
Site: Govt. Exptl. Farm, Chindwara.

Object: To find out the suitable manurial dose for Potato.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 22.6.1948. (iv) (a) Ridges and furrows prepared on 21.6.1948. (b) N.A. (c) 10 md./ac. (d) Between plants 8" to 9" and between rows 12". (e) N.A. (v) F.Y.M. at 120 lb./ac. of N as applied on 22.6.1948 before planting. (vi) Nainital. (vii) N.A. (viii) 1 weeding. (ix) and (x) N.A.

2. TREATMENTS:
   1. Control.
   2. A/S at 100 lb./ac. of N in two equal doses, first dose one month after planting and second 3 weeks after first dose.
   3. 100 lb./ac. of N as Ammo. Phos. in two equal doses as in treatment 2.
   4. 100 lb./ac. of N as G.N.C in two equal doses as in treatment 2.

First dose on 2.8.1948 and second dose on 18.8.1948.
Crop: Potato (Rabi).
Site: Govt. Exptl. Farm, Chhindwara.
Object: To find out suitable manure for Potato.

1. BASAL CONDITIONS:
   (i) (a), to (c) N.A. (ii) (a) and (b) N.A. (iii) 16.11.1949. (iv) (a) and (b) N.A. (c) 1 see/plot. (d) and (e) N.A. (v) F.V. M at 22½ lb. plot applied in furrows. (vi) Furanocab. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   1. Control.
   2. A/S at 100 lb./ac. of N.
   3. Ammo. Phos. at 100 lb/acre. of N.
   4. G.N.C. at 100 lb/acre. of N.

   Applied in two equal doses first dose one month after planting and second 3 weeks after first dose.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 18' x 5'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Germination satisfactory. (ii) N.A. (iii) Potato yield. (iv) (a) 1948 to N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 7680 lb/ac.
   (ii) 4232 lb/ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of potato in lb/ac.

   Treatment       Av. yield
   1.                  5211
   2.                  7336
   3.                  10902
   4.                  7268

   S.E./mean = 1728 lb/ac.
Crop :- Potato. Ref :- M.P. 50(60).
Site :- Govt. Exptl. Farm, Chindwara.
Type :- 'M'.

Object :- To find out suitable manure for Potato.

1. BASAL CONDITIONS :
(i) (a) to (c) N.A. (ii) (a), (b) N.A. (iii) 30.10.1950. (iv) (a) to (e) N.A. (v) F.Y.M. added in furrows at 120 lb./ac. of N. (vi) Patna Red. (vii) Irrigated. (viii) N.A. (ix) N.A. (x) 28.3.1951.

2. TREATMENTS :
1. Control.
2. A/S at 100 lb./ac. of N.
3. Ammo. Phos. at 100 lb./ac. of N.
4. G.N.C. at 100 lb./ac. of N.
   Applied in two equal doses.

3. DESIGN :
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) and (b) 18.15’x6’. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Germination satisfactory. (ii) N.A. (iii) Potato yield. (iv) (a) to (c) N.A. (v) (a), (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 23295 lb./ac.
(ii) 2584 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>21719</td>
</tr>
<tr>
<td>2.</td>
<td>22678</td>
</tr>
<tr>
<td>3.</td>
<td>25488</td>
</tr>
<tr>
<td>4.</td>
<td>23295</td>
</tr>
</tbody>
</table>

S.E./mean = 1055 lb./ac.

Crop :- Potato (Rabi). Ref :- M.P. 49(55).
Site :- Govt. Exptl. Farm, Chindwara.
Type :- 'M'.

Object :- To find out suitable manure for Potato.

1. BASAL CONDITIONS :
(i) to (a) (c) N.A. (ii) (a) and (b) N.A. (iii) 16.11.1949. (iv) (a) to (c) N.A. (v) F.Y.M. at 224 lb./plot applied in furrows. (vi) Patna Red (medium). (vii) to (x) N.A.

2. TREATMENTS :
1. No manure.
3. A/S at 100 lb./ac. of N.
4. Ammo. Phos. at 100 lb./ac. of N.
5. G.N.C. at 100 lb./ac. of N.
   Applied in 2 equal doses 1st dose one month after planting and 2nd dose 3 weeks after 1st dose.

3. DESIGN :
(i) R.B.D. (ii) (a) 5. (b) 112’x5’7”, (iii) 6. (iv) (a) and (b) 18’x5’7”. (v) Spacing between plots 2’. (vi) Yes.

4. GENERAL :
(i) and (ii) N.A. (iii) Potato yield. (iv) (a) 1949—N.A. (b) N.A. (c) Nil. (v) (a) and (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 2041 lb./ac.
(ii) 396.8 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1429</td>
</tr>
<tr>
<td>2.</td>
<td>1315</td>
</tr>
<tr>
<td>3.</td>
<td>2437</td>
</tr>
<tr>
<td>4.</td>
<td>3144</td>
</tr>
<tr>
<td>5.</td>
<td>1880</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 162.0 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Potato (Rabi).
Site :- Govt. Exptl. Farm, Chhindwara.

Object :- To find out a suitable manure for Potato.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A.
(ii) (a) and (b) N.A.
(iii) 30.10.1950.
(iv) (a) to (e) N.A.
(v) F.Y.M. at 120 lb./ac. of N applied as basal manure.
(vi) Farukhabad. (vii) irrigated. (viii) and (ix) N.A. ; x: 17.3.1951.

2. TREATMENTS:

1. Control.
2. A/S at 100 lb./ac. of N.
3. Ammon. Phos. at 100 lb./ac. of N.
4. G.N.C. at 100 lb./ac. of N.

Applied in two equal doses 1st dose at planting and 2nd dose 3 weeks after planting.

3. DESIGN:

(i) R.B.D.
(ii) (a) 4. (b) N.A.
(iii) 6.
(iv) (a) and (b) 1/400 ac. (v) Nil. (vi) Yes.

4. GENERAL:

(i) Germination satisfactory in all plots.
(ii) N.A.
(iii) Potato yield.
(iv) (a) to (c) N.A.
(v) (a) and (b) N.A. ; (vi) and (vii) Nil.

5. RESULTS:

(i) 2041 lb./ac.
(ii) 396.8 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>21409</td>
</tr>
<tr>
<td>2.</td>
<td>25422</td>
</tr>
<tr>
<td>3.</td>
<td>70666</td>
</tr>
<tr>
<td>4.</td>
<td>25643</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 985 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Potato.
Site :- Institute of Plant Industry, Indore.

Object :- To study the effect of different doses of N, P, and K applied singly and in combination on the yield of Potato.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A.
(ii) (a) Black cotton soil. (b) N.A.
(iii) N.A.
(iv) (a) Bakhering. (b) to (c) N.A.
(v) 3 blocks received farm compost and for the remaining 3 blocks night soil was given. (vi) Tamar. (vii) N.A. (viii) Weeding. (ix) N.A. (x) N.A.
2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 2 levels of N as A/S: N₀ = 0 and N₁ = 40 lb./ac.
(2) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 40 lb./ac.
(3) 2 levels of K₂O as Pot. Sol.: K₀ = 0 and K₁ = 80 lb./ac.

3. DESIGN:
(i) 2² Fact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 6.  (iv) (a) N.A.  (b) 6’ × 50’.  (v) N.A.  (vi) Yes.

4. GENERAL:
(i) Germination slightly defective; growth good.  (ii) Crop damaged considerably due to frost in February.
(iii) Potato yield.  (iv) (a) to (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>Mean</th>
<th>K₀</th>
<th>K₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>6577</td>
<td>7689</td>
<td>7283</td>
<td>7854</td>
<td>6712</td>
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<tr>
<td>P₁</td>
<td>7016</td>
<td>8237</td>
<td>7626</td>
<td>7639</td>
<td>7594</td>
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<tr>
<td>Mean</td>
<td>6946</td>
<td>7963</td>
<td>7454</td>
<td>7756</td>
<td>71.3</td>
</tr>
<tr>
<td>K₀</td>
<td>7110</td>
<td>8403</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K₁</td>
<td>6782</td>
<td>7523</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 278 lb./ac.
S.E. of body of any table = 393 lb./ac.

Crop :- Potato (Rabī).
Site :- Institute of Plant Industry, Indore.
Ref :- M.P. 51(9).
Type :- ‘M’.

Object :- To find out optimum manurial dose for Potato under local conditions.

1. BASAL CONDITIONS:
(i) (a) N.A.  (b) Fallow with Sān G.M. for first block.  (c) Nil.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 2 levels of N as A/S: N₀ = 0 and N₁ = 40 lb./ac.
(2) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 40 lb./ac.
(3) 2 levels of K₂O as Mono. Potash: K₀ = 0 and K₁ = 80 lb./ac.

Manures applied on 3.12.1951.

3. DESIGN:
(i) 2² Fact. in R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 4.  (iv) (a) 40’ × 7’6”.  (b) 40’ × 4’6”.  (v) One row on both sides.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Number of potatoes and weight of potatoes.  (iv) (a) 1947—N.A.  (b) N.A.  (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.
5. RESULTS:
(i) 12577 lb./ac.
(ii) 1449 lb./ac.
(iii) Main effect of P alone is significant.
(iv) Av. yield of potato in lb./ac.

\[
\begin{array}{c|cc|c|cc}
 & N_0 & N_1 & \text{Mean} & K_0 & K_1 \\
\hline
P_0 & 11440 & 12463 & 11951 & 11880 & 12322 \\
P_1 & 13003 & 13402 & 13203 & 12637 & 13774 \\
\text{Mean} & 12222 & 12922 & 12377 & 12256 & 12898 \\
K_0 & 11988 & 12523 & & & \\
K_1 & 12455 & 13342 & & & \\
\hline
\end{array}
\]

S.E. of any marginal mean = 362 lb./ac.
S.E. of body of any table = 512 lb./ac.

Crop : Potato (Kharif).

Sire : Govt. Exptl. Farm, Chindwara.

Ref : M.P. 48(42).

Type : 'C'.

Object : To find out optimum spacing for Potato planting.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) N.A. (b) N.A. (iii) 26.6.1948. (iv) (a) to (c) N.A. (d) As per treatments.
(e) N.A. (v) F.Y.M. at 120 lb./ac of N applied at planting in furrows. A/S applied as top dressing at 1/4 lb. per plot on 18.8.1948. (vi) N.A. (vii) N.A. (viii) One earthing. (ix) N.A. (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 spacings between tubers : S_1 = 6", S_2 = 9" and S_3 = 12".
(2) 4 spacings between rows : R_1 = 12", R_2 = 18", R_3 = 24" and R_4 = 30".

3. DESIGN:
(i) 3x4 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 6. (iv) (a) and (b) 24.2'x4.5'. (v) N.I. (vi) yes.

4. GENERAL:
(i) Tubers germinated on 13.7.1948, growth ordinary. (ii) N.A. (iii) No. of plants as on 18.8.1948 and potato yield (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 4167 lb./ac.
(ii) 2279 lb./ac.
(iii) Main effect of R and interaction RxS are highly significant. Main effect of S is not significant.
(iv) Av. yield of potato in lb./ac.

\[
\begin{array}{c|ccc|c}
 & S_1 & S_2 & S_3 & \text{Mean} \\
\hline
R_1 & 18401 & 17134 & 18401 & 17299 \\
R_2 & 15267 & 14867 & 14934 & 15023 \\
R_3 & 13801 & 12067 & 10867 & 12245 \\
R_4 & 12401 & 11201 & 10667 & 11423 \\
\text{Mean} & 14967 & 13825 & 13717 & 14167 \\
\hline
\end{array}
\]

S.E. of marginal mean of S = 465 lb./ac.
S.E. of marginal mean of R = 537 lb./ac.
S.E. of body of table = 930 lb./ac.
Crop: Potato (Rabi).
Site: Govt. Exptl. Farm, Chindwara.

Object: To find out proper spacing for Potato.

1. BASAL CONDITIONS:
- (i) (a) to (c) N.A.
- (ii) (a) N.A.
- (iii) 18.11.1949.
- (iv) (a) to (c) N.A.
- (d) As per treatments.
- (e) N.A.
- (v) F.Y.M. at 120 lb./ac. of N given in furrows on 18.11. 1949. (vi) to (x) N.A.

2. TREATMENTS:
- All combinations of (1) and (2)
  (1) 3 spacings between tubers: \( S_1 = 6' \), \( S_2 = 9' \) and \( S_3 = 12' \).
  (2) 4 spacings between rows: \( R_1 = 12' \), \( R_2 = 15' \), \( R_3 = 24' \) and \( R_4 = 30' \).

3. DESIGN:
- (i) 3 x 4 Fact. in R.B.D.
- (ii) (a) 12. (b) 98' x 18'.
- (iii) 6.
- (iv) (a), (b) 18.15' x 6'.
- (v) Nil.
- (vi) Yes.

4. GENERAL:
- (i) N.A.
- (ii) N.A.
- (iii) Potato yield.
- (iv) (a) to (c) N.A.
- (v) (a) N.A.
- (vi) and (vii) Nil.

5. RESULTS:
- (i) 5149 lb./ac.
- (ii) 1002 lb./ac.
- (iii) Main effect of R is highly significant.
- (iv) Av. yield of potato in lb./ac.

<table>
<thead>
<tr>
<th>( S_1 )</th>
<th>( R_1 )</th>
<th>( R_2 )</th>
<th>( R_3 )</th>
<th>( R_4 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>6066</td>
<td>6182</td>
<td>5149</td>
<td>4800</td>
<td>5549</td>
<td></td>
</tr>
<tr>
<td>5600</td>
<td>5300</td>
<td>4800</td>
<td>4334</td>
<td>5009</td>
<td></td>
</tr>
<tr>
<td>5392</td>
<td>5600</td>
<td>4634</td>
<td>3934</td>
<td>4890</td>
<td></td>
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<tr>
<td>Mean</td>
<td>5686</td>
<td>5694</td>
<td>4861</td>
<td>4356</td>
<td>5149</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of \( S = 204 \) lb./ac.
S.E. of marginal mean of \( R = 236 \) lb./ac.
S.E. of body of table = 409 lb./ac.

Crop: Potato (Rabi).
Site: Govt. Exptl. Farm, Chindwara.

Object: To find out suitable spacing between lines and tubers for Potato.

1. BASAL CONDITIONS:
- (i) (a) to (c) N.A.
- (ii) (a) and (b) N.A.
- (iii) 29.10.1950.
- (iv) (a) to (c) N.A.
- (d) As per treatments.
- (e) One tuber/hole.
- (f) N.A.
- (v) Patna Red.
- (vi) Irrigated.
- (vii) N.A.
- (ix) N.A.
- (x) 24.3.1951 to 27.3.1951.

2. TREATMENTS:
- All combinations of (1) and (2)
  (1) 3 spacings between tubers: \( S_1 = 6' \), \( S_2 = 9' \) and \( S_3 = 12' \).
  (2) 4 spacings between rows: \( R_1 = 12' \), \( R_2 = 15' \), \( R_3 = 24' \) and \( R_4 = 30' \).

3. DESIGN:
- (i) 3 x 4 Fact. in R.B.D.
- (ii) (a) 12. (b) N.A.
- (iii) 6.
- (iv) (a) and (b) 1/400 ac.
- (v) No.
- (vi) Yes.

4. GENERAL:
- (i) N.A.
- (ii) N.A.
- (iii) Potato yield.
- (iv) (a) to (c) N.A.
- (v) (a) and (b) N.A.
- (vi) and (vii) Nil.
5. RESULTS:
(i) 19604 lb./ac.
(ii) 3708 lb./ac.
(iii) Main effect of R alone is highly significant.
(iv) Av. yield of potato in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_1$</td>
<td>19815</td>
<td>21872</td>
<td>19130</td>
<td>20272</td>
</tr>
<tr>
<td>$R_2$</td>
<td>24272</td>
<td>21461</td>
<td>21292</td>
<td>22421</td>
</tr>
<tr>
<td>$R_3$</td>
<td>21941</td>
<td>18718</td>
<td>20707</td>
<td>20455</td>
</tr>
<tr>
<td>$R_4$</td>
<td>15427</td>
<td>14536</td>
<td>15339</td>
<td>15267</td>
</tr>
</tbody>
</table>

Mean  | 20364  | 19447  | 19841  | 19604 |

S. E. of marginal mean of $S$  = 757 lb./ac.
S. E. of marginal mean of $R$  = 874 lb./ac.
S. E. of body of table  = 1514 lb./ac.

Crop :- Potato (Rabi).
Site :- Govt. Exptl. Farm, Chindwara.
Ref :- M.P. 49(53).
Type :- "C".

Object :- To find out optimum size of tubers for planting so as to get maximum yield.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) and (b) N.A.  (iii) 27.11.1949.  (iv) (a) to (c) N.A.  (v) F.Y.M. at 120 lb./ac. applied in furrows before planting. Top dressing with A/S at 100 lb./ac. of N. (vi) Patna Red. (vii) to (x) N.A.

2. TREATMENTS:
5 sizes of whole tubers for planting :
   $S_1=\frac{1}{2}$, $S_2=\frac{1}{2}$, $S_3=1'$, $S_4=1\frac{1}{2}'$ and $S_5=2'$.  

3. DESIGN:
   (i) R.B.D.  (ii) (a) 5.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 18.15′ x 6′.  (v) 2′ margin between plots and blocks.  (vi) Yes.

4. GENERAL:
   (i) Germination satisfactory but poor growth of plants under treatment 3.  (ii) N.A.  (iii) Potato yield.
   (iv) (a) No.  (b) N.A.  (c) Nil.  (v) (a) Nil.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 2545 lb./ac.
(ii) 1023 lb./ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of potato in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>$S_1$</td>
<td>2261</td>
</tr>
<tr>
<td>$S_2$</td>
<td>2228</td>
</tr>
<tr>
<td>$S_3$</td>
<td>547</td>
</tr>
<tr>
<td>$S_4$</td>
<td>4026</td>
</tr>
<tr>
<td>$S_5$</td>
<td>3664</td>
</tr>
</tbody>
</table>

S.E. /mean.  = 417 lb./ac.
Crop :- Potato (*Rahi*).

Ref :- M.P. 49(54).

Site :- Govt. Exptl. Farm, Chindwara.

Type :- 'C'.

Object :- To find the optimum size of cut tubers for planting Potato so as to get maximum yield.

1. **BASAL CONDITIONS** :
   (i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 28.11.1949. (iv) (a) to (e) N.A. (v) F.Y.M. at 120 lb./ac. of N applied in furrows before planting. Top dressing with A/S at 100 lb./ac. of N. (vi) Peas red. (vii) to (x) N.A.

2. **TREATMENTS** :
   5 sizes of cut tubers for planting : $S_1 = 1^{\frac{1}{2}}$, $S_2 = 2^{\frac{1}{2}}$, $S_3 = 1^{\frac{1}{4}}$, and $S_4 = 1^{\frac{3}{4}}$.

3. **DESIGN** :
   (i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 181.5'x6'. (v) 2' margin between plants and between blocks. (vi) Yes.

4. **GENERAL** :
   (i) Germination satisfactory in plots under treatments 4 and 5 and extremely poor in plots under treatment 3. (ii) N.A. (iii) Weight of tubers. (iv) (a) and (b) N.A. (c) Nil. (v) (a) Nil. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS** :
   (i) 9913 lb./ac.
   (ii) 2030 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of potato in lb./ac.
   \[
   \begin{array}{|c|c|}
   \hline
   \text{Treatment} & \text{Av. yield} \\
   \hline
   S_1 & 9873 \\
   S_2 & 8312 \\
   S_3 & 6223 \\
   S_4 & 15940 \\
   S_5 & 12218 \\
   \text{S.E./mean} & 8291 \text{ b./ac.} \\
   \hline
   \end{array}
   \]

---

Crop :- Tur.

Ref :- M.P. 48(7).

Site :- Institute of Plant Industry, Indore.

Type :- 'M'.

Object := To study the effect of N applied singly and in combination with P$_2$O$_5$ on the yield of Tur.

1. **BASAL CONDITIONS** :
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (d) 14'. (e) N.A. (v) to (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. **TREATMENTS** :
   All combinations of (1) and (2).
   (1) 3 levels of N as G.N.C. : $N_0 = 0$, $N_1 = 20$ and $N_2 = 40$ lb./ac.
   (2) 3 levels of P$_2$O$_5$ as B.M. : $P_0 = 0$, $P_1 = 20$ and $P_2 = 40$ lb./ac.

3. **DESIGN** :
   (i) 3x3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 15'x35'. (b) 10'x30'4'. (v) Two rows on both sides and 25' of each row at both ends. (vi) Yes.

4. **GENERAL** :
   (i) and (ii) N.A. (iii) Grain and fodder yield. (iv) (a) to (c) N.A. (v) 'a' and (b) N.A. (vi) Nil. (vii) The experiment is laid out in 6 replications. But the crop failed in two replications.

5. **RESULTS** :
   (i) 391 lb./ac.
   (ii) 88.27 lb./ac.
   (iii) Main effect of N alone is significant.
Crop: Tur (Kharif).
Site: Institute of Plant Industry, Indore.

Object: To study the effect of N and P applied singly and in combination on the yield of Tur.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) 3.7.1949.  (iv) (a) Bakharing.  (b) and (c) N.A.  (d) 14'.  (e) N.A.  (v) N.A.  (vi) Tur type 5.  (vii) N.A.  (viii) Weeding.  (ix) and (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N as A/S: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
(2) 3 levels of P₂O₅ as Super: P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.

3. DESIGN:
(i) 3 x 3 Fact. in R.B.D.  (ii) 9.  (b) N.A.  (iii) 6.  (iv) (a) 14' x 35'.  (b) 10' x 30' 4'.  (v) 1' x 1  
(vi) Yes.

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

5. RESULTS:
(i) 871 lb./ac.
(ii) 148.7 lb./ac.
(iii) Main effect of P alone is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>326</td>
<td>422</td>
<td>449</td>
</tr>
<tr>
<td>P₁</td>
<td>332</td>
<td>363</td>
<td>422</td>
</tr>
<tr>
<td>P₂</td>
<td>339</td>
<td>445</td>
<td>413</td>
</tr>
<tr>
<td>Mean</td>
<td>332</td>
<td>412</td>
<td>428</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 25.50 lb./ac.
S.E. of body of table = 64.13 lb./ac.
Crop : Tur.  
Site : Institute of Plant Industry, Indore.

Object : To find out the effect of application of N, P and compost on the yield of Tur.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) Wheat.  (c) Nil.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) 1.6.1951.  (iv) Bakhari...
   (b) and (c) N.A.  (d) 14".  (e) N.A.  (v) N.A.  (vi) Type 5.  (vii) N.A.  (viii) Weeding and thinning.  (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 2 levels of farm compost: \( F_0 = \text{no compost and } F_1 = \text{compost (dose N.A.}) \)
   (2) 2 levels of N as A/S: \( N_0 = 0 \) and \( N_1 = 20 \) lb./ac.
   (3) 2 levels of \( P_2O_5 \) as Super: \( P_0 = 0 \) and \( P_1 = 20 \) lb./ac.

3. DESIGN:
   (i) 2^5 Fact. in R.B.D.  (ii) (a) 8. (b) N.A.  (iii) 6.  (iv) (a) 28'x14'. (b) 25'4"x10'. (v) 1'2"x1'. (vi) Yes.

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

5. RESULTS:
   (i) 102.7 lb./ac.
   (ii) 77.8 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( F_0 )</th>
<th>( F_1 )</th>
<th>Mean</th>
<th>( P_0 )</th>
<th>( P_1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_0 )</td>
<td>110.8</td>
<td>116.6</td>
<td>113.7</td>
<td>130.2</td>
<td>97.2</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>104.0</td>
<td>79.7</td>
<td>91.8</td>
<td>104.0</td>
<td>79.7</td>
</tr>
<tr>
<td>Mean</td>
<td>107.4</td>
<td>98.1</td>
<td>102.7</td>
<td>117.1</td>
<td>88.4</td>
</tr>
<tr>
<td>( P_0 )</td>
<td>117.6</td>
<td>116.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( P_1 )</td>
<td>97.2</td>
<td>79.7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean
=15.3 lb./ac.
S.E. of body of any table
=22.5 lb./ac.

Crop : Moong.  
Site : Institute of Plant Industry, Indore.  
Ref M.P. : - 53(100).  
Type : 'C'.

Object : To find out the residual effect of trace elements on growth and yield of Moong.

1. BASAL CONDITIONS:
   (i) (a) Nil.  (b) Cotton.  (c) Nil.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) N.A.  (iv) (a) to (e) N.A.
   (v) N.A.  (vi) N.A.  (vii) Unirrigated.  (viii) to (x) N.A.

2. TREATMENTS:

<table>
<thead>
<tr>
<th>Trace element</th>
<th>Quantity applied in 1947 in lb./ac.</th>
<th>Quantity applied in 1948 in lb./ac.</th>
<th>Quantity applied in 1949 in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Control (no element)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2. Molybdenum</td>
<td>14</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>
3. Boron 20 10 10
4. Copper 24 12 12
5. Magnesium 40 20 20
6. Iron 30 15 15
7. Manganese 20 10 10
8. Zinc 20 10 10
9. Chromium 2 2 2

Method of application: The salts after powdering and mixing with earth, were spread uniformly in the respective plots and thoroughly mixed with the soil by means of hand duma.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 3'×3'. (b) 6'×3'. (v) N.A. (vi) N.A.

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

5. RESULTS:
   (i) 173 lb./ac.
   (ii) 31.53 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>107</td>
<td>6.</td>
<td>107</td>
</tr>
<tr>
<td>7.</td>
<td>110</td>
<td>8.</td>
<td>180</td>
</tr>
<tr>
<td>8.</td>
<td>177</td>
<td>9.</td>
<td>177</td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td>S.E./mean</td>
<td>12.37 lb./ac.</td>
</tr>
</tbody>
</table>

---

Crop: Masoor.
Site: Adhartal Farm, Jabalpore.
Ref: M.P. 50(24).
Type: 'M'.
Object: To study the effect of different doses of N given in the form of Amm. Phos and A/S on masoor crop in Hasvei tract.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Kabar. (b) Refer soil analysis, jabalpore. (iii) 4 10.1950. (iv) (a) Bascharing. (b) to (e) N.A. (v) N.A. (vi) Masoor. (vii) N.A. (viii) Weeding on 22.11.1950. (ix) N.A. (x) 28.1.1951.

2. TREATMENTS:
   All combinations (1) and (2) + a control.
   (1) 2 sources of N: N1 = Amm. Phos. and N2 = A/S.
   (2) 4 levels of N: L1 = 5, L2 = 10, L3 = 15 and L4 = 20 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 3'×16'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1943.—N.A. (b) N.A. (c) N.A. (v) N.A. (vi) N.A. (vii) Nil. (viii) Yes.

5. RESULTS:
   (i) 1211 lb./ac.
   (ii) 142.4 lb./ac.
   (iii) L and 'control vs. others' effects are highly significant.
(iv) Av. yield of grain in lb./ac.

Control =1000 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₁</th>
<th>L₂</th>
<th>L₃</th>
<th>L₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
<td>1160</td>
<td>1163</td>
<td>1256</td>
<td>1373</td>
<td>1238</td>
</tr>
<tr>
<td>N₂</td>
<td>1130</td>
<td>1236</td>
<td>1230</td>
<td>1353</td>
<td>1237</td>
</tr>
<tr>
<td>Mean</td>
<td>1145</td>
<td>1199</td>
<td>1243</td>
<td>1363</td>
<td>1238</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N =29.1 lb./ac.
S.E. of marginal mean of L =41.1 lb./ac.
S.E. of body of table =58.4 lb./ac.

Crop :- Masoor.
Site :- Adhartal Farm, Jabalpore.

Ref :- M.P. 51(30).
Type :- "M".

Object :- To find the economic manuring dose of N in the form of A/S and Ammo. Phos. for Masoor.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) Kabar (heavy clay). (b) Refer soil analysis, Jabalpore. (iii) 18.10.1951. (iv) (a) Bokharig. (b) N.A. (c) 40 lb./ac. (d) and (e) N.A. (x) N.A. (vi) A.A. 90. (vii) N.A. (viii) 1 weeding. (ix) N.A. (x) 8.3.1952.

2. TREATMENTS :
   All combinations of (1) and (2)+a control
   (1) 2 sources of N : N₁=Ammo. Phos. and N₂=A/S.
   (2) 4 levels of N : L₁=5, L₂=10, L₃=15 and L₄=20 lb./ac.

3. DESIGN :
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 33'×16'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Poor. Crop suffered for want of moisture. Scanty winter rains. (ii) Nil. (iii) Grain and fodder yield. (iv) 1948—N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Season was most unfavourable for the crop. (vii) Nil.

5. RESULTS :
   (i) 333.2 lb./ac.
   (ii) 44.80 lb./ac.
   (iii) "Control vs. others" effect alone is highly significant.
   (iv) Av. yield of grain in lb./ac.

Control =274.9 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>L₁</th>
<th>L₂</th>
<th>L₃</th>
<th>L₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N₁</td>
<td>340.7</td>
<td>349.8</td>
<td>353.2</td>
<td>361.0</td>
<td>351.2</td>
</tr>
<tr>
<td>N₂</td>
<td>325.1</td>
<td>322.2</td>
<td>329.7</td>
<td>338.4</td>
<td>329.6</td>
</tr>
<tr>
<td>Mean</td>
<td>334.4</td>
<td>336.0</td>
<td>341.4</td>
<td>349.7</td>
<td>340.4</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 9.12 lb./ac.
S.E. of marginal mean of L = 12.88 lb./ac.
S.E. of body of table = 18.3 lb./ac.
Crop :- Masoor.  
Site :- Adhartal Farm, Jabalpore. 

Ref :- M.P. 52(19). 
Type :- 'M'. 

Object :- To study the comparative effect of different doses of A/S and Ammo. Phos. on Masoor. 

1. BASAL CONDITIONS : 
(i) (a) to (c) N.A.  
(ii) (a) Kabar.  
(b) Refer soil analysis, Jabalpore.  
(iii) 16.0.1952.  
(iv) (a) and (b) N.A.  
(N) 40 lb./ac.  
(d) and (e) N.A.  
(v) N.A.  
(vi) Masoor.  
(vii) to (ix) N.A.  
(x) 23.2.1953. 

2. TREATMENTS : 
All combinations of (1) and (2) + a control 
(1) 2 sources of N : N1 = Ammo. Phos. and N2 = A/S.  
(2) 4 levels of N : L1=5, L2=10, L3=15 and L4=20 lb./ac. 

3. DESIGN : 
(i) R.B.D.  
(ii) (a) 9.  
(b) N.A.  
(iii) 6.  
(iv) (a) and (b) 33'X16'.  
(v) Nil.  
(vi) Yes. 

4. GENERAL : 
(i) Normal.  
(ii) N.A.  
(iii) Grain and straw yield.  
(iv) (a) 1948—N.A.  
(b) and (c) N.A.  
(v) (a) and (b) N.A.  
(vi) and (vii) Nil. 

5. RESULTS : 
(i) 478.6 lb./ac.  
(ii) 54.24 lb./ac.  
(iii) "Control vs. others" effect alone is highly significant.  
(iv) Av. yield of grain in lb./ac. 

<table>
<thead>
<tr>
<th></th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>493.3</td>
<td>483.2</td>
<td>508.1</td>
<td>528.1</td>
<td>503.2</td>
</tr>
<tr>
<td>N2</td>
<td>464.0</td>
<td>465.8</td>
<td>484.9</td>
<td>508.3</td>
<td>480.7</td>
</tr>
<tr>
<td>Mean</td>
<td>478.7</td>
<td>474.5</td>
<td>496.5</td>
<td>518.2</td>
<td>491.9</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N = 11.08 lb./ac.  
S.E. of marginal mean of L = 15.60 lb./ac.  
S.E. of body of table = 22.16 lb./ac. 

Crop :- Gram (Rabi).  
Site :- Institute of Plant Industry, Indore. 

Ref :- M.P. 48(15)  
Type :- 'M'. 

Object :- To find out suitable manurial dose for Gram. 

1. BASAL CONDITIONS : 
(i) (a) to (c) N.A.  
(ii) (a) Black cotton soil.  
(b) N.A.  
(iii) N.A.  
(iv) (a) Bokharing.  
(b) N.A. (c) 40 lb./ac.  
(d) 14'.  
(e) N.A.  
(v) N.A.  
(vi) Gram-07.  
(vii) N.A.  
(viii) Weeding and hoeing.  
(ix) and (x) N.A. 

2. TREATMENTS : 
All combinations of (1) and (2) 
(1) 3 levels of N as G.N.C. : N0=0, N1=20 and N2=40 lb./ac.  
(2) 3 levels of P2O5 as Super : P0=0, P1=20 and P2=40 lb./ac. 

3. DESIGN : 
(i) 3x3 Fact. in R.B.D.  
(ii) (a) 9.  
(b) N.A.  
(iii) 6.  
(iv) (a) N.A.  
(v) 10'X30'-4'.  
(vi) N.A.  
(vii) Yes. 

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

(i) 713.3 lb./ac.
(ii) 77.3 lb./ac.
(iii) P effect alone differs significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>724.1</td>
<td>616.4</td>
<td>679.2</td>
<td>673.2</td>
</tr>
<tr>
<td>P1</td>
<td>721.1</td>
<td>709.1</td>
<td>722.6</td>
<td>717.6</td>
</tr>
<tr>
<td>P2</td>
<td>792.9</td>
<td>721.1</td>
<td>733.0</td>
<td>749.0</td>
</tr>
<tr>
<td>Mean</td>
<td>746.0</td>
<td>682.2</td>
<td>711.6</td>
<td>713.3</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 18.1 lb./ac.
S.E. of body of table = 31.5 lb./ac.

Crop: Gram (Rabi).
Site: Institute of Plant Industry, Indore.
Ref: M.P. 48(18).
Type: ‘M’.

Object: To find out the suitable combination of N and P for Gram.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Sann. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Bakharing. (b) and (c) N.A. (d) 14’. (e) N.A. (v) Sann as G.M. (vi) Gram-707. (vii) N.A. (viii) Dora and weeding.

2. TREATMENTS:

All combinations of (1) and (2)
(1) 3 levels of N as G.N.C.: N0=0, N1=20 and N2=40 lb./ac.
(2) 3 levels of P2O5 as Super: P0=0, P1=20 and P2=40 lb./ac.

3. DESIGN:

(i) 3x3 Fac.t in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 14’x35’. (b) 10’x30’. (v) Two rows cm both sides and 2’ of each row at both ends. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Grain and fodder yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 460.6 lb./ac.
(ii) 85.9 lb./ac.
(iii) N effect is significant, P effect is highly significant, interaction N×P is not significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>391.9</td>
<td>445.8</td>
<td>372.5</td>
<td>403.4</td>
</tr>
<tr>
<td>P1</td>
<td>432.3</td>
<td>423.3</td>
<td>556.5</td>
<td>470.7</td>
</tr>
<tr>
<td>P2</td>
<td>514.6</td>
<td>496.6</td>
<td>511.6</td>
<td>507.6</td>
</tr>
<tr>
<td>Mean</td>
<td>446.3</td>
<td>455.2</td>
<td>480.2</td>
<td>460.6</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 20.2 lb./ac.
S.E. of body of table = 35.1 lb./ac.
Object: To study the response to graded doses of N applied singly and in combination with different doses of P\textsubscript{2}O\textsubscript{5}.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 31.11.1949. (iv) (a) to (c) N.A. (d) 14\textdegree. (e) N.A. (v) N.A. (vi) Gram 707. (vii) N.A. (viii) Weeding. (x) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N\textsubscript{0} = 0, N\textsubscript{1} = 20 and N\textsubscript{2} = 40 lb./ac.
   (2) 3 levels of P\textsubscript{2}O\textsubscript{5} as Super: P\textsubscript{0} = 0, P\textsubscript{1} = 20 and P\textsubscript{2} = 40 lb./ac.

3. DESIGN:
   (i) 3\times3 Factorial in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 10\times23\times4. (v) N.A. (vi) Yes.

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

5. RESULTS:
   (i) 575.3 lb./ac.
   (ii) 100.4 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N\textsubscript{0}</th>
<th>N\textsubscript{1}</th>
<th>N\textsubscript{2}</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P\textsubscript{0}</td>
<td>547.1</td>
<td>558.7</td>
<td>613.9</td>
<td>572.9</td>
</tr>
<tr>
<td>P\textsubscript{1}</td>
<td>597.5</td>
<td>566.5</td>
<td>583.9</td>
<td>582.6</td>
</tr>
<tr>
<td>P\textsubscript{2}</td>
<td>576.2</td>
<td>547.1</td>
<td>587.8</td>
<td>570.4</td>
</tr>
<tr>
<td>Mean</td>
<td>573.6</td>
<td>557.4</td>
<td>594.9</td>
<td></td>
</tr>
</tbody>
</table>

   S.E. of marginal mean of N or P = 23.69 lb./ac.
   S.E. of body of table = 40.56 lb./ac.

RATIONALE:

- Crop: Gram
- Site: Institute of Plant Industry, Indore
- Object: To study the response to graded doses of N applied singly and in combination with different doses of P\textsubscript{2}O\textsubscript{5}.
5. RESULTS:
(i) 543.0 lb./ac.
(ii) 130.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N</th>
<th>N_1</th>
<th>N_2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_0</td>
<td>493.5</td>
<td>50.0</td>
<td>556.5</td>
</tr>
<tr>
<td>P_1</td>
<td>541.5</td>
<td>594.0</td>
<td>529.5</td>
</tr>
<tr>
<td>P_2</td>
<td>508.5</td>
<td>573.0</td>
<td>520.5</td>
</tr>
<tr>
<td>Mean</td>
<td>514.5</td>
<td>579.0</td>
<td>535.5</td>
</tr>
</tbody>
</table>

S.E. of marginal mean cf N or P = 30.8 lb./ac.
S.E. of body of table = 53.4 lb./ac.

Crop :- Gram.
Site :- Institute of Plant Industry, Indore.
Ref :- M.P. 50(2).
Type :- 'N'.

Object :- To study the response to N and P_2O_5 applied singly and in combination of the yield of Gram.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) 14.10.1950.  (iv) (a) to (e) N.A.  (v) N.A.
(vi) Gram. 707 (medium).  (vii) Unirrigated.  (viii) and (ix) N.A.  (x) 10.3.1951.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of N as A/S : N_0 = 0 and N_1 = 20 lb./ac.
(2) 2 levels of P_2O_5 as Super : P_0 = 0 and P_1 = 20 lb./ac.

3. DESIGN:
(i) 2x2 Fact. in R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) 35°8' x 15°.  (b) 30°8' x 10°.  (v) 2' on either side.  (vi) Yes.

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

5. RESULTS:
(i) 641.8 lb./ac.
(ii) 101.3 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>N</th>
<th>N_1</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_0</td>
<td>630.0</td>
<td>578.2</td>
</tr>
<tr>
<td>P_1</td>
<td>611.1</td>
<td>698.1</td>
</tr>
<tr>
<td>Mean</td>
<td>645.5</td>
<td>638.1</td>
</tr>
</tbody>
</table>

S.E. of marginal mean of N or P = 29.9 lb./ac.
S.E. of body of table = 41.4 lb./ac.
Crop: Gram.  
Site: Institute of Plant Industry, Indore.

Object: To study the response to N and P\textsubscript{2}O\textsubscript{5} applied singly and in combination of the yield of Gram.

1. **BASAL CONDITIONS:**
   
   (i) (a) N.A.  (b) and (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) N.A.  (iv) (a) to (e) N.A.  (v) N.A.  (vi) Gram.  (vii) Irrigated.  (viii) N.A.

2. **TREATMENTS:**
   
   All combinations of (1) and (2)
   
   (1) 2 levels of N as A/S: N\textsubscript{0} = 0 and N\textsubscript{1} = 20 lb./ac.
   
   (2) 2 levels of P\textsubscript{2}O\textsubscript{5} as Super: P\textsubscript{0} = 0 and P\textsubscript{1} = 10 lb./ac.

3. **DESIGN:**
   
   (i) 2 x 2 Factorial in R.B.D.  (ii) 4.  (b) N.A.  (iii) 6.  (iv) 30' x 15'.  (v) 6' x 10'.  (vi) Yes.

4. **RESULTS:**
   
   (i) 465.9 lb./ac.
   
   (ii) 94.8 lb./ac.
   
   (iii) None of the effects is significant.
   
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N\textsubscript{0}</th>
<th>N\textsubscript{1}</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P\textsubscript{0}</td>
<td>431.8</td>
<td>489.5</td>
<td>460.7</td>
</tr>
<tr>
<td>P\textsubscript{1}</td>
<td>483.6</td>
<td>458.5</td>
<td>471.1</td>
</tr>
<tr>
<td>Mean</td>
<td>457.7</td>
<td>474.0</td>
<td>465.9</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 27.2 lb./ac.

S.E. of body of table = 30.7 lb./ac.

---

Crop: Gram.  
Site: Adhartal Farm, Jabalpur.

Object: To see the effect of manuring Gram with Super at different levels and its residual effect on Wheat.

1. **BASAL CONDITIONS:**
   
   (i) to (v) N.A.  (vi) Barab.  (b) Refer soil analysis, Jabalpur.  (iii) 7.10.1950.  (iv) (a) to (e) N.A.  (c) 60 lb./ac.  (d) and (e) N.A.  (v) N.A.  (vi) to (ix) N.A.  (x) 12.3.1951.

2. **TREATMENTS:**
   
   5 levels of P\textsubscript{2}O\textsubscript{5} as Super: P\textsubscript{0} = 0, P\textsubscript{1} = 15, P\textsubscript{2} = 20, P\textsubscript{3} = 25 and P\textsubscript{4} = 30 lb./ac.

3. **DESIGN:**
   
   (i) R.B.D.  (ii) 5.  (b) N.A.  (iii) 4.  (iv) (a) to (b) 66' x 16'.  (v) Nil.  (vi) Yes.

4. **GENERAL:**
   
   (i) Germination and growth in the initial stage was satisfactory.  The growth of the crop suffered due to frost which occurred on 25 and 26.1.1950.  The damage was uniform in all the plots.  (ii) Nil.  (iii) Grain and straw yield.  (iv) (a) 1950-1955.  (b) and (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.
5. RESULTS:
   (i) 626.4 lb./ac.
   (ii) 54.08 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>533.0</td>
</tr>
<tr>
<td>P₁</td>
<td>597.4</td>
</tr>
<tr>
<td>P₂</td>
<td>619.3</td>
</tr>
<tr>
<td>P₃</td>
<td>665.9</td>
</tr>
<tr>
<td>P₄</td>
<td>716.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>27.04 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Gram.  
Site : Adhartal Farm, Jabalpore.  
Ref : M.P. 51(28).  
Type : 'M'.

Object : - To see the effect of manuring Gram with super.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  
   (ii) (a) Kabar.  
   (b) Refer soil analysis, Jabalpore.  
   (iii) 22.10.1951.  
   (iv) (a) Bakharing.  
   (b) N.A.  
   (c) 60 lb./ac.  
   (d) and (e) N.A.  
   (v) N.A.  
   (vi) Unirrigated.  
   (vii) Nil.  
   (ix) N.A.  
   (x) 29.3.1952.

2. TREATMENTS:
   5 levels of P₂O₅ as Super: P₀=0, P₁=15, P₂=20, P₃=25 and P₄=30 lb./ac.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 5.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) and (b) 66' x 16'.  
   (v) Nil.  
   (vi) Yes.

4. GENERAL:
   (i) In the beginning the growth was satisfactory and later it suffered for want of moisture in the soil.  
   (ii) Nil.  
   (iii) Grain and straw yield.  
   (iv) (a) 1950 to 1955.  
   (b) and (c) N.A.  
   (v) (a) and (b) N.A.  
   (vi) Season was not favourable for the crop.  
   (vii) Nil.

5. RESULTS:
   (i) 487.5 lb./ac.  
   (ii) 125.6 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>419.0</td>
</tr>
<tr>
<td>P₁</td>
<td>454.0</td>
</tr>
<tr>
<td>P₂</td>
<td>505.9</td>
</tr>
<tr>
<td>P₃</td>
<td>538.9</td>
</tr>
<tr>
<td>P₄</td>
<td>529.6</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>62.8 lb./ac.</td>
</tr>
</tbody>
</table>

Crop : Gram.  
Site : Adhartal Farm, Jabalpore.  
Ref : M.P. 52(28).  
Type : 'M'.

Object : - To see the effect of different doses of Super on Gram and its residual effect on wheat.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  
   (ii) (a) Kabar.  
   (b) Refer soil analysis, Jabalpore.  
   (iii) 15.10.1952.  
   (iv) 'a', (b) N.A.  
   (c) 60 lb./ac.  
   (d) and (e) N.A.  
   (v) N.A.  
   (vi) Adt. V.  
   (vii) to (ix) N.A.  
   (x) 10.3.1953.

2. TREATMENTS:
   5 levels of P₂O₅ as Super: P₀=0, P₁=15, P₂=20, P₃=25 and P₄=30 lb./ac.
3. DESIGN:
(i) R.B.D. (ii) (a) 5 (b) N.A. (iii) 4. (iv) (a) and (b) 66' X 161'. (v) 2 feet space was left between two plots. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1955. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 388.3 lb./ac.
(ii) 36.00 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.  
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>305.0</td>
</tr>
<tr>
<td>P₁</td>
<td>366.8</td>
</tr>
<tr>
<td>P₂</td>
<td>388.1</td>
</tr>
<tr>
<td>P₃</td>
<td>400.6</td>
</tr>
<tr>
<td>P₄</td>
<td>481.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=18.00 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Gram.  
Site :- Adhartal Farm, Jabalpore.  
Ref :- M.P. 53.(8).  
Type :- 'M'.

Object :- To see the effect of different doses of super on Gram and its residual effect on wheat.

1. BASAL CONDITIONS:
(i) (a) Gram-wheat-gram. (b) Wheat. (c) Nil. (ii) (a) Kabur 2. (b) Refer soil analysis, Jabalpore. (iii) 28.10.1953. (iv) (a) Bakharing. (b) N.A. (c) 60 lb./ac. (d) and (e) N.A. (v) N.A. (vi) Adt V. (vii) Unirrigated (viii) N.A. (ix) 0.98'. (x) N.A.

2. TREATMENTS:
5 levels of P₂O₅ as Super : P₀=0, P₁=15, P₂=20, P₃=25 and P₄=30 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) and (b) 66' X 161'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) Good. Growth in manured plots was better than in unmanured. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1955. (b) Alternate years. (c) N.A. (v) (a) Powarkhed. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 218.8 lb./ac.
(ii) 122.4 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.  
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>218.1</td>
</tr>
<tr>
<td>P₁</td>
<td>213.3</td>
</tr>
<tr>
<td>P₂</td>
<td>259.3</td>
</tr>
<tr>
<td>P₃</td>
<td>253.8</td>
</tr>
<tr>
<td>P₄</td>
<td>149.9</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=61.2 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Gram.  

Site :- Govt. Seed and Demonstration Farm, Saugor.  

Ref :- M.P. 48(21).  

Type :- 'M'.  

Object :- To study the residual effect of N manures applied to the previous wheat crop on the succeeding Gram crop.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) Kabar 2. (b) N.A. (iii) 23.10.1948. (iv) (a) 3 bakharing. (b) Sown with nari plough. (c) to (e) N.A. (vi) Nil. (vii) N.A. (viii) Nil. (ix) N.A. (x) 10.3.1949.

2. TREATMENTS :
   1. Control (no manure).
   2. T.C. at 10 C.L./ac.
   3. T.C. at 20 C.L./ac.
   4. F.Y.M. at 10 C.L./ac.
   5. F.Y.M. at 20 C.L./ac.
   6. G.N.C. at 4 md./ac.
   7. A/S at 120 lb./ac.
   Manures applied to previous wheat crop.

3. DESIGN :
   (i) R.B.D. (ii) (a) 7. (b) N.A. (iii) 6. (iv) (a) and (b) 66' x 16'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) Satisfactory. (ii) Nil. (iii) Grain and straw yield. (iv) (a) 1948-1949. (b) and (c) N.A. (v) (a) Jabalpur (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 1180 lb./ac.
   (ii) 29.60 lb./ac.
   (iii) Treatments differ highly significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1034</td>
</tr>
<tr>
<td>2.</td>
<td>1167</td>
</tr>
<tr>
<td>3.</td>
<td>1237</td>
</tr>
<tr>
<td>4.</td>
<td>1201</td>
</tr>
<tr>
<td>5.</td>
<td>1241</td>
</tr>
<tr>
<td>6.</td>
<td>1261</td>
</tr>
<tr>
<td>7.</td>
<td>1121</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=12.08 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Gram.  

Site :- Govt. Seed and Demonstration Farm, Saugor.  

Ref :- M.P. 49(27).  

Type :- 'M'.  

Object :- To study the residual effect of N manures applied to the previous wheat crop on the succeeding Gram crop.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Wheat. (c) As per treatments. (ii) (a) Kabar 2. (b) N.A. (iii) 13.11.1949. (iv) (a) Bakharing. (b) Sown with nari plough. (c) to (e) N.A. (v) Nil. (vi) Gram V. (vii) Nil. (viii) Nil. (ix) N.A. (x) 7.4.950.

2. TREATMENTS :
   1. Control.  
   2. T.C. at 20 lb./ac. of N.  
   3. T.C. at 40 lb./ac. of N.  
   4. F.Y.M. at 20 lb./ac. of N.  
   5. F.Y.M. at 40 lb./ac. of N.  
   6. G.N.C. at 10 lb./ac. of N.  
   7. G.N.C. at 20 lb./ac. of N.  
   8. A/S at 10 lb./ac. of N.  
   9. A/S at 20 lb./ac. of N.  
   Manures applied to previous wheat crop.
3. DESIGN:
(i) R.B.D.  (ii) [a] 9.  (b) N.A.  (iii) 6.  (iv) [a] and [b] 66' × 16'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) Satisfactory in the beginning but suffered for want of moisture at later stage.  (ii) Nil.  (iii) Grain yield.  (iv) (a) 1948-1949.  (b) and (c) N.A.  (v) (a) Jabalpur.  (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 69.2 lb./ac.
(ii) 88.80 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>457.9</td>
<td>6.</td>
<td>488.6</td>
</tr>
<tr>
<td>2.</td>
<td>462.2</td>
<td>7.</td>
<td>495.2</td>
</tr>
<tr>
<td>3.</td>
<td>445.2</td>
<td>8.</td>
<td>465.2</td>
</tr>
<tr>
<td>4.</td>
<td>475.2</td>
<td>9.</td>
<td>446.9</td>
</tr>
<tr>
<td>5.</td>
<td>504.0</td>
<td>S.E./mean</td>
<td>-36.40 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Gram.
Sit e :- Govt. Expl. Farm, Powarkheda.
Re f :- M.P. 50(32).
Type :- 'M'.

Object :- To study the residual effect of the manures applied to wheat during 1947-1948 on its yield in two succeeding years 1948-49 and 1949-50 and on Gram during 1950-1951.

1. BASAL CONDITIONS:
(i) (a) N.A.  (b) Wheat.  (c) Nil.  (ii) (a) Clay loam (marvay).  (b) Refer soil analysis, Powarkheda.  (iii) 7.11.1950.  (iv) (a) Bakharing.  (b) N.A.  (c) 10 lb./ac.  (d) and (e) N.A.  (v) N.A.  (vi) Ad. V.  (vii) Unirrigated.  (viii) N.A.  (ix) 2.11'. (x) 27.2.1951.

2. TREATMENTS:
1. Control.
2. T.C. at 10 C.L./ac. before monsoon.
3. T.C. at 20 C.L./ac. before monsoon.
4. F.Y.M. at 10 C.L./ac. applied before monsoon.
5. F.Y.M. at 20 C.L./ac. applied before monsoon.
6. G.N.C. at 4 nd./ac. applied at the time of sowing.
7. A/S at 110 lb./ac. drilled with seed.

3. DESIGN:
(i) R.B.D.  (ii) [a] 7.  (b) N.A.  (iii) 6.  (iv) [a] and [b] 16' × 66'.  (v) Nil.  (vi) N.A.

4. GENERAL:
(i) and (ii) N.A.  (iii) Grain yield.  (iv) (a) 1950-1951.  (b) Yes.  (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:
(i) 810.9 lb./ac.
(ii) 68.52 lb./ac.
(iii) Treatments differ highly significantly.
(iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>786.1</td>
</tr>
<tr>
<td>2.</td>
<td>824.9</td>
</tr>
<tr>
<td>3.</td>
<td>879.5</td>
</tr>
<tr>
<td>4.</td>
<td>834.5</td>
</tr>
<tr>
<td>5.</td>
<td>896.6</td>
</tr>
<tr>
<td>6.</td>
<td>764.5</td>
</tr>
<tr>
<td>7.</td>
<td>690.3</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 27.96 lb./ac.</td>
</tr>
</tbody>
</table>
Object:—To study the residual effect of T.C. and other fertilizers applied to wheat during 1948-49 on the succeeding crop wheat during 1949-50 and on Gram during 1950-51.

1. BASAL CONDITIONS:
   (i) N.A. (b) Wheat. (c) Nil. (ii) (a) Clay loam (mariyar). (b) Refer soil analysis, Powarkheda. (iii) 12.10.1950. (iv) (a) Baklaring. (b) and (c) N.A. (d) 12'. (e) N.A. (v) Nil. (vi) Ad. V. (vii) N.A. (viii) Nil. (ix) 2.11'. (x) 4.3.1951.

2. TREATMENTS:
   1. Control.
   2. T.C. at 20 lb./ac. of N applied before monsoon.
   3. T.C. at 40 lb./ac. of N applied before monsoon.
   4. F.Y.M. at 20 lb./ac. of N applied before monsoon.
   5. F.Y.M. at 40 lb./ac. of N applied before monsoon.
   6. G.N.C. at 10 lb./ac. of N applied in September 1948.
   7. G.N.C. at 10 lb./ac. of N applied in September 1948.
   8. A/S at 10 lb./ac. of N drilled with seed.
   9. A/S at 20 lb./ac. of N drilled with seed.
   Applied during 1948-49 for wheat crop.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) and (b) 11'x99'. (v) Nil. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Grain yield. (iv) (a) 1948–1952. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 738.6 lb./ac.
   (ii) 96.4 lb./ac.
   (iii) Treatments do not differ significantly.
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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<tr>
<td>1.</td>
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<td>6.</td>
<td>715.3</td>
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<td>681.1</td>
<td>7.</td>
<td>717.8</td>
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<td>3.</td>
<td>767.0</td>
<td>8.</td>
<td>725.3</td>
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<tr>
<td>4.</td>
<td>803.7</td>
<td>9.</td>
<td>733.7</td>
</tr>
<tr>
<td>5.</td>
<td>818.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 39.4 lb./ac.

Crop := Cotton.
Ref:= M.P. 83(107).
Site := Institute of Plant Industry, Indore.
Type := 'M'.

Object:—To study the effect of soaking Cotton seeds in solutions of trace elements.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Indore 1. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)+9 controls
   (1) 3 salts: $S_1 = CuSO_4$, $S_2 = Potassium Chromate$ and $S_3 = Chromium Sulphate$.
   (2) 3 concentrations: $C_1 = M/50$, $C_2 = M/100$ and $C_3 = M/200$.
   (3) 3 periods of soaking: $T_1 = 2$, $T_2 = 4$ and $T_3 = 6$ hours.

3. DESIGN:
   (i) R.B.D. (ii) (a) 36. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 56'x99'. (v) N.A. (vi) Yes.
4. GENERAL:
(i) N.A. (ii) N.A. (iii) Kapas yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
(i) 102 lb./ac.
(ii) 26.17 lb./ac.
(iii) Only interaction $S \times T$ is significant.
(iv) Av. yield of Kapas in lb./ac.

Control = 103 lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>Mean</th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_1$</td>
<td>94</td>
<td>89</td>
<td>99</td>
<td>94</td>
<td>111</td>
<td>97</td>
<td>74</td>
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<tr>
<td>$T_2$</td>
<td>102</td>
<td>104</td>
<td>113</td>
<td>106</td>
<td>104</td>
<td>88</td>
<td>127</td>
</tr>
<tr>
<td>$T_3$</td>
<td>99</td>
<td>103</td>
<td>111</td>
<td>104</td>
<td>109</td>
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<tr>
<td>Mean</td>
<td>98</td>
<td>99</td>
<td>107</td>
<td>101</td>
<td>108</td>
<td>96</td>
<td>101</td>
</tr>
<tr>
<td>$S_1$</td>
<td>106</td>
<td>101</td>
<td>116</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$S_2$</td>
<td>86</td>
<td>95</td>
<td>106</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$S_3$</td>
<td>103</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 6.17 lb./ac.
S.E. of body of any table = 10.69 lb./ac.

Crop :- Cotton.
Site :- Institute of Plant Industry, Indore.

Ref :- M.P. 53(106).
Type :- 'M'.

Object :- To test the effect of applying trace elements to soil on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) Nil. (vi) Indore 1. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2) + 4 control plots
1. 4 trace elements : $T_1$ = Chromium Sulphate, $T_2$ = Mn $S_0_4$, $T_3$ = Borax and $T_4$ = Pot. Chromate.
2. 4 doses of trace elements : $D_1$ = 0.5, $D_2$ = 1.0, $D_3$ = 1.5 and $D_4$ = 2.0 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 20. (b) N.A. (iii) 4. (iv) (a) N.A.(b) 56'X9'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Kapas yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
(i) 105 lb./ac.
(ii) 25.28 lb./ac.
(iii) Only interaction $D \times T$ is significant.
Crop :- Cotton (Kharif).
Site :- Institute of Plant Industry, Indore.
Object :- To find out the effect of spraying trace elements on Cotton crop.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 28.6.1951. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)+2 control plots.
   1. 5 trace elements : T\(_1\) = Copper, T\(_2\) = Boron, T\(_3\) = Zinc, T\(_4\) = Chromium and T\(_5\) = Manganese.
   2. 2 concentrations : C\(_1\) = 0.5 and C\(_2\) = 1.0 %.
   Spraying on 22.8 1951 at 80 gallon/ac.

3. DESIGN :
   (i) R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) N.A. (b)1/207.6 ac. (v) N.A. (vi) Yes.

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

5. RESULTS :
   (i) 534 lb./ac.
   (ii) 61.86 lb./ac.
   (iii) Only 'control vs other treatments' effect is significant.
   (iv) Av. yield of kapas in lb./ac.

   Control=483 lb./ac.

<table>
<thead>
<tr>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>( T_4 )</th>
<th>( T_5 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>536</td>
<td>531</td>
<td>530</td>
<td>566</td>
<td>546</td>
<td>542</td>
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<tr>
<td>527</td>
<td>541</td>
<td>526</td>
<td>579</td>
<td>560</td>
<td>547</td>
</tr>
<tr>
<td>Mean</td>
<td>532</td>
<td>536</td>
<td>528</td>
<td>573</td>
<td>553</td>
</tr>
</tbody>
</table>

S.E. of T marginal means = 21.87 lb./ac.
S.E. of C marginal means = 13.83 lb./ac.
S.E. of body of table = 30.93 lb./ac.
Crop: Cotton (Kharif).
Site: Institute of Plant Industry, Indore.

Object: To find out the effect of burning stubbles and ash on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2) + a control
   (1) 2 manures: S1 = Burning stubbles and S2 = Ash.
   (2) 2 doses: D1 = Single and D2 = Double.

3. DESIGN:
   (i) R.B.D. (ii) S. (iii) N.A. (iv) 4. (v) (a) N.A. (b) 21' x 42'. (vi) N.A.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Kapas yield. (iv) (a) No. (b) and (c) N.A. (v) (a) N.A. (v) N.A. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.)

5. RESULTS:
   (i) 911 lb./ac.
   (ii) 44.40 lb./ac.
   (iii) Only S and 'control vs treated' effects are highly significant.
   (vi) Av. yield of Kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S1</td>
</tr>
<tr>
<td>D1</td>
<td>996</td>
</tr>
<tr>
<td>D2</td>
<td>1067</td>
</tr>
<tr>
<td>Mean</td>
<td>1031</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 15.70 lb./ac.
S.E. of body of table = 22.20 lb./ac.

Crop: Cotton (Kharif).
Site: Institute of Plant Industry, Indore.

Object: To find out the effect of burning stubbles on early sown Cotton.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   1. Control.
   2. Burning stubbles.

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

4. GENERAL:
   (i) and (ii) N.A. (iii) Kapas yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment was conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
   (i) 386 lb./ac.
   (ii) 39.50 lb./ac.
   (iii) Treatment difference is not significant.
(iv) Av. yield of kapas in lb./ac.

Treatment  | Av. yield  | S.E./mean
---|---|---
1. | 367 | 19.75 lb./ac.
2. | 404 |

---

Crop: Cotton.  
Site: Institute of Plant Industry, Indore.  
Ref: M.P. 49 (68).  
Type: 'M'.

Object: To find out the effect of burning stubbles on late sown Cotton.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  
   (ii) (a) Black cotton soil.  
   (iii) N.A.  
   (iv) (a) to (e) N.A.  
   (v) and (vi) N.A.  
   (vii) Unirrigated.  
   (viii) to (x) N.A.

2. TREATMENTS:
   1. Control.  
   2. Burning stubbles.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 2.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) N.A.  
   (b) 6'X30'.  
   (v) and (vi) N.A.

4. GENERAL:
   (i) and (ii) N.A.  
   (iii) Kapas yield.  
   (iv) (a) to (c) N.A.  
   (v) (a) and (b) N.A.  
   (vi) Nil.  
   (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C).

5. RESULTS:
   (i) 173 lb./ac.  
   (ii) 69.89 lb./ac.  
   (iii) Treatment difference is not significant.  
   (iv) Av. yield of kapas in lb./ac.

Treatment  | Av. yield  | S.E./mean
---|---|---
1. | 133 | 30.45 lb./ac.
2. | 212 |

---

Crop: Cotton (Kharif).  
Site: Institute of Plant Industry, Indore.  
Ref: M.P. 49(66).  
Type: 'M'.

Object: To find out the effect of soaking seed in chemical solutions.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  
   (ii) (a) Black cotton soil.  
   (iii) N.A.  
   (iv) (a) to (e) N.A.  
   (v) N.A.  
   (vi) N.A.  
   (vii) Unirrigated.  
   (viii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3) + 3 controls (seeds soaked in water for 4 hours).
   1. 4 chemical solutions: \( S_1 = \text{Glysin}, S_2 = \text{Sodium Nitro Prusside}, S_3 = \text{Ferrous Ammo. Sul.} \) and \( S_4 = \text{Uranium acetate.} \)
   2. 3 concentrations of solutions: \( C_1 = m/100, C_2 = m/200 \) and \( C_3 = m/500. \)
   3. 2 periods of soaking seeds: \( T_1 = 2 \) and \( T_2 = 4 \) hours.

3. DESIGN:
   (i) R.B.D.  
   (ii) (a) 27.  
   (b) N.A.  
   (iii) 4.  
   (iv) (a) N.A.  
   (b) 4'X40'.  
   (v) N.A.  
   (vi) N.A.

4. GENERAL:
   (i) N.A.  
   (ii) N.A.  
   (iii) Kapas yield.  
   (iv) (a) to (c) N.A.  
   (v) (a) and (b) N.A.  
   (vi) and (vii) Nil.
5. RESULTS:

(i) 186 lb./ac.
(ii) 40.16 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of cotton in lb./ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>$S_4$</th>
<th>Mean</th>
<th>$T_1$</th>
<th>$T_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>182</td>
</tr>
<tr>
<td>$C_2$</td>
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<td>204</td>
<td>179</td>
<td>194</td>
<td>179</td>
<td>184</td>
<td>173</td>
</tr>
<tr>
<td>Mean</td>
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<td>176</td>
<td>209</td>
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<td></td>
<td></td>
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<tr>
<td>$T_2$</td>
<td>175</td>
<td>172</td>
<td>183</td>
<td>193</td>
<td>193</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of $S$ marginal mean = 8.20 lb./ac.
S.E. of $C$ marginal mean = 7.10 lb./ac.
S.E. of $T$ marginal mean = 5.60 lb./ac.
S.E. of body of $S\times C$ table = 14.20 lb./ac.
S.E. of body of $C\times T$ table = 10.04 lb./ac.
S.E. of body of $S\times T$ table = 11.59 lb./ac.

Crop: Cotton (Kharif).
Site: Institute of Plant Industry, Indore.
Ref: M. P. 49(17).
Type: 'M'.

Object: To find out the effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

1. Control
2. $Mg$ at 40 lb./ac.
3. $Mo$ at 14 lb./ac.
4. $Ca$ at 80 lb./ac.
5. $Co$ at 10 lb./ac.
6. $Cu$ at 24 lb./ac.
7. $Zn$ at 20 lb./ac.
8. $B$ at 10 lb./ac.
9. $Mn$ at 20 lb./ac.
10. $Fe$ at 30 lb./ac.
11. $Cr$ at 2 lb./ac.
12. $Cu$ at 24 lb./ac. + $Zn$ at 20 lb./ac.
13. $Mn$ at 20 lb./ac. + $Fe$ at 30 lb./ac.
14. $B$ at 10 lb./ac. + $Ca$ at 80 lb./ac.

3. DESIGN:

(i) R.B.D. (ii) (a) 14. (b) N.A. (iii) 6. (iv) (a) N.A. (b) $T\times 27$. (v) N.A. (vi) N.A.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Kanar yield. (iv) (a) No. (b) and (c) N.I.I. (v) (a) N.A. (b) Nil. (vi) N.I.I. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:

(i) 358 lb./ac.
(ii) 59.64 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of *Kapas* in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>344</td>
</tr>
<tr>
<td>2.</td>
<td>336</td>
</tr>
<tr>
<td>3.</td>
<td>311</td>
</tr>
<tr>
<td>4.</td>
<td>335</td>
</tr>
<tr>
<td>5.</td>
<td>393</td>
</tr>
<tr>
<td>6.</td>
<td>403</td>
</tr>
<tr>
<td>7.</td>
<td>400</td>
</tr>
</tbody>
</table>

S.E./mean = 24.27 lb./ac.

Crop: Cotton.

Site: Institute of Plant Industry, Indore.

Ref: M.P. 48(48).

Object: To find out the effect of trace elements on the growth and yield of *American* Cotton.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) to (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS**:
   1. Control.
   2. Magnesium (Mg) at 40 lb./ac.
   3. Zinc (Zn) at 20 lb./ac.
   4. Iron (Fe) at 30 lb./ac.
   5. Copper (Cu) at 24 lb./ac.
   6. Manganese (Mn) at 20 lb./ac.
   7. Chromium (Cr) at 2 lb./ac.
   8. Molybdenum (Mo) at 14 lb./ac.
   9. Boron (B) at 20 lb./ac.

3. **DESIGN**:
   (i) R.B.D. (ii) 9. (b) N.A. (iii) T.R.D. (iv) (a) N.A. (b) 4' × 36'. (v) and (vi) N.A.

4. **GENERAL**:
   (i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. **RESULTS**:
   (i) 520 lb./ac.
   (ii) 72.24 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of *Kapas* in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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</tr>
<tr>
<td>2.</td>
<td>454</td>
</tr>
<tr>
<td>3.</td>
<td>532</td>
</tr>
<tr>
<td>4.</td>
<td>458</td>
</tr>
<tr>
<td>5.</td>
<td>608</td>
</tr>
</tbody>
</table>

S.E./mean = 41.71 lb./ac.

---

Crop: Cotton.

Ref: M.P. 48(48).

Site: Institute of Plant Industry, Indore.

Type: 'M'.

Object: To find out the effect of trace elements on the yield of Cotton.

1. **BASAL CONDITIONS**:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.
2. TREATMENTS:

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Control</th>
<th>Mo</th>
<th>B</th>
<th>Cu</th>
<th>Mg</th>
<th>Fe</th>
<th>Mn</th>
<th>Zn</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity applied during 1947</td>
<td>—</td>
<td>14</td>
<td>20</td>
<td>21</td>
<td>40</td>
<td>30</td>
<td>20</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Quantity applied during 1948</td>
<td>—</td>
<td>7</td>
<td>10</td>
<td>12</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>

Doses applied in lb./ac.

3. DESIGN:

(i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) $7.5' \times 33'$. (b) $6' \times 27'$. (v) and (vi) N.A.

4. GENERAL:

(i) and (ii) N.A. (iii) Kaper yield. (iv) (a) 1947-1952. (b) and (c) N.A. (v) (a) and (c) N.A. (vi) Nil.

(vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.)

5. RESULTS:

(i) 448 lb./ac.

(ii) (a) 93.63 lb./ac. (b) 52.19 lb./ac.

(iii) Effect of N and trace elements are significant. Interaction is not significant.
(b) Av. yield of *Kopas* in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Mo</th>
<th>B</th>
<th>Cu</th>
<th>Mg</th>
<th>Fe</th>
<th>Mn</th>
<th>Zn</th>
<th>Cr</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N_0</td>
<td>309</td>
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<td>431</td>
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<td>353</td>
<td>387</td>
<td>409</td>
<td>458</td>
<td>391</td>
</tr>
<tr>
<td>N_1</td>
<td>416</td>
<td>483</td>
<td>520</td>
<td>485</td>
<td>484</td>
<td>487</td>
<td>540</td>
<td>513</td>
<td>552</td>
<td>505</td>
</tr>
<tr>
<td>Mean</td>
<td>397</td>
<td>426</td>
<td>476</td>
<td>461</td>
<td>426</td>
<td>420</td>
<td>463</td>
<td>461</td>
<td>505</td>
<td>445</td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. main-plot marginal means = 25.48 lb./ac.
2. sub-plot marginal means = 30.13 lb./ac.
3. sub-plot treatment means at a level of main-plot treatment = 42.61 lb./ac.
4. main-plot treatment means at a level of sub-plot treatment = 47.58 lb./ac.

Crop: Cotton.
Site: Institute of Plant Industry, Indore.
Ref: M.P. 56(70).
Type: 'M'.

Object: To find out the residual effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) American. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   Treatment | Control | Mo | B   | Cu | Mg  | Fe  | Mn | Zn | Cr |
   ----------|---------|----|-----|----|-----|-----|----|----|----|
   Quantity applied during 1947. | — | 14 | 20 | 24 | 40 | 30 | 20 | 23 | 2 |
   Quantity applied during 1948. | 7 | 10 | 12 | 20 | 15 | 10 | 10 | 2 |
   Quantity applied during 1949. | — | 7 | 10 | 12 | 20 | 15 | 10 | 10 | 2 |
   Doses applied in lb./ac. Residual effect studied.

3. DESIGN:
   (i) R.B.D. (ii) 9. (b) N.A. (iii) 6. (iv) (a) 7½' x 53'. (b) 6' x 30'. (v) N.A. (vi) N.A.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Kopas yield. (iv) (a) 1947 to 1952. (b) Yes. (c) Nil. (vi) (a), (b) and N.A. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
   (i) 254 lb./ac.
   (ii) 42.32 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of *kopas* in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>225</td>
<td>Fe</td>
<td>257</td>
</tr>
<tr>
<td>Mo</td>
<td>249</td>
<td>Mn</td>
<td>276</td>
</tr>
<tr>
<td>B</td>
<td>254</td>
<td>B</td>
<td>251</td>
</tr>
<tr>
<td>Cu</td>
<td>259</td>
<td>Cr</td>
<td>264</td>
</tr>
<tr>
<td>Mg</td>
<td>247</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean 17.28 lb./ac.
Crop: Cotton (*Kharif*).
Site: Institute of Plant Industry, Indore.

Object: To find out the residual effect of trace elements on growth and yield of Cotton.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) American cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS:**
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Control</th>
<th>Mo</th>
<th>B</th>
<th>Cu</th>
<th>Mg</th>
<th>Fe</th>
<th>Mn</th>
<th>Zn</th>
<th>Cr</th>
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<tr>
<td>Quantity applied during 1947</td>
<td>14</td>
<td>22</td>
<td>24</td>
<td>4.3</td>
<td>39</td>
<td>20</td>
<td>20</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Quantity applied during 1948</td>
<td>7</td>
<td>13</td>
<td>12</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Quantity applied during 1949</td>
<td>7</td>
<td>10</td>
<td>12</td>
<td>22</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Doses applied in lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 7' x 33'. (b) 6' x 30'. (v) and (vi) N.A.

4. **GENERAL:**
   (i) and (ii) N.A. (iii) Kapas yield. (iv) (a) 1947—1952. (b) Yes. (c) N.A. (v) a and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme: I.C.C.C.C.

5. **RESULTS:**
   (i) 494 lb./ac.
   (ii) 54-42 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) | Av. yield of *Kapar* in lb./ac. |
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
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</tr>
<tr>
<td>Mo</td>
<td>518</td>
</tr>
<tr>
<td>B</td>
<td>515</td>
</tr>
<tr>
<td>Cu</td>
<td>507</td>
</tr>
<tr>
<td>Mg</td>
<td>478</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>22.22 lb./ac.</td>
</tr>
</tbody>
</table>

Crop: Cotton (*Kharif*).
Site: Institute of Plant Industry, Indore.

Object: To find out the residual effect of trace elements on growth and yield of Cotton.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) American cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS:**
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Control</th>
<th>Mo</th>
<th>B</th>
<th>Cu</th>
<th>Mg</th>
<th>Fe</th>
<th>Mn</th>
<th>Zn</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity applied during 1947</td>
<td>14</td>
<td>20</td>
<td>24</td>
<td>40</td>
<td>30</td>
<td>20</td>
<td>20</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Quantity applied during 1948</td>
<td>7</td>
<td>10</td>
<td>12</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Quantity applied during 1949</td>
<td>7</td>
<td>10</td>
<td>12</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Doses applied in lb./ac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 7' x 33'. (b) 6' x 30'. (v) 1.5' x 0.75'. (vi) N.A.

4. **GENERAL:**
   (i) and (ii) N.A. (iii) Kapas yield. (iv) (a) 1947—1952. (b) Yes. (c) N.A. (v) a and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme.
RESULTS:
(i) 537 lb./ac.
(ii) 73.96 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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<tr>
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<td>Fe</td>
<td>537</td>
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<tr>
<td>Mo</td>
<td>526</td>
<td>Mn</td>
<td>526</td>
</tr>
<tr>
<td>B</td>
<td>530</td>
<td>Zn</td>
<td>565</td>
</tr>
<tr>
<td>Cu</td>
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<td>Cr</td>
<td>536</td>
</tr>
<tr>
<td>Mg</td>
<td>528</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E./mean = 30.20 lb./ac.

Crop :-Cotton (Kharif).
Site :-Institute of Plant Industry, Indore.

Ref :- M.P. 49(63). Type :-‘M’.

Object :- To find out the effect of trace elements, with and without F.Y.M. on Cotton.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Unirrigated. (vii) to (x) N.A.

2. TREATMENTS:

Main-plot treatments:
2 levels of N as F.Y.M. : N₀ = 0 and N₁ = 20 lb./ac.

Sub-plot treatments:
16 trace elements : M₀ = Control, M₁ = 20 lb./ac. of Zn, M₂ = 20 lb./ac. of Cr, M₃ = 24 lb./ac. of Cu, M₄ = 20 lb./ac. of B, M₅ = 20 lb./ac. of Mn, M₆ = M₁ + M₄, M₇ = M₂ + M₃, M₈ = M₉ = M₁ + M₄, M₁₀ = M₃ + M₄, M₁₁ = M₄ + M₅, M₁₂ = M₄ + M₆, M₁₃ = M₄ + M₇, M₁₄ = M₄ + M₈, M₁₅ = M₄ + M₉, M₁₆ = M₄ + M₁₀.

3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block ; 16 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 6’ x 30’.
(v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Kapas yield. (iv) (a) and (b) Nil. (c) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
(i) 357 lb./ac.
(ii) (a) 105.4 lb./ac.
(b) 34.5 lb./ac.
(iii) Only main effect of N is significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>M₆</th>
<th>M₇</th>
<th>M₈</th>
<th>M₉</th>
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<th>M₁₃</th>
<th>M₁₄</th>
<th>M₁₅</th>
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<td>281</td>
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<td>304</td>
<td>330</td>
<td>301</td>
<td>314</td>
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<td>290</td>
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<td>286</td>
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<td>403</td>
<td>396</td>
<td>423</td>
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<td>387</td>
<td>424</td>
<td>407</td>
<td>380</td>
<td>410</td>
</tr>
<tr>
<td>Mean</td>
<td>336</td>
<td>359</td>
<td>361</td>
<td>367</td>
<td>349</td>
<td>369</td>
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<td>369</td>
<td>374</td>
<td>339</td>
<td>360</td>
<td>346</td>
<td>344</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. N marginal means = 18.6 lb./ac.
2. M marginal means = 17.3 lb./ac.
3. M means at the same level of N = 24.4 lb./ac.
4. N means at the same level of M = 30.1 lb./ac.
Crop: Cotton.  
Site: Institute of Plant Industry, Indore.  
Ref: M.P. 50(68).  
Type: 'M'.  

Object: To find out the effect of trace elements on the yield of Cotton.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS:**
   1. Control.
   2. Boron at 10 lb./ac.
   3. Copper at 20 lb./ac.
   4. Manganese at 20 lb./ac.
   5. Zinc at 20 lb./ac.
   6. Chromium at 20 lb./ac.

   The salts, powdered and mixed with earth were spread in plots and then thoroughly mixed with soil.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) to (e) N.A. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) and (ii) N.A. (iii) Kapas yield. (iv) (a) 1930—1931. (b) Yes. (c) —. (v) (a) and (b) N.A. (vi) Nil. (vii) Plot-wise yield data and analysis of variance not available. Experiment conducted under Cotton Physiological Scheme (I.C.C.C.)

5. **RESULTS:**
   (i) 547 lb./ac.
   (ii) 75 42 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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</tr>
<tr>
<td>2.</td>
<td>564</td>
</tr>
<tr>
<td>3.</td>
<td>553</td>
</tr>
<tr>
<td>4.</td>
<td>558</td>
</tr>
<tr>
<td>5.</td>
<td>551</td>
</tr>
<tr>
<td>6.</td>
<td>517</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=33.73 lb/ac.</td>
</tr>
</tbody>
</table>

---

Crop: Cotton.  
Site: Institute of Plant Industry, Indore.  
Ref: M.P. 51(88).  
Type: 'M'.  

Object: To find out the residual effect of trace elements on the yield of Cotton.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) Cotton. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS:**
   1. Control.
   2. Boron at 10 lb./ac.
   3. Copper at 20 lb./ac.
   4. Manganese at 20 lb./ac.
   5. Zinc at 20 lb./ac.
   6. Chromium at 20 lb./ac.

   The salts, powdered and mixed with earth were spread in plots and then thoroughly mixed with soil.

3. **DESIGN:**
   (i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 5. (iv) (a) N.A. (b) 6'x35'. (v) N.A. (vi) N.A.
4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Kapas yield.  (iv) (a) 1950—1951.  (b) Yes.  (c) —.  (v) (a) Nil.  (b) Nil.  (v) Nil.  (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
(i) 680 lb./ac.
(ii) 69.90 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of Kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>621</td>
</tr>
<tr>
<td>2.</td>
<td>726</td>
</tr>
<tr>
<td>3.</td>
<td>695</td>
</tr>
<tr>
<td>4.</td>
<td>706</td>
</tr>
<tr>
<td>5.</td>
<td>653</td>
</tr>
<tr>
<td>6.</td>
<td>678</td>
</tr>
</tbody>
</table>

S.E./mean = 31.26 lb./ac.

Crop:—Cotton.  
Site:—Institute of Plant Industry, Indore.  
Ref:—M.P. 49(64).  
Type:—’M’.

Object:—To find out the effect of trace elements with and without F.Y.M. on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil.  (b) and (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) N.A.  (iv) (a) to (c) N.A.  (v) N.A.  (vi) N.A.  (vii) Unirrigated.  (viii) to (x) N.A.

2. TREATMENTS:
Main-plot treatments:  
2 levels of N as F.Y.M.:  \( N_0 =0 \) and \( N_1 =20 \) lb./ac.
Sub-plot treatments:  
11 applications of trace elements: \( T_0 =\text{Control} \), \( T_1 =\text{Cu at 18 lb./ac.} \), \( T_2 =\text{Cu at 36 lb./ac.} \), \( T_3 =\text{Boron at 5 lb./ac.} \), \( T_4 =\text{Boron at 10 lb./ac.} \), \( T_5 =\text{Mn at 25 lb./ac.} \), \( T_6 =\text{Mn at 50 lb./ac.} \), \( T_7 =\text{Zn at 15 lb./ac.} \), \( T_8 =\text{Zn at 30 lb./ac.} \), \( T_9 =\text{Cr at 5 lb./ac.} \) and \( T_{10} =\text{Cr at 10 lb./ac.} \).

3. DESIGN:
(i) Split-plot.  (a) 2 main-plots/replication; 11 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) N.A.  (b) 3’×30’
(v) N.A.  (vi) Yes.

4. GENERAL:
(i) N.A.  (ii) N.A.  (iii) Kapas yield.  (iv) (a) 1949—1952.  (b), (c) No.  (v) (a) N.A.  (b) No.  (vi) Nil.
(vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
(i) 540 lb./ac.
(ii) 77.13 lb./ac.
(iii) 68.86 lb./ac.

(iii) \( N \) effect alone is highly significant.

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

<table>
<thead>
<tr>
<th></th>
<th>( T_0 )</th>
<th>( T_1 )</th>
<th>( T_2 )</th>
<th>( T_3 )</th>
<th>( T_4 )</th>
<th>( T_5 )</th>
<th>( T_6 )</th>
<th>( T_7 )</th>
<th>( T_8 )</th>
<th>( T_9 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( N_0 )</td>
<td>411</td>
<td>439</td>
<td>476</td>
<td>461</td>
<td>487</td>
<td>486</td>
<td>388</td>
<td>481</td>
<td>443</td>
<td>446</td>
<td>444</td>
</tr>
<tr>
<td>( N_1 )</td>
<td>574</td>
<td>649</td>
<td>663</td>
<td>652</td>
<td>588</td>
<td>629</td>
<td>592</td>
<td>610</td>
<td>622</td>
<td>659</td>
<td>680</td>
</tr>
<tr>
<td>Mean</td>
<td>492</td>
<td>544</td>
<td>572</td>
<td>556</td>
<td>537</td>
<td>538</td>
<td>490</td>
<td>546</td>
<td>533</td>
<td>553</td>
<td>561</td>
</tr>
<tr>
<td>S.E. of difference of two</td>
<td>1. N marginal means</td>
<td>=16.44 lb./ac.</td>
<td></td>
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<tr>
<td></td>
<td>2. T marginal means</td>
<td>=34.43 lb./ac.</td>
<td></td>
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<tr>
<td></td>
<td>3. T means at the same level of ( N )</td>
<td>=48.69 lb./ac.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>4. ( N ) means at the same level of T</td>
<td>=49.25 lb./ac.</td>
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</tbody>
</table>
Crop :- Cotton.  
Ref :- M.P 50(69).  
Site :- Institute of Plant Industry, Indore.  
Type :- 'M'.

Object :- To find out the residual effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) As per treatments.  
   (ii) (a) Black cotton soil. (b) N.A.  
   (iii) N.A.  
   (iv) (a) to (e) N.A.  
   (v) N.A.  
   (vi) N.A.  
   (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   1. Control.  
   2. Copper at 18 lb/ac.  
   3. Copper at 36 lb/ac.  
   4. Boron at 5 lb/ac.  
   5. Boron at 10 lb/ac.  

   Treatments applied in 1949 and residual effect studied in 1950.

3. DESIGN:
   (i) R.B.D.  
   (ii) 11.  
   (iii) 8.  
   (iv) (a) 6' x 30'.  
   (v) N.A.  
   (vi) N.A.

4. GENERAL:
   (i) N.A.  
   (ii) N.A.  
   (iii) Kapas yield.  
   (iv) (a) 1949—1952.  
   (b) Yes. (c) Nil.  
   (v) (a) Nil. (b) Nil. (c) N.I.  
   (vi) Nil. (vii) Original yield data and analysis of variance not available. Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
   (i) 177 lb/ac.  
   (ii) 39.08 lb/ac.  
   (iii) Treatment differences are not significant.  
   (iv) Av. yield of Kapas in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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<tr>
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<td>7.</td>
<td>184</td>
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<td>2.</td>
<td>182</td>
<td>8.</td>
<td>180</td>
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<tr>
<td>3.</td>
<td>173</td>
<td>9.</td>
<td>165</td>
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<tr>
<td>4.</td>
<td>183</td>
<td>10.</td>
<td>172</td>
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<td>5.</td>
<td>213</td>
<td>11.</td>
<td>160</td>
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<tr>
<td>6.</td>
<td>175</td>
<td>S.E./mean</td>
<td>13.82 lb/ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton.  
Ref :- M.P. 51(89).  
Site :- Institute of Plant Industry, Indore.  
Type :- 'M'.

Object :- To find out the residual effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Cotton. (c) As per treatments.  
   (ii) (a) Black cotton soil. (b) N.A.  
   (iii) N.A.  
   (iv) (a) to (e) N.A.  
   (v) N.A.  
   (vi) N.A.  
   (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   1. Control.  
   2. Copper at 18 lb/ac.  
   3. Copper at 36 lb/ac.  
   4. Boron at 5 lb/ac.  
   5. Boron at 10 lb/ac.  

   Treatments applied in 1949 and residual effect studied.

3. DESIGN:
   (i) R.B.D.  
   (ii) 11.  
   (iii) 8.  
   (iv) (a) N.A. (b) 6' x 30'. (v) N.A. (vi) N.A.
4. GENERAL:
(i) N.A. (ii) N.A. (iii) Kapar yield. (iv) (a) 1949—1952. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
(i) 569 lb./ac.
(ii) 55.97 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of kapar in lb./ac-

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
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<tr>
<td>2.</td>
<td>550</td>
<td>8.</td>
<td>556</td>
</tr>
<tr>
<td>3.</td>
<td>561</td>
<td>9.</td>
<td>574</td>
</tr>
<tr>
<td>4.</td>
<td>614</td>
<td>10.</td>
<td>571</td>
</tr>
<tr>
<td>5.</td>
<td>574</td>
<td>11.</td>
<td>574</td>
</tr>
<tr>
<td>6.</td>
<td>567</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td>=19.79 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton.  
Site :- Institute of Plant Industry, Indore.  
Ref :- M.P. 52(75).  
Type :- 'M'.  

Object :- To find out the residual effect of trace elements on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 18.6.1952. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
1. Control.  
2. Copper at 18 lb./ac.  
3. Copper at 36 lb./ac.  
4. Boron at 5 lb./ac.  
5. Boron at 10 lb./ac.  
6. Manganese at 25 lb./ac.  
Treatments applied in 1949 and its residual effect studied.

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 6'x32'. (v) and (vi) N.A.

4. GENERAL:
(i) and (ii) N.A. (iii) Kapar yield. (iv) (a) 1949—1952. (b) Yes. (c) Nil. (v) (a) N.A. (b) Nil. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
(i) 457 lb./ac.  
(ii) 54.55 lb./ac.  
(iii) Treatment differences are not significant.
(iv) Av. yield of kapar in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>442</td>
<td>7.</td>
<td>450</td>
</tr>
<tr>
<td>2.</td>
<td>464</td>
<td>8.</td>
<td>441</td>
</tr>
<tr>
<td>3.</td>
<td>487</td>
<td>9.</td>
<td>459</td>
</tr>
<tr>
<td>4.</td>
<td>455</td>
<td>10.</td>
<td>459</td>
</tr>
<tr>
<td>5.</td>
<td>447</td>
<td>11.</td>
<td>476</td>
</tr>
<tr>
<td>6.</td>
<td>446</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.E./mean</td>
<td></td>
<td></td>
<td>=19.29 lb./ac.</td>
</tr>
</tbody>
</table>
Crop: Cotton.  
Site: Institute of Plant Industry, Indore.  
Ref: M.P. 53(17).  
Type: ‘M’.

Object: To study the residual effect of organic and inorganic manures applied to preceding crops of Jowar, Tur and groundnut on the succeeding Cotton crop.

1. BASAL CONDITIONS:
   i) (a) No. (b) Jowar, tur and groundnut. (c) As per treatments.   
   ii) (a) Black cotton soil. (b) Drilled. (c) 10 lb./ac. (d) 14’ between rows. (e)—. (f) Nil.   
   iii) 4.7.1953. (iv) (a) One bakharing. (b) Drilled. (c) 10 lb./ac. (d) 14’ between rows. (e)—. (f) Nil.   

2. TREATMENTS:
   Main-plot treatments:
   3 previous crops: C1 = Groundnut, C2 = Jowar and C3 = Tur.
   Sub-plot treatments:
   All combinations of (1), (2) and (3)
   (1) 2 levels of N: N0 = 0 and N1 = 20 lb./ac.
   (2) 2 levels of P: P0 = 0 and P1 = 20 lb./ac.
   (3) 2 basal dressings: B0 = Nil and B1 = Farm compost.
   Manures applied to previous crops.

3. DESIGN:
   i) Split-plot. (ii) (a) 3 main-plots/block and 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 15’ x 14’. (b) 30’ x 9’-4”. (v) 2 rows on each side and 2’1 on each end. (vi) Yes.

4. GENERAL:
   i) Good. (ii) No. (iii) Yield of cotton. (iv) (a) 1952-1956. (b) Nc. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   i) 417 lb./ac.
   (ii) (a) 197.0 lb./ac.
   (b) 66.4 lb./ac.
   (iii) Main effect of C, P and B are highly significant. Others are not significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>Mean</th>
<th>B0</th>
<th>B1</th>
<th>F0</th>
<th>F1</th>
</tr>
</thead>
<tbody>
<tr>
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<td>346</td>
<td>376</td>
<td>416</td>
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<td>421</td>
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<td>417</td>
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<td>366</td>
<td>417</td>
<td>401</td>
<td>432</td>
<td>387</td>
<td>447</td>
</tr>
<tr>
<td>P0</td>
<td>503</td>
<td>326</td>
<td>320</td>
<td>383</td>
<td>369</td>
<td>397</td>
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<td>B0</td>
<td>519</td>
<td>336</td>
<td>348</td>
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<tr>
<td>B1</td>
<td>548</td>
<td>365</td>
<td>384</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. C marginal means  = 40.21 lb./ac.
2. N, P or B marginal means  = 11.07 lb./ac.
3. N, P or B means at the same level of C  = 19.18 lb./ac.
4. C means at the same level of N, P or B  = 42.43 lb./ac.
S.E. of body of N×P, N×B or P×B tables  = 11.07 lb./ac.
Crop :- Cotton  
Site :- Institute of Plant Industry, Indore.  
Ref:- M.P. 50(II).
Type :- 'M'.

Object :- To study the residual effect of P₂O₅ applied to the previous kharif crops, on Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) As per treatments.  (ii) (a) Black cotton soil. (b) N.A.  (iii) N.A.  (iv) (a) to (e) N.A.  (v) N.A.  (vi) N.A.  (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of P₂O₅ as Super : P₀=0, P₁=30 lb./ac.
   (2) 7 previous crops : C₁=Jowar No. B, C₂=Groundnut, C₃=Sann, C₄=Tard, C₅=Soybean, C₆=Cowpea and C₇=Gram.

3. DESIGN:
   (i) 2x7 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 55’×28’. (b) 50’×21’. (v) 2½’ on either side and 3½’ on each row. (vi) Yes.

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

5. RESULTS:
   (i) 757 lb./ac.
   (ii) 158.2 lb./ac.
   (iii) Effect of C and interaction C×P are highly significant. P effect is significant.
   (iv) Av. yield of kapas in lb./ac.

   |   | C₁ | C₂ | C₃ | C₄ | C₅ | C₆ | C₇ | Mean |
---|---|---|---|---|---|---|---|-----|
 P₀ | 1669 | 561 | 778 | 769 | 363 | 161 | 677 | 711 |
P₁ | 1604 | 608 | 948 | 938 | 502 | 225 | 790 | 802 |
 Mean | 1636 | 584 | 863 | 853 | 432 | 193 | 733 | 757 |

S.E. of marginal mean of C =55.94 lb./ac.
S.E. of marginal mean of P =29.90 lb./ac.
S.E. of body of table =79.11 lb./ac.

Crop :- Cotton.  
Site :- Institute of Plant Industry, Indore.  
Ref :- M.P. 49 (II).  
Type :- 'M'.

Object :- To study the residual effect of manures applied to Potato on the succeeding Cotton crop.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Potato. (c) As per treatments.  (ii) (a) Black cotton soil. (b) N.A.  (iii) 4.6.1949.  (iv) (a) Bakharing. (b) and (c) N.A. (d) 18’. (e) N.A. (v) N.A. (vi) Comadia Indore 1. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
   Main-plot treatments :
   Two times of planting potato in previous season : C₁=early and C₄=late planting.
   Sub-plot treatments :
   All combinations of (1), (2) and (3)
   (1) 2 levels of N as A/S : N₀=0 and N₁=40 lb./ac.
   (2) 2 levels of P₂O₅ as Super : P₀=0 and P₁=40 lb./ac.
   (3) 2 levels K₂O as Mono Pot. Phos. : K₀=0 and K₁=80 lb./ac.

Manures applied to previous crop potato.
3. DESIGN:
(i) Split-plot. (ii) (a) 2 main-plots/block; 8 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) 9' x 40' (b) 6' x 35'. (v) 2 rows on both sides and 2' of each row at both ends. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) Attack of Jassides and roller in July and August. (iii) Kapas yield. (iv) (a) < (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 686.3 lb./ac.
(ii) (a) 296.7 lb./ac. (b) 87.4 lb./ac.
(iii) Only N effect is highly significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>Mean</th>
<th>N0</th>
<th>N1</th>
<th>F0</th>
<th>P1</th>
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<td>724.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N0</td>
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<td>N1</td>
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<td>723.9</td>
<td>714.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two

1. C marginal means = 60.5 lb./ac.
2. N, P or K marginal means = 17.8 lb./ac.
3. N, P or K means at the same level of C = 25.2 lb./ac.
4. C means at the same levels of N, P or K = 38.4 lb./ac.
5. means in body of N x P, N x K or P x K table = 25.3 lb./ac.

Crop : Cotton (Kharif).
Site : Institute of Plant Industry, Indore.
Ref. : M.P. 52(5).
Type : 'M'.

Object : To find the relative efficiency of organic nitrogenous manures when applied alone and in combination with Super.

1. BASAL CONDITIONS:
(i) (a) Groundnut—cotton. (b) Groundnut. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.4.1952.
(iv) (a) 2 to 3 bakharings. (b) to (e) N.A. (v) Nil. (vi) Dhar 43 (Bhoj). (vii) Unirrigated. (viii) Nil.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 levels of P0 as Super : P0 = 0 and P1 = 30 lb./ac.
(2) 5 kinds of manures : M0 = no manure, M1 = "K" manure at 20 lb./ac., M2 = F.Y.M. at 20 lb./ac., M3 = F.C. at 20 lb./ac. of N and M4 = G.N.C. at 20 lb./ac. of N.

3. DESIGN:
(i) 2 x 5 Plct. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 6. (iv) (a) 60' x 11' 8". (b) 55' x 1'. (v) 2' on each side of the end. (vi) Yes.
4. **GENERAL:**
   (i) Good. (ii) Nil. (iii) *Kapas* yield. (iv) (a) 1932 to 1955. (b) No. (c) N.A. (v) (a) No. (b) N.A.
   (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 323.8 lb./ac.
   (ii) 51.30 lb./ac.
   (iii) Main effects of M and P are significant. Interaction is not significant.
   (iv) Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
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<td>330.2</td>
<td>293.4</td>
<td>335.8</td>
<td>302.2</td>
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<tr>
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<td>318.2</td>
<td>429.1</td>
<td>314.6</td>
<td>383.9</td>
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</tr>
<tr>
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<td>379.6</td>
<td>304.0</td>
<td>359.9</td>
<td>323.8</td>
</tr>
</tbody>
</table>

S.E. of M marginal means = 14.81 lb./ac.
S.E. of P marginal means = 9.40 lb./ac.
S.E. of body of table = 20.94 lb./ac.

---

**Crop**: Cotton.

**Site**: Institute of Plant Industry, Indore.

**Object**: To study the residual effect of manures, applied to previous *kharif* crops, on Cotton crop.

1. **BASAL CONDITIONS:**
   (i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 16, 17.6.1948. (iv) (a) to (e) N.A. (v) N.A. (vi) *Jarila*. (vii) N.A. (viii) Weeding and *duara*. (ix) and (a) N.A.

2. **TREATMENTS:**
   Main-plot treatments:
   - 3 previous crops: C₁=Groundnut, C₂=*Jowar* and C₃=*Tur*.

   Sub-plot treatments:
   - All combinations of (1) and (2)
     - (1) 3 levels of N as G.N.C.: N₀=0, N₁=20 and N₂=40 lb./ac.
     - (2) 3 levels of P₂O₅ Super.: P₀=0, P₁=20 and P₂=40 lb./ac.
   Manure applied to previous crops.

3. **DESIGN:**
   (i) Split-plot. (ii) (a) 3 main-plots/block, 9 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 24'4" × 10'. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) and (ii) N.A. (iii) No. of plants and *kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**
   (i) 321.7 lb./ac.
   (ii) 95.00 lb./ac.
   (b) 60.33 lb./ac.
   (iii) N and P effects are highly significant. Others are not significant.
(iv) Av. yield of \textit{kapas} in lb./ac.

<table>
<thead>
<tr>
<th>( N_0 )</th>
<th>( N_1 )</th>
<th>( N_2 )</th>
<th>( N_3 )</th>
<th>( P_0 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
</tr>
</thead>
<tbody>
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<td>275</td>
<td>272</td>
<td>319</td>
<td>328</td>
<td>277</td>
<td>283</td>
<td>305</td>
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<td>311</td>
<td>329</td>
<td>281</td>
<td>307</td>
<td>328</td>
<td>313</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. C marginal means
2. N or P marginal means
3. N or P means at the same level of C
4. C means at the same level of N or P
5. means in the body of N×P table

Crop :- Cotton.
Site :- Institute of Plant Industry, Indore.
Object :- To study the effect of N obtained from different sources and \( P_2 \) on Cotton yield.

1. BASAL CONDITIONS :
(i) (a) and (b) Jawar. (c) No. (ii) (a) Black cotton soil. (b) N.A. (iii) 21-7-1950. (iv) (a) to (c) N.A. (v) N.A.

2. TREATMENTS :
All combinations of (1), (2) and (3)
1. 4 levels of \( N \) : \( N_0 =0, N_1 =20, N_2 =40 \) and \( N_3 =60 \) lb./ac.
2. 3 sources of \( N \) : \( S_1 =\text{G.N.C.}, S_2 =\text{AIS} \) and \( S_3 =\text{C/N} \).
3. 3 levels of \( P_2 \) as Super : \( P_0 =0 \) and \( P_1 =30 \) lb./ac.

3. DESIGN :
(i) \( 2×3\times4 \) Fact. in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv) (a) 11'h'×70'. (b) 7'×65'. (v) 2'4' on either side and 2'2' on each end. (vi) Yes.

4. GENERAL :
(i) Good. (ii) No. (iii) \textit{Kapas} yield. (iv) (a) and (b) No. (c) N.A. (v) (a) No. (b) Nil. (vi) and (vii) Nil.

5. RESULTS :
(i) 288 lb./ac.
(ii) 61.45 lb./ac.
(iii) N and P effects are highly significant. S×P interaction is significant. Others are not significant.
(iv) Av. yield of \textit{kapas} in lb./ac.

\( N_0 P_0 =213 \) lb./ac. \( N_0 P_1 =239 \) lb./ac.
Crop: Cotton.
Site: Institute of Plant Industry, Indore.

Ref: M.P. 51(13).
Type: 'M'.

Object: To study the effect of N obtained from different sources and P₂O₅ on Cotton yield.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) Jowar. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 28.6.1951. (iv) (a) Bakharing and ploughing. (b) N.A. (c) 25 lb./ac. (d) 14'. (e) N.A. (v) Nil. (vi) Dhar-43. (vii) N.A. (viii) Thinning and weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 4 levels of N: N₀=0, N₁=20, N₂=40 and N₃=60 lb./ac.
(2) 3 sources of N: S₁=G.N.C., S₂=A/S and S₃=C/N.
(3) 2 levels of P₂O₅ as Super: P₀=0 and P₁=30 lb./ac.

3. DESIGN:
(i) 4 x 3 x 2 Fact. in R.B.D. (ii) (a) 24. (b) 100' x 168'. (iii) 3. (iv) (a) 50' x 14'. (b) 45' x 98'. (v) 2 rows on both sides and 2½' of each row at both ends. (vi) Yes.

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

5. RESULTS:
(i) 577 lb./ac.
(ii) 75.22 lb./ac.
(iii) N effect and interaction N x S are highly significant. S effect is significant. Others are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>N₂P₀=427 lb./ac.</th>
<th>N₂P₁=431 lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
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<td>N₁</td>
</tr>
<tr>
<td>P₀</td>
<td>583</td>
</tr>
<tr>
<td>P₁</td>
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</tr>
<tr>
<td>S₂</td>
<td>605</td>
</tr>
<tr>
<td>S₃</td>
<td>559</td>
</tr>
</tbody>
</table>

1. S.E. of N marginal mean excluding N₀ mean = 17.73 lb./ac.
2. S.E. of S marginal means = 17.73 lb./ac.
3. S.E. of P marginal means = 14.47 lb./ac.
4. S.E. of body of S x P or N x P table = 25.07 lb./ac.
5. S.E. of body of S x N table = 30.71 lb./ac.
6. S.E. of N₀P₀ or N₀P₁ mean = 25.07 lb./ac.
Crop: Cotton (Kharif).

Site: Institute of Plant Industry, Indore.

Object: To study the effect of N obtained from different sources and P₂O₅ on Cotton yield.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) Jowar (c) Nil (ii) (a) Black cotton soil (b) N.A. (iii) 26.6.1951. (iv) (a) Bakharing (b) N.A. (c) 25 lb/ac. (d) 14". (e) N.A. (v) N.A. (vi) Dhar 43. (vii) N.A. (viii) Thinning and weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:

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

1. Basal Conditions:

(i) 4 levels of N: N₀=0, N₁=20, N₂=40 and N₃=60 lb/ac.

2. Sources of N: S₁=G.N.C., S₂=1/4 and S₃=C/N.

3. 2 levels of P₂O₅ as Super: P₀=0 and P₁=10 lb/ac.

3. DESIGN:

(i) 4x3x2 Fact. in R.B.D. (ii) 24. (b) 70'x68'. (iii) 3. (iv) (a) 35'x14'. (b) 30'x9'1'. (v) Two rows on both sides and 2' of each row at both ends. (vi) Yes.

4. GENERAL:


5. RESULTS:

(i) N₀P₀=263 lb/ac. N₀P₁=441 lb/ac.

<table>
<thead>
<tr>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
</tr>
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<tbody>
<tr>
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<td>760</td>
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<td>549</td>
<td>618</td>
<td>647</td>
</tr>
<tr>
<td>470</td>
<td>613</td>
<td>807</td>
<td>633</td>
<td>503</td>
<td>676</td>
<td>620</td>
</tr>
<tr>
<td>Mean</td>
<td>477</td>
<td>591</td>
<td>788</td>
<td>619</td>
<td>576</td>
<td>647</td>
</tr>
<tr>
<td>S₁</td>
<td>463</td>
<td>587</td>
<td>677</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>S₂</td>
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<td>600</td>
<td>823</td>
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<td></td>
</tr>
<tr>
<td>S₃</td>
<td>450</td>
<td>585</td>
<td>865</td>
<td></td>
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</table>

S.E. of N marginal means excluding N₀ = 23.70 lb/ac.
S.E. of S marginal means = 23.70 lb/ac.
S.E. of P marginal means = 16.76 lb/ac.
S.E. of body of S x P or N x S tables = 33.52 lb/ac.
S.E. of body of N x S table = 41.06 lb/ac.
S.E. of N₀P₀ or N₀P₁ mean = 33.52 lb/ac.


Ref: M.P. 51(14).

Object: To study the effect of N obtained from different sources and P₂O₅ on Cotton yield.

1. BASAL CONDITIONS:

(i) (a) No. (b) Tur. (c) Nil (ii) (a) Black cotton soil (b) N.A. (iii) 4.7.1953. (iv) (a) Bakharing (b) Drilling. (c) lb/ac. (d) 14" between rows. (e) —. (f) Nil. (v) Dhar 43. (vi) Unirrigated. (vii) Hand weeding followed by interculture with daura. (ix) 32.53'. (x) 3 pickings on 20.11.1953, 19.12.1953 and 12.1.1954.
2. TREATMENTS:

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

(1) 3 levels of N: N_0 = 0, N_1 = 20 and N_2 = 40 lb./ac.
(2) 4 sources of N: S_1 = K manure, S_2 = FYM, S_3 = Farm Compost and S_4 = GNC.
(3) 2 levels of P_2O_5 as Super: P_0 = 0, and P_1 = 30 lb./ac.

3. DESIGN:

(i) 4 x 3 x 2 Fact in R.B.D. (ii) (a) 24. (b) N.A. (iii) 3. (iv) (a) 45' x 14' (b) 40' x 9'. (v) 2 rows on each side and 24 on each end. (vi) Yes.

4 GENERAL:

(i) Good. (ii) N.A. (iii) Kupas yield. (iv) (a) 1952 to 1955. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 711 lb./ac.
(ii) 119.4 lb./ac.
(iii) N and S effects are highly significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S_1</th>
<th>S_2</th>
<th>S_3</th>
<th>S_4</th>
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<th>P_0</th>
<th>P_1</th>
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<td>637</td>
<td>665</td>
<td>768</td>
<td>757</td>
<td>704</td>
<td>667</td>
<td>741</td>
</tr>
<tr>
<td>N_2</td>
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<td>931</td>
<td>791</td>
<td>749</td>
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<td>802</td>
<td>844</td>
<td>748</td>
<td>708</td>
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<td>633</td>
<td>611</td>
<td>775</td>
<td>792</td>
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<tr>
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<td>744</td>
<td>829</td>
<td>896</td>
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</tbody>
</table>

S.E. of marginal mean of N = 24.4 lb./ac.
S.E. of marginal mean of P = 19.9 lb./ac.
S.E. of body of N x P table = 34.5 lb./ac.
S.E. of body of S x N or S x P table = 48.7 lb./ac.
S.E. of N x P or P x N mean = 34.5 lb./ac.

Crop : Cotton.
Site : Institute of Plant Industry, Indore.
Object : To study the effect of P_2O_5 applied to leguminous crops on the succeeding Cotton crop, with and without N.

1. BASAL CONDITIONS:

(i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Bakarering. (b) and (c) N.A. (d) 14'. (e) N.A. (v) to (vii) N.A. (viii) Weeding and thinning. (ix) and (x) N.A.

2. TREATMENTS:

Main-plot treatments:

7 leguminous crops: C_1 = Tur, C_2 = Soyabean, C_3 = Gram, C_4 = Sann, C_5 = Groundnut, C_6 = Jowar and C_7 = Pea.

(2) 2 levels of P_2O_5: P_0 = 0 and P_1 = 30 lb./ac.

Sub-plot treatments:

2 levels of N: N_0 = 0 and N_2 = 20 lb./ac. applied to cotton.

3. DESIGN:

(i) Split-plot. (ii) (a) 14 main-plots/block, 2 sub-plot/main-plot. (b) N.A. (iii) 4. (iv) (a) 14' x 69'. (b) 9' x 64'. (v) Two rows on both sides and 24' of each row at both ends. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A. (iii) Stand of the crop and kapas yield. (iv) (a) 1947—N.A. (plot size changed in 1948), (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 450.2 lb./ac.
(ii) (a) 102.4 lb./ac.
(b) 48.47 lb./ac.

(iii) C effect is significant. Others are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
<th>Mean</th>
<th>P3</th>
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<td>391.0</td>
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<td>428.6</td>
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<td>519.7</td>
<td>541.9</td>
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<td>427.4</td>
<td>509.3</td>
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</tr>
<tr>
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<td>466.1</td>
<td>461.3</td>
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<td>417.4</td>
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<td>.977.</td>
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<td>374.4</td>
<td>483.5</td>
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</tbody>
</table>

S.E. of difference of two
1. C marginal means = 36.20 lb./ac.
2. P marginal means = 13.35 lb./ac.
3. N marginal means = 9.16 lb./ac.
4. N means at a level of C = 21.3 lb./ac.
5. N means at a level of P = 2.95 lb./ac.
6. C means at s level of N = 49.0 lb./ac.
7. P means at a level of N = 21.36 lb./ac.

Crop := Cotton.
Site := Institute of Plant Industry, Indore.
Ref := M.P. 49(28).
Type := 'M'.

Object := To study the effect of P2O5 applied to leguminous crops on the succeeding cotton crop, with and without N.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.7.1949. (iv) (a) to (c) N.A. (d) 14’. (e) N.A. (v) N.A. (vi) Maiti dhar 43. (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   All combinations of (1) and (2)
   (1) 7 leguminous crops: C1 = Jowar, C2 = Groundnut, C3 = Sann, C4 = Tur, C5 = Soyabean, C6 = Cowpea, and C7 = Gram.
   (2) 2 levels of P2O5 as Super: P0 = 0 and P1 = 30 lb./ac.
   Sub-plot treatments:
   2 levels of N as A/S: N0 = 0 and N1 = 30 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 14 main-plots/block 2 sub-plots/main-plot. (b) N.A. (iii) 4. (iv) (a) 14’ x 70’, (b) 9’4” x 65”. (v) Two rows on both sides and 21’ of each row at both ends. (vi) Yes

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

5. RESULTS:
   (i) 263.9 lb./ac.
   (ii) (a) 61.06 lb./ac.
   (b) 23.57 lb./ac.
Main effects of C, P and N are highly significant. Other effects are not significant.

Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C_1</th>
<th>C_2</th>
<th>C_3</th>
<th>C_4</th>
<th>C_5</th>
<th>C_6</th>
<th>C_7</th>
<th>Mean</th>
<th>P_0</th>
<th>P_1</th>
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<td>N_0</td>
<td>214.9</td>
<td>249.2</td>
<td>242.4</td>
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<td>167.2</td>
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<td>191.5</td>
<td>258.4</td>
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<tr>
<td>N_1</td>
<td>305.2</td>
<td>326.6</td>
<td>312.6</td>
<td>286.8</td>
<td>330.0</td>
<td>282.6</td>
<td>240.7</td>
<td>297.8</td>
<td>257.1</td>
<td>338.4</td>
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<tr>
<td>Mean</td>
<td>260.0</td>
<td>257.9</td>
<td>277.5</td>
<td>255.0</td>
<td>293.1</td>
<td>269.5</td>
<td>204.0</td>
<td>263.9</td>
<td>224.3</td>
<td>303.4</td>
</tr>
</tbody>
</table>

S.E. of difference of two

2. P marginal means = 11.54 lb./ac.
3. N marginal means = 4.45 lb./ac.
4. N means at the same level of C = 11.79 lb./ac.
5. N means at the same level of P = 6.30 lb./ac.
6. C means at the same level of N = 23.14 lb./ac.
7. P means at the same level of N = 12.37 lb./ac.
8. means in the body of C x P table = 30.53 lb./ac.

**Crop:** Cotton (*Kharif*).

**Site:** Institute of Plant Industry, Indore.

**Ref:** M.P. 51(11).

**Type:** 'M'.

Object: To study the effect of P_2 O_5 applied to leguminous crops on the succeeding Cotton crop with and without N.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) 29.6.1951. (iv) (a) and (b) N.A. (c) 25 lb./ac. (d) 14". (e) N.A. (v) Nil. (vi) and (vii) N.A. (viii) Weeding. (ix) and (x) N.A.

2. TREATMENTS:
   **Main-plot treatments:**
   All combinations of (1) and (2).
   (2) 2 levels of P_2 O_5 as Super: P_0 = 0 and P_1 = 30 lb./ac.

   **Sub-plot treatments:**
   2 levels of N as G.N.C.: N_0 = 0 and N_1 = 30 lb./ac.

3. DESIGN:
   (i) Split-plot. (ii) (a) 14 main-plots/block and 2 sub-plots/main-plot. (b) 192" x 110". (iii) 4. (iv) (a) Main-plot 28" x 55" and sub-plot: 14" x 55". (b) 94" x 50". (v) Two rows on both sides and 2' of each row at both sides. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) *Kapas* yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 589.0 lb./ac.
   (ii) (a) 155.9 lb./ac.
   (b) 95.2 lb./ac.
   (iii) Only main effect of C is highly significant.
(iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
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<tr>
<td>N1</td>
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<td>736.8</td>
<td>633.8</td>
<td>649.2</td>
<td>692.3</td>
<td>741.9</td>
<td>640.5</td>
<td>659.8</td>
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<td>665.5</td>
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<td>659.4</td>
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<td>578.8</td>
<td>633.2</td>
<td>661.2</td>
<td>572.3</td>
<td>589.0</td>
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</tbody>
</table>

S.E. of difference of two
1. C marginal means = 55.12 lb/ac.
2. P marginal means = 29.46 lb/ac.
4. N means at the same level of C = 47.60 lb/ac.
5. N means at the same level of P = 25.44 lb/ac.
6. C means at the same level of N = 64.51 lb/ac.
7. P means at the same level of N = 34.52 lb/ac.
8. Means in the body of C x P table = 77.93 lb/ac.

Crop: Cotton. Ref: M.P. 52(15).
Site: Institute of Plant Industry, Indore. Type: ‘M’.

Object: To study the effect of P2O5 applied to leguminous crops on the succeeding cotton crop, with and without N.

1. BASAL CONDITIONS:
   (i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 22.6.1952. (v) (a) Ploughing. (b) to (e) N.A. (v) N.A. (vi) Dhar-43 (bhoi). (vii) Unirrigated. (viii) 2 weedings. (ix) 25.5°. (x) 7 pickings on 29.10.1952, 3.11.1952, 7.11.1952, 8.11.1952, 1-12.1952 and 12.1.1953.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
(1) 7 leguminous crops: C1 = Jowar, C2 = Groundnut, C3 = Cowpea, C4 = Sann, C5 = Tur, C6 = Soyabean and C7 = Gram.
(2) 2 levels of N as A/S: N0 = 0 and N1 = 30 lb/ac.
(3) 2 levels of P2O5 as Super: P0 = 0 and P1 = 30 lb/ac.

3. DESIGN:
   (i) 7 x 2 x 2 Fact. in R.B.D. (ii) (a) 28. (b) N.A. (iii) 4. (iv) (a) 11'8" x 75'. (b) 7' x 70'. (v) 24'. (vi) Yca.

4. GENERAL:
   (i) Good. (ii) Nil. (iii) Kapas yield. (iv) (a) 1947-1952. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 315 lb/ac.
   (ii) 61.17 lb/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C7</th>
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<th>Pb</th>
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<td>282</td>
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<tr>
<td>P1</td>
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<td>325</td>
<td>313</td>
<td>322</td>
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</tbody>
</table>
Crop: Cotton.
Site: Institute of Plant Industry, Indore.

Object: To study the effect of N and P on the yield of Cotton.

1. BASAL CONDITIONS:
(a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 20.6.1948., resowing on 3.7.1948. (iv) (a) and (b) N.A. (c) 30 lb./ac. (d) and (e) N.A. (v) N.A. (vi) l.ortila. (vii) A. (viii) Weeding and gap filling. (ix) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 5 levels of N: N₀=0, N₁=20, N₂=40, N₃=60 and N₄=80 lb./ac.
(2) 2 sources of N: S₁=G.N.C. and S₂=A/S.
(3) 2 levels of P₀₀ as Bone Char: P₀=0 and P₁=40 lb./ac.

3. DESIGN:
(i) 5 x 2 x 2 Factual in R.B.D. (ii) 20. (b) N.A. (iii) 3. (iv) (a) 11° x 66°. (b) 7° x 55°. (v) Two rows on both sides and 2' of each row at both ends. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Kapas yield. (iv) (a) to (c) N.A. (v) (a), (b) N.A. (vi) Nil.

5. RESULTS:
(i) 221.4 lb./ac.
(ii) 57.2 lb./ac.
(iii) Control v. treated and effect of S are highly significant. Others are not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀ P₀=170.8 lb./ac.</th>
<th>N₀ P₁=173.2 lb./ac.</th>
<th>Mean</th>
<th>P₀</th>
<th>P₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>N₁</td>
<td>237.2</td>
<td>232.5</td>
<td>325.7</td>
<td>239.5</td>
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</tr>
<tr>
<td>N₂</td>
<td>210.0</td>
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<td>201.8</td>
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<td></td>
</tr>
<tr>
<td>Mean</td>
<td>223.6</td>
<td>212.4</td>
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<td>216.6</td>
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</tr>
<tr>
<td>P₀</td>
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<tr>
<td>P₁</td>
<td>220.7</td>
<td>220.7</td>
<td>278.5</td>
<td>264.3</td>
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</tr>
</tbody>
</table>

S.E. of N marginal means = 16.69 lb./ac.
S.E. of S or P marginal means = 11.81 lb./ac.
S.E. body of N x S or N x P table = 2 x 1 lb./ac.
S.E. body of S x P table = 1 x 69 lb./ac.
2. TREATMENTS:

All combinations of (1), (2) and (3)
(1) 5 levels of N: \( N_0 = 0, N_1 = 20, N_2 = 40, N_3 = 60 \) and \( N_4 = 80 \) lb./ac.
(2) 2 sources of N: \( S_1 = \text{G.N.C.} \) and \( S_2 = \text{A/S} \).
(3) 2 levels of \( P_2O_5 \) as Super: \( P_0 = 0 \) and \( P_1 = 40 \) lb./ac.

3. DESIGN:

(i) \( 5 \times 2 \times 2 \) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) \( 10' \times 70' \). (b) \( 5' \times 65' \). (v) 2 rows on both the sides and 2' of each row at both ends (vi) Y.s.

4. GENERAL:

(i) Not good. Heavy shedding due to heavy rains in Oct. and Nov. 1949. (ii) N.A. (iii) Kapas yield. iv' (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 436.0 lb./ac.
(ii) 32.60 lb./ac.
(iii) All the effect are highly significant.
(iv) Av. yield of kapas in lb./ac.

\[
\begin{array}{cccc|cc}
& N_1 & N_2 & N_3 & N_4 & \text{Mean} & P_0 & P_1 \\
S_1 & 398.7 & 429.9 & 489.7 & 433.5 & 437.9 & 387.4 & 488.5 \\
S_2 & 391.6 & 409.5 & 508.9 & 564.0 & 468.5 & 453.2 & 483.7 \\
\text{Mean} & 395.1 & 419.7 & 499.3 & 498.7 & 453.2 & 420.1 & 488.1 \\
\end{array}
\]

\[
\begin{array}{c}
P_0 = 385.6 \\
P_1 = 404.7
\end{array}
\]

S.E. of N marginal means = 9.40 lb./ac.
S.E. of S or P marginal means = 6.60 lb./ac.
S.E. of body N x S or N x P tables = 13.28 lb./ac.
S.E. of body of S x P table = 9.40 lb./ac.

\[\text{S.E. of body of N x S x P table} = \text{S.E. of body of S x P table}\]

Crop: Cotton,
Site: Institute of Plant Industry, Indore.
Object: To study the effect of N and \( P_2O_5 \) on the yield of Cotton.

Ref: M.P. 48(4).
Type: 'M'.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 26.6.1948. (iv) (a) and (b) N.A. (c) 30 lb./ac.
(d) 14'. (e) N.A. (v) N.A. (vi) Dhar 43. (vii) N.A. (viii) Dawa and weeding. (ix) N.A. (x) N.A.

2. TREATMENTS:

All combinations of (1), (2) and (3)
(1) 5 levels of N: \( N_0 = 0, N_1 = 20, N_2 = 40, N_3 = 60 \) and \( N_4 = 80 \) lb./ac.
(2) 2 sources of N: \( S_1 = \text{G.N.C.} \) and \( S_2 = \text{A/S} \).
(3) 2 levels of \( P_2O_5 \) as Bone Char: \( P_0 = 0 \) and \( P_1 = 40 \) lb./ac.

3. DESIGN:

(i) \( 5 \times 2 \times 2 \) Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) \( 11' \times 60' \). (b) \( 7' \times 50' \). (v) 2 rows on both sides and 2' of each row at both sides (vi) Y.s.
4. GENERAL:
(i) N.A. (ii) N.A. (iii) Stand of the crop and weight *Kapar*. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 362.0 lb./ac.
(ii) 98.77 lb./ac.
(iii) Only S effect and control vs treated are highly significant.
(iv) Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>Mean</th>
<th>P₀</th>
<th>P₁</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>405.9</td>
<td>442.5</td>
<td>499.1</td>
<td>505.0</td>
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<td>433.1</td>
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<td>416.5</td>
<td>401.2</td>
<td>394.1</td>
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</table>

S.E. of N marginal means = 28.56 lb./ac.
S.E. of S or P marginal means = 20.15 lb./ac.
S.E. of body of N×S or N×P tables = 40.37 lb./ac.
S.E. of body of S×P table = 28.56 lb./ac.

Crop: Cotton.  
Site: Institute of Plant Industry, Indore.  
Object: To study the effect of N and P₂O₅ on the yield of Cotton.

Ref: M.P. 49(21).  
Type: 'M'.

1. BASAL CONDITIONS:
(i) (a) N.A. (b) N.A. (c) N.A. (ii) Black cotton soil. (b) N.A. (iii) 1,2,7,1949. (iv) (a) to (c) N.A. (d) 14". (e) N.A. (v) N.A. (vi) Dhar 43 Malvi. (vii) N.A. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3)
(1) 5 levels of N: N₀ =0, N₁ =20, N₂ =40, N₃ =60 and N₄ =80 lb./ac.
(2) 2 sources of N: S₁ =G.N.C. and S₂ =A/S.
(3) 2 levels of P₂O₅ as Super: P₀ =0 and P₁ =40 lb./ac.
A/S and G.N.C. broadcast while Super drilled.

3. DESIGN:
(i) 5×2×2 Fact. in R.B.D. (ii) (a) 20. (b) N.A. (iii) 3. (iv) (a) 10° 6′×70°. (b) 5° 10′×65°. (v) 2 rows on both sides and 2½ of each row at both ends. (vi) Yes.

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

5. RESULTS:
(i) 754.5 lb./ac.
(ii) 172.7 lb./ac.
(iii) Control vs treated effect is highly significant, N effect is significant. Other effects are not significant.
(iv) Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N&lt;sub&gt;1&lt;/sub&gt;</th>
<th>N&lt;sub&gt;2&lt;/sub&gt;</th>
<th>N&lt;sub&gt;3&lt;/sub&gt;</th>
<th>N&lt;sub&gt;4&lt;/sub&gt;</th>
<th>Mean</th>
<th>P&lt;sub&gt;E&lt;/sub&gt;</th>
<th>P&lt;sub&gt;P&lt;/sub&gt;</th>
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<td>898.0</td>
<td>805.1</td>
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<td>917.2</td>
<td>953.1</td>
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</tbody>
</table>

S.E. of N marginal means = 49.83 lb./ac.
S.E. of S or P marginal means = 35.26 lb./ac.
S.E. of body of N x S or N x P tables = 70.51 lb./ac.
S.E. of body of S x P table = 49.83 lb./ac.

Crop :- Cotton.
Site :- Govt. Farm, Khandwa.

Object :- To study the effect of different manures on the yield of Cotton.

1. BASAL CONDITIONS :
(i) (a) Groundnut—Cotton—Jowar. (b) Jowar. (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A.
(ii) 30.6.1951. (iv) (a) Bakharing. (b) Sown with riffin. (c) to (e) N.A. (v) N.A. (vi) H. 420 (medium).

2. TREATMENTS :
1. Control.
2. Oil cake at 20 lb./ac. of N.
3. A/S at 20 lb./ac. of N.
4. Decorticated cake at 20 lb./ac. of N.
5. Undecorticated cake at 20 lb./ac. of N.
Manures applied just before sowing.

3. DESIGN :
(i) L. Sq. (ii) (a) 5. (b) N.A. (iii) 5. (iv) (a) 34' x 34'. (b) 33' x 33'. (v) N.A. (vi) Yes.

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

5. RESULTS :
(i) 409.2 lb./ac.
(ii) 72.72 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>364.0</td>
</tr>
<tr>
<td>2.</td>
<td>432.0</td>
</tr>
<tr>
<td>3.</td>
<td>480.0</td>
</tr>
<tr>
<td>4.</td>
<td>398.0</td>
</tr>
<tr>
<td>5.</td>
<td>572.0</td>
</tr>
</tbody>
</table>

S.E./mean = 32.48 lb./ac.
Crop: Cotton. Site: Govt. Farm, Khandwa. Ref: M.P. 50(54). Type: 'M'.


1. BASAL CONDITIONS:

2. TREATMENTS:
   1. Control.
   2. F.Y.M. at 50 C.L./ac.
   3. G.N.C. at 7 md./ac.
   4. A/S at 50 lb./ac. of N.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) 282'x66'. (iii) 4. (iv) (a) and (b) 66'x33'. (v) Nil. (vi) No.

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

5. RESULTS:
   (i) 688.6 lb./ac.
   (ii) 64.60 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
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<td>5.</td>
<td>945.0</td>
</tr>
<tr>
<td>2.</td>
<td>447.5</td>
<td>6.</td>
<td>620.0</td>
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<tr>
<td>3.</td>
<td>512.5</td>
<td>7.</td>
<td>857.5</td>
</tr>
<tr>
<td>4.</td>
<td>711.3</td>
<td>8.</td>
<td>1057.5</td>
</tr>
</tbody>
</table>

S.E./mean = 32.30 lb./ac.

Crop: Cotton. Site: Govt. Farm, Khandwa. Ref: M.P. 53(25). Type: 'M'.

Object: To compare the effect of different sources of N on Cotton.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Jowar. (c) N.A. (ii) (a) Medium black cotton. (b) N.A. (iii) 30.6.1953. (iv) (a) Bakharimg and hoeing. (b) Sown by tiffin. (c) 16 lb./ac. (d) Between rows—18" and between plants—9". (e) N.A. (vi) and (vi) N.A. (vii) Unirrigated. (viii) Weeding. (ix) 32.30'. (x) N.A.

2. TREATMENTS:
   1. Control.
   2. A/S at 20 lb./ac. of N.
   3. A/S at 40 lb./ac. of N.
   4. A/S at 60 lb./ac. of N.

3. DESIGN:
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 5. (iv) (a) 1/36 ac. (b) 33'x33'. (v) N.A. (vi) Yes.

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

5. RESULTS:
   (i) 422.9 lb./ac.
   (ii) 94.00 lb./ac.
   (iii) Treatments differ highly significantly.
Crop: Cotton (Kharif).
Site: Institute of Plant Industry, Indore.

Object: To find out suitable variety and manurial schedule for Cotton.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) and (c) N.A.  (ii) (a) Black cotton soil. (b) N.A.  (iii) N.A.  (iv) (a) to (c) N.A.  (v) N.A.  (vi) As per treatments. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   Main-plot treatments:
   Two varieties: V1=Indore 1 and V2=Burl-107.

   Sub-plot treatments:
   3 levels of P2O5: P0=0, P1=25 and P2=50 lb./ac.

   Sub-sub-plot treatments:
   6 levels of N: N0=0, N1=20, N2=40, N3=60, N4=80 and N5=100 lb./ac.

3. DESIGN:
   (i) Split-split-plt.  (ii) (a) 2 main-plots/block, 3 sub-plots/main-plot and 6 sub-sub-plots/sub-plot.  (b) N.A.  (iii) 2.  (iv) (a) N.A.  (b) 3'×30'.  (v) N.A.  (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A.  (iii) Kapas yield.  (iv) (a) No.  (v) and (c) N.A.  (v) (a) and (b) N.A.  (vi) Nil.  (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
   (i) 779 lb./ac.
   (ii) (a) 37.4 lb./ac.
   (b) 100.7 lb./ac.
   (c) 87.4 lb./ac.
   (iii) Main effect of N alone is highly significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N0</th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
<th>N5</th>
<th>Mean</th>
<th>P0</th>
<th>P1</th>
<th>P2</th>
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<td>841</td>
<td>739</td>
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<td>686</td>
<td>761</td>
<td>901</td>
<td>925</td>
<td>945</td>
<td>779</td>
<td>734</td>
<td>798</td>
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<tr>
<td>P0</td>
<td>464</td>
<td>641</td>
<td>689</td>
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<td>866</td>
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<td>444</td>
<td>732</td>
<td>797</td>
<td>915</td>
<td>941</td>
<td>1012</td>
<td></td>
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</table>

S.E. of difference of two
1. V marginal means = 8.82 lb./ac.  5. V means at the same level of P = 34.71 lb./ac.
2. P marginal means = 29.07 lb./ac.  6. N means at the same level of V = 50.48 lb./ac.
3. N marginal means = 35.69 lb./ac.  7. V means at the same level of N = 46.92 lb./ac.
4. P means at the same level of V = 41.11 lb./ac.  8. N means at the same level of P = 61.82 lb./ac.
9. P means at the same level of N = 63.49 lb./ac.
Crop: Cotton ('Kharif').

Site: Institute of Plant Industry, Indore.

Object: To find out suitable variety and manurial schedule for Cotton.

1. **BASAL CONDITIONS:**
   (i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) to (x) N.A.

2. **TREATMENTS:**
   **Main-plot treatments:**
   2 varieties: V₁ = American and V₂ = Desi.
   **Sub-plot treatments:**
   All combinations of (1), (2) and (3)
   (1) 4 levels of N: N₀ = 0, N₁ = 25, N₂ = 50 and N₃ = 75 lb./ac.
   (2) 3 levels of P₂O₅: P₀ = 0, P₁ = 25 and P₂ = 50 lb./ac.
   (3) 3 levels of K₂O: K₀ = 0, K₁ = 50 and K₂ = 100 lb./ac.

3. **DESIGN:**
   (i) Split-plot. (ii) (a) 2 main-plots/block; 36 sub-plots/main-plot. (b) N.A. (iii) 2. (iv) (a) N.A. (b) 6' x 30'. (v) N.A. (vi) Yes.

4. **GENERAL:**
   (i) N.A. (ii) N.A. (iii) Kapas yield. (iv) (a) No. (b) and (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS:**

<table>
<thead>
<tr>
<th>V₁</th>
<th>V₂</th>
<th>Mean</th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>P₀</th>
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<td>708</td>
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<td>Mean</td>
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<td>429</td>
<td>615</td>
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<td>797</td>
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<td>663</td>
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<td>N₃</td>
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<td>631</td>
<td>797</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. V marginal means = 10.91 lb./ac.
2. N marginal means = 15.74 lb./ac.
3. P or K marginal means = 13.63 lb./ac.
4. N means at the same level of V = 22.25 lb./ac.
5. V means at the same level of N = 22.15 lb./ac.
6. P or K means at the same level of V = 19.27 lb./ac.
7. V means at the same level of P or K = 19.15 lb./ac.
8. means in body of P x K table = 23.60 lb./ac.
9. means in body of N x P or N x K table = 27.26 lb./ac.
Crop :- Cotton (Kharif).
Site :- Institute of Plant Industry, Indore.

Object :- To study the effect of treating Cotton seed before sowing with different nutrient solutions.

1. BASAL CONDITIONS :
(i) (a) to (e) N.A.  (ii) (a) Black cotton soil. (b) N.A. (iii) 5.7.1949. (iv) (a) Bakharing. (b) and (c) N.A. (d) N.A. (e) N.A.  (vi) As per treatments. (vii) N.A. (viii) Weeding. (ix) N.A.  (x) N.A.

2. TREATMENTS :
All combinations of (1) and (2).
(1) 2 varieties : V₁ = Malvi Dhar 43 and V₂ = Combodia Indore.

3. DESIGN :
(i) 2 x 5 Fact. in R.B.D. (ii) (a) N.A. (iii) 4'. (iv) (a) 9' 4" x 60'. (b) 4' 8" x 55'. (v) Two rows on both sides and 2½ feet of each row at both ends. (vi) Yes.

4. GENERAL :
(i) N.A. (ii) N.A. (iii) Kapas yield. (iv) (a) to (c) N.A. (v) (a) N.A. (vi) and (vii) Nil.

5. RESULTS :
(i) 303.3 lb./ac.  (ii) 40.1 lb./ac.  (iii) V and S effects are highly significant. Interaction is not significant.
(iv) Av. yield of Kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
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<td>161.4</td>
<td>201.5</td>
<td>291.7</td>
<td>262.5</td>
<td>262.5</td>
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<tr>
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<td>285.4</td>
<td>350.0</td>
<td>342.0</td>
<td>314.2</td>
<td>303.3</td>
</tr>
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</table>

S.E. of S marginal means = 14.42 lb./ac.
S.E. of V marginal means = 8.90 lb./ac.
S.E. of body of table = 20.00 lb./ac.

Crop :- Cotton.
Site :- Institute of Plant Industry, Indore.

Object :-To study the effect of soaking cotton seed in nutrient solutions before sowing on the yield of Cotton.

1. BASAL CONDITIONS :
(i) (a) No.  (b) Jawar. (c) N.A.  (ii) (a) Black cotton soil. (b) N.A. (iii) 12.7.1950. (iv) (a) to (c) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) and (ix) N.A. (x) 3 pickings on 6.12.1950, 12.1.1951 and 11.4.1951.

2. TREATMENTS :
All combinations of (1) and (2).
(1) 2 varieties : V₁ = Malvi Dhar 43 and V₂ = Combodia Indore 1.

3. DESIGN :
(i) 2 x 5 Fact. in R.B.D. (ii) (a) 10. (b) N.A. (iii) 4. (iv) (a) 9'8" x 60'. (b) 4'8" x 55'. (v) Two rows on each side. (vi) Yes.

4. GENERAL :
(i) Good. (ii) Nil. (iii) Kapas yield. (iv) (a) N.A. (b) No. (c) N.A. (v) (a)1/2 No.  (b) N.A. (vi) and (vii) Nil.
5. RESULTS:
(i) 277.1 lb./ac.
(ii) 37.10 lb./ac.
(iii) S and V effects are highly significant. Interaction is not significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
<th>S₄</th>
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<tr>
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<td>292.5</td>
<td>283.4</td>
<td>296.4</td>
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</table>

S.E. of S marginal means = 8.3 lb./ac.
S.E. of V marginal means = 13.12 lb./ac.
S.E. of body of table = 18.55 lb./ac.

Crop: Cotton.
Site: Institute of Plant Industry, Indore.
Object: To study the effect of soaking cotton seed in nutrient solutions on the yield of Cotton.
Ref: M.P. 52(12).
Type: ‘MV’.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) Black cotton soil. (b) N.A. (iii) 25.6.1952. (iv) (a) Bakhared four times. (b) and (c) N.A. (d) Rows 14" apart. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) N.A. (ix) 25.5.1952 and 25.5.1953.

2. TREATMENTS:
All combinations of (1) and (2)
(1) 2 varieties: V₁=Indore 2 and V₂=Dhar 43.
(2) 6 solutions for soaking: S₀=Control, S₁=Water, S₂=0.25, S₃=0.5, S₄=0.75 and S₅=1.00 molar solutions of AJS.

3. DESIGN:
(i) 2 x 6 Fact. in R.B.D. (ii) (a) 12. (b) N.A. (iii) 4. (iv) (a) 55' x 11'8". (b) 50' x 7'. (v) 24' on each side. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Kapas yield. (iv) (a) 1948 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 253 lb./ac.
(ii) 158.7 lb./ac.
(iii) Only V effect is highly significant.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S₀</th>
<th>S₁</th>
<th>S₂</th>
<th>S₃</th>
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<td>336</td>
<td>270</td>
<td>192</td>
<td>194</td>
<td>166</td>
<td>253</td>
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</table>

S.E. of V marginal means =32.5 lb./ac.
S.E. of S marginal means =56.4 lb./ac.
S.E. of body of table =79.4 lb./ac.
Crop : - Cotton.  
Site :- Institute of Plant Industry, Indore.  
Ref : - M.P. 51(94). 
Type : - 'C'.

Object : - To find out proper spacing for Cotton crop.

1. BASAL CONDITION:
   (i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   Two spacings between rows:
   1. Control : 18".
   2. A set of treatments with closer spacings i.e. less than 18" spacing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 2. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 15'x45'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Kapas yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Exp. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
   (i) 219 lb./ac. 
   (ii) 11.66 lb./ac. 
   (iii) Treatment difference is highly significant.
   (iv) Av. yield of kapas in lb./ac. 
      Treatment       Av. yield
      1. 171 
      2. 267 
      S.E./mean = 4.76 lb./ac. 

---

Crop : - Cotton.  
Site :- Institute of Plant Industry, Indore.  
Ref : - M.P. 53(6). 
Type : - 'C'.

Object : - To compare the effect of drilling cotton seeds in dry soil before the advent of rains with the normal sown seed at the break of monsoon.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Groundnut. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) One bakharing. (b) Drilling. (c) to (e) N.A. (v) Nil. (vi) Dhar 43. (vii) Unirrigated. (viii) Hand weeding two lines followed by interculture with daura. (ix) 32". (x) 4 pickings on 18.11.1953, 12.12.1953, 18.1.1954 and 5.3.1954.

2. TREATMENTS:
   2. Pre-monsoon sowing on 22.6.1953.

3. DESIGN:
   (i) R.B.D (ii) (a) 3. (b) N.A. (iii) 8. (iv) (a) 50'x28". (b) 45'x21" 4", (v) 2 rows on each side and 3' on each end. (vii) Yes.

4. GENERAL:
   (i) Normal. (ii) Nil. (iii) Kapas yield. (iv) (a) 1950 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 346.0 lb./ac. 
   (ii) 38.84 lb./ac. 
   (iii) Treatments do not differ significantly.
Crop :- Cotton.  
Site :- Institute of Plant Industry, Indore.  
Ref :- M.P. 53(1).  
Type :- 'C'.

Object :- To study the effect of various cultural operations on the yield of desi Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Jowar and tur. (c) Mixture of A/S and G.N.C.  (ii) (a) Black cotton soil. (b) N.A.  
(iii) 9.7.1953.  (iv) (a) Bakhar once. (b) Drilled. (c) 20 lb./ac. (d) Rows 14" apart. (e) N.A.  
(ix) 32.53'. (x) 3 pickings on 1.12.1953, 6.1.1954 and 1.2.1954.

2. TREATMENTS:
Main-plot treatments :
4 ploughings : P1=One ploughing + bakhar, P2=Two ploughings+bakhar, P3=Bakhar and  
P4=Ploughing. 

Sub-plot treatments :
7 cultural operations : C0=Control, C1=Hand weeding, C2=Interculture with daura, C3=Interculture  
with ridges, C4=Hand weeding+interculture with daura, C5=Hand weeding  
+interculture with ridges and C6=Hand weeding+interculture with daura  
and ridges.

3. DESIGN :
(i) Split-plot. (ii) (a) 4 main-plots/block and 7 sub-plots/main-plot. (b) N.A.  
(iii) 4. (iv) (a) 40'x18' 8". (b) 35'x14'. (v) 2 rows on each side and 24' on each end. (vi) Yes.

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

5. RESULTS:
(i) 481.5 lb./ac.  
(ii) (a) 199.3 lb./ac.  
(b) 98.6 lb./ac.  
(iii) C effect alone is highly significant, 
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>C0</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>30.5</td>
<td>577.2</td>
<td>274.7</td>
<td>308.0</td>
<td>621.7</td>
<td>654.9</td>
<td>596.1</td>
<td>437.6</td>
</tr>
<tr>
<td>P3</td>
<td>33.3</td>
<td>635.5</td>
<td>346.9</td>
<td>324.7</td>
<td>771.4</td>
<td>702.1</td>
<td>518.9</td>
<td>476.1</td>
</tr>
<tr>
<td>P2</td>
<td>47.2</td>
<td>746.5</td>
<td>222.0</td>
<td>321.9</td>
<td>743.7</td>
<td>743.7</td>
<td>682.6</td>
<td>501.1</td>
</tr>
<tr>
<td>P4</td>
<td>66.6</td>
<td>607.7</td>
<td>316.3</td>
<td>388.3</td>
<td>710.4</td>
<td>729.8</td>
<td>760.3</td>
<td>511.4</td>
</tr>
<tr>
<td>Mean</td>
<td>44.4</td>
<td>641.7</td>
<td>290.0</td>
<td>355.8</td>
<td>711.7</td>
<td>707.6</td>
<td>639.5</td>
<td>481.5</td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. P marginal means = 53.27 lb./ac.  
2. C marginal means = 34.86 lb./ac.  
3. C means at the same level of P = 69.72 lb./ac.  
4. P means at the same level of C = 83.68 lb./ac.
Crop := Cotton.

Site := Institute of Plant Industry, Indore.

Object := To find out the best combination of spacing and seed rate for Cotton crop.

1. **BASEL CONDITIONS**:

   (i) (a) No. (b) Groundnut. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 32.5 lb./ac. once. (b) to (d) As per treatments. (e) N.A. (vi) Nil. (vii) Dhar-43. (vii) 3 hand weedicings and interculture with *daura*. (ix) 32.5 lb./ac. (x) 2 pickings on 4.12.1953 and 23.1.1954.

2. **TREATMENTS**:

   Main-plot treatments:
   - 3 seed rates: \( R_1 = 10, R_2 = 20 \) and \( R_3 = 30 \) lb./ac.

   Sub-plot treatments:
   - 4 row spacings: \( S_1 = 7, S_2 = 14, S_3 = 21 \) and \( S_4 = 28 \) inches.

3. **DESIGN**:

   (i) Split-plot. (ii) (a) 3 main-plots/block and 4 sub-plots/main-plot. (b) N.A. (iii) 45'. (iv) \( 40' \times 9' \). (v) 2' on either side. (vi) Yes.

4. **GENERAL**:

   (i) Poor growth. (ii) No. (iii) Kapas yield. (iv) a) 1953 to 1956. (v) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. **RESULTS**:

   (i) 23 lb./ac. (ii) (a) 62.95 lb./ac. (b) 54.19 lb./ac.

   (iii) R effect alone is highly significant. (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( S_1 )</th>
<th>( S_2 )</th>
<th>( S_3 )</th>
<th>( S_4 )</th>
<th>Mean</th>
</tr>
</thead>
</table>
   \( R_1 \) | 261    | 263    | 256    | 210    | 248  |
   \( R_2 \) | 224    | 325    | 223    | 249    | 255  |
   \( R_3 \) | 293    | 315    | 266    | 276    | 286  |

   Mean 259 299 248 245 263

   S.E. of difference of two:
   1. R marginal means \( \approx 22.26 \) lb./ac.
   2. S marginal means \( \approx 22.12 \) lb./ac.
   3. S means at the same level of R \( \approx 18.40 \) lb./ac.
   4. R means at the same level of S \( \approx 30.96 \) lb./ac.

---

Crop := Cotton.

Site := Institute of Plant Industry, Indore.

Object := To study the effect of pre-monsoon and monsoon sowing on different Cotton varieties.

1. **BASEL CONDITIONS**:

   (i) (a) No. (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a), (b) N.A. (iv) 20 lb./ac. (d) 14'. (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) 3 hand weedicings and interculture with *daura*. (ix) 32.5 lb./ac. (x) 5 pickings on 4.12.1952, 18.12.1952, 16.1.1953, 9.2.1953 and 12.3.1953.

2. **TREATMENTS**:

   All combinations of (1) and (2)
   (1) 2 dates of sowing: \( D_1 = \) Pre-monsoon (26.6.1952) and \( D_2 = \) Monsoon (29.8.1952).
   (2) 2 varieties: \( V_1 = \) Dhar and \( V_2 = \) Indore.
3. DESIGN:
(i) 2 x 2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) 50' x 42'. (b) 45' x 37.4'. (v) 2½' on either side. (vi) Yes.

4. GENERAL:
(i) Normal. (ii) Nil. (iii) Kapas yield. (iv) (a) 1948 to 1953. (b) No. (c) N.A. (v) (a) No. (b) N.A.- (v) and (vii) Nil.

5. RESULTS:
(i) 719 lb./ac. (ii) 242.6 lb./ac. (iii) V effect alone is highly significant. (iv) Av. yield of Kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>( D_1 )</th>
<th>( D_2 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_1 )</td>
<td>846</td>
<td>1074</td>
<td>960</td>
</tr>
<tr>
<td>( V_2 )</td>
<td>457</td>
<td>498</td>
<td>477</td>
</tr>
<tr>
<td>Mean</td>
<td>652</td>
<td>786</td>
<td>719</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 90.9 lb./ac.
S.E. of body of table = 121.3 lb./ac.

Crop = Cotton. Ref:· M.P. 52(16).
Site = Govt. Farm, Khandwa. Type = 'CM'.

Object:- To compare the effect of G.M., F.Y.M. and A/S along with different spacings on Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Medium black cotton soil. (b) N.A. (iii) 7.7.1952. (iv) (a) Bakhar. (b) N.A. (c) 16 lb./ac. (d) As per treatments. (e) -. (v) N.A. (vi) H. 420 (medium). (v) Unirrigated. (viii) Weeding. (ix) 16.14*. (x) 29.11.1952 and 29.12.1952.

2. TREATMENTS:
1. No manure—18" spacing.
2. 10 C.L./ac. of F.Y.M.—18" spacing.
3. 20 lb./ac. of N as A/S drilled at sowing—18" spacing.
4. 20 lb./ac. of N as A/S top dressed—18" spacing.
5. Sanhemp—9" spacing.
6. Sanhemp+1 cw/ac. of P\(_2\)O\(_5\) drilled at sowing—9" spacing.
7. Udid as G.M—9" spacing.
8. Udid+1 cw/ac. of P\(_2\)O\(_5\) drilled at sowing—9" spacing.
9. No manure—24" spacing.
10. 10 C.L./ac. of F.Y.M.—24" spacing.
11. 20 lb./ac. of N as A/S drilled at sowing—24" spacing.
12. 20 lb./ac. of N as A/S top dressed—24" spacing.
14. Sanhemp+1 cw/ac. of P\(_2\)O\(_5\) drilled at sowing—12" spacing.
15. Udid—12" spacing.
16. Udid+1 cw/ac. of P\(_2\)O\(_5\) drilled at sowing—12" spacing.

3. DESIGN:
(i) R.B.D. (ii) (a) 16. (b) N.A. (iii) 4. (iv) (a) 13' x 37.3'. (b) 12' x 36.3'. (v) 'Y' on either side. (vi) Yes.

4. GENERAL:
(i) Satisfactory. (ii) Nil. (iii) Kapas yield. (iv) (a) 1952-1956. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.
5. RESULTS:

(i) 484.4 lb./ac.
(ii) 100.0 lb./ac.
(iii) Treatments do not differ significantly.
(iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>375.0</td>
</tr>
<tr>
<td>2</td>
<td>550.0</td>
</tr>
<tr>
<td>3</td>
<td>562.5</td>
</tr>
<tr>
<td>4</td>
<td>550.0</td>
</tr>
<tr>
<td>5</td>
<td>475.0</td>
</tr>
<tr>
<td>6</td>
<td>493.8</td>
</tr>
<tr>
<td>7</td>
<td>475.0</td>
</tr>
<tr>
<td>8</td>
<td>512.5</td>
</tr>
</tbody>
</table>

S.E./mean = 50.00 lb./ac.

606.1 lb. fac.
143.6 lb./ac.

Treatments differ highly significantly.
(iv) **Av. yield of kapas in lb./ac.**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>472.5</td>
<td>9.</td>
<td>603.7</td>
</tr>
<tr>
<td>2.</td>
<td>508.7</td>
<td>10.</td>
<td>755.7</td>
</tr>
<tr>
<td>3.</td>
<td>535.0</td>
<td>11.</td>
<td>776.2</td>
</tr>
<tr>
<td>4.</td>
<td>522.5</td>
<td>12.</td>
<td>738.7</td>
</tr>
<tr>
<td>5.</td>
<td>469.5</td>
<td>13.</td>
<td>563.7</td>
</tr>
<tr>
<td>6.</td>
<td>546.7</td>
<td>14.</td>
<td>863.3</td>
</tr>
<tr>
<td>7.</td>
<td>435.0</td>
<td>15.</td>
<td>611.3</td>
</tr>
<tr>
<td>8.</td>
<td>492.0</td>
<td>16.</td>
<td>803.8</td>
</tr>
</tbody>
</table>

S.E./mean $=71.80$ lb./ac.

---

**Crop:** Cotton.  
**Site:** Institute of Plant Industry, Indore.  
**Ref:** M.P. 49(9).  
**Type:** 'CMV'.

Object: To study the effect of dates of sowing and manures on the yield of different varieties of Cotton.

1. **BASAL CONDITIONS:**
   (i) (a) to (c) N.A.  (ii) (a) Black cotton soil. (b) N.A.  (iii) As per treatments.  (iv) (a) and (b) N.A.  (c) As per treatments.  (d) 14'.  (e) N.A.  (v) N.A.  (vi) As per treatments.  (vii) to (x) N.A.

2. **TREATMENTS:**
   **Main-plot treatments:**
   All combinations of (1), (2) and (3)
   (1) 3 varieties: $V_1=\text{Dhar 43}$, $V_2=\text{Jarilla}$ and $V_3=\text{Indore 1}$.  
   (2) 2 times of sowing: $S_1=\text{Pre-monsoon}$ and $S_2=\text{At monsoon}$.  
   (3) 2 seed rates: $R_1=20$ and $R_2=30$ lb./ac.

   **Sub-plot treatments:**
   2 levels of N as A/S: $N_0=0$ and $N_1=30$ lb./ac.

3. **DESIGN:**
   (i) Split-plot.  (ii) (a) 12 main-plots/block; 2 sub-plots/main-plot.  (b) N.A.  (iii) 4.  (iv) (a) 9'4"x30'.  (b) 4'8"x25'.  (v) Two rows on both sides and 2' of each row at both ends.  (vi) Yes.

4. **GENERAL:**
   (i) and (ii) N.A.  (iii) Kapas yield.  (iv) (a) to (c) N.A.  (v) (a) and (b) N.A.  (vi) First sowing was done on 10-6-1949. But there were heavy rains on 3rd and 4th June 1949. Hence the experiment cannot be treated as pre-monsoon vs monsoon sowing but as early sowing vs normal sowing.  (vii) Nil.

5. **RESULTS:**
   (i) 297.8 lb./ac.
   (ii) (a) 111.9 lb./ac.  
   (b) 38.9 lb./ac.
   (iii) V, R, S and interactions NV, NR and NS are highly significant.
   (iv) **Av. yield of kapas in lb./ac.**

<table>
<thead>
<tr>
<th></th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$R_1$</th>
<th>$R_2$</th>
<th>$N_0$</th>
<th>$N_1$</th>
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</tr>
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<tr>
<td>$V_1$</td>
<td>570.3</td>
<td>180.9</td>
<td>393.8</td>
<td>357.3</td>
<td>325.2</td>
<td>425.9</td>
<td>375.6</td>
</tr>
<tr>
<td>$V_2$</td>
<td>437.5</td>
<td>107.9</td>
<td>287.3</td>
<td>258.1</td>
<td>285.9</td>
<td>259.6</td>
<td>272.7</td>
</tr>
<tr>
<td>$V_3$</td>
<td>439.0</td>
<td>51.0</td>
<td>247.9</td>
<td>242.1</td>
<td>250.4</td>
<td>259.6</td>
<td>245.0</td>
</tr>
<tr>
<td>Mean</td>
<td>482.3</td>
<td>113.3</td>
<td>309.7</td>
<td>285.9</td>
<td>280.5</td>
<td>315.0</td>
<td>297.8</td>
</tr>
<tr>
<td>$N_0$</td>
<td>466.3</td>
<td>114.7</td>
<td>294.6</td>
<td>266.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$N_1$</td>
<td>518.2</td>
<td>111.8</td>
<td>324.8</td>
<td>305.3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>$R_1$</td>
<td>500.7</td>
<td>118.6</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R_2$</td>
<td>463.8</td>
<td>107.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
S.E. of difference of two
1. V marginal means = 27.97 lb./ac.
2. S or Q marginal means = 22.84 lb./ac.
3. N marginal means = 7.93 lb./ac.
4. N means at the same level of V = 13.76 lb./ac.
5. V means at the same level of N = 29.62 lb./ac.
6. N means at the same level of R or S = 11.23 lb./ac.
7. R or S means at the same level of N = 24.18 lb./ac.
8. means in the body of V×R or V×S tables = 39.57 lb./ac.
9. means in the body of R×S table = 32.30 lb./ac.

Crop :- Cotton.
Site :- Central Res. Farm, Ujjain.
Ref :- M.P. 50(31).
Type :- 'CMIV'.

Object :- To study the response of different varieties to application of N and sowing conditions.

1. BASAL CONDITIONS :
   (i) (a) N.A. (b) Gram. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments. (iv) (a) Bedding - (b) Drilling. (c) N.A. (d) 18°. (e) N.A. (v) N.A. (vi) As per treatments. (vii) Unirrigated. (viii) 3 Inter-cultivations with desi doura. (ix) N.A. (x) 23.11.1950. and 13.1.1951.

2. TREATMENTS :
   Main-plot treatments :
   Six manures: M 0 =0, M 1 =10 lb./ac. of N as A/S, M 2 =20 lb./ac. of N as A/S, M 3 =10 C.L./ac. of P.Y M. M 4 =M 1 +M 3 and M 5 =M 2 -M 3 .
   Sub-plot treatments :
   2 sowing dates: D 1 =Sowing before rains on 16,17.6.1950. and D 2 =With rains on 13.7.1950.
   Sub-sub-plot treatments :
   2 varieties: V 1 =Combodia and V 2 =G-16.

3. DESIGN :
   (i) Split split-plot. (ii) (a) 6 main-plots/block ; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A.
   (iii) 6. (iv) (a) Main-plot: 24'×72', sub-plot: 12'×72' and sub-sub-plot: 6'×72'. (b) 3'×66'. (v) One row on both sides and 3' of each row at both ends.
   (vi) Yes.

4. GENERAL :
   (i) N.A. (ii) N.A. (iii) Kapas yield, ginning percentage per plot and staple length. (iv) (a) 1950 to (v)51. (b) and (c) N.A. (v) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS :
   (i) 466 lb./ac.
   (ii) (a) 113.7 lb./ac.
   (b) 111.5 lb./ac.
   (c) 81.1 lb./ac.
   (iii) M and V effects are significant. Others are not significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>M 0</th>
<th>M 1</th>
<th>M 2</th>
<th>M 3</th>
<th>M 4</th>
<th>M 5</th>
<th>Mean</th>
<th>V 1</th>
<th>V 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>D 2</td>
<td>477</td>
<td>477</td>
<td>474</td>
<td>472</td>
<td>488</td>
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<td>490</td>
<td>475</td>
<td>466</td>
</tr>
<tr>
<td>D 2</td>
<td>372</td>
<td>463</td>
<td>468</td>
<td>441</td>
<td>452</td>
<td>518</td>
<td>417</td>
<td>422</td>
<td>402</td>
</tr>
<tr>
<td>Mean</td>
<td>400</td>
<td>470</td>
<td>471</td>
<td>457</td>
<td>470</td>
<td>521</td>
<td>449</td>
<td>449</td>
<td>484</td>
</tr>
<tr>
<td>V 1</td>
<td>360</td>
<td>468</td>
<td>456</td>
<td>425</td>
<td>461</td>
<td>523</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>V 2</td>
<td>440</td>
<td>472</td>
<td>486</td>
<td>488</td>
<td>479</td>
<td>540</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of difference of two
1. M marginal means =32.8 lb./ac. 6. V means at a level of M = 33.1 lb./ac.
2. D marginal means =18.6 lb./ac. 7. M means at a level of V = 40.3 lb./ac.
4. D means at a level of M =45.5 lb./ac. 9. D means at a level of V = 22.9 lb./ac.
5. M means at a level of D =45.9 lb./ac.
Crop: Cotton.  
Site: Central Res. Farm, Ujjain.  
Ref: M.P. 51(3).  
Type: ‘CMV.’

Object: To study the response of different varieties to application of N and sowing conditions.

1. BASAL CONDITIONS:
(i) (a) No. (b) Wheat. (c) No. (ii) (a) Black cotton soil. (b) N.A. (iii) As per treatments (iv) (a) to (e) N.A. (v) Nil. (vi) As per treatments. (vii) Unirrigated. (viii) Weeding and daura. (ix) 30.87°. (x) N.A.

2. TREATMENTS:

Main-plot treatments:
- 6 manures:
  - M₀ = 0, M₁ = 10 lb./ac. of N as A/S, M₂ = 20 lb./ac. of N as A/S, M₃ = 10 C.L./ac. of P.Y.M.
  - M₄ = M₁ + M₂ and M₅ = M₃ + M₂.

Sub-plot treatments:
- 2 sowing dates: D₁ = Sowing before rains and D₂ = sowing with rains.

Sub-sub-plot treatments:
- 2 varieties: V₁ = Combodia and V₂ = G-16.

3. DESIGN:
(i) Split split-plot. (ii) (a) 6 main-plots/block; 2 sub-plots/main-plot and 2 sub-sub-plots/sub-plot. (b) N.A. (iii) 6. (iv) (a) 6’ X 72’. (b) 3’ X 66’. (v) One row on either side and 3 feet of each row at both ends. (vi) Yes.

4. GENERAL:
(i) Good. (ii) Nil. (iii) Yield of kapas, staple length and ginning percentage. (iv) (a) and (b) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>M₀</th>
<th>M₁</th>
<th>M₂</th>
<th>M₃</th>
<th>M₄</th>
<th>M₅</th>
<th>Mean</th>
<th>V₁</th>
<th>V₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>259</td>
<td>326</td>
<td>449</td>
<td>347</td>
<td>325</td>
<td>257</td>
<td>327</td>
<td>238</td>
</tr>
<tr>
<td>D₂</td>
<td>239</td>
<td>321</td>
<td>393</td>
<td>331</td>
<td>368</td>
<td>304</td>
<td>326</td>
<td>215</td>
</tr>
<tr>
<td>Mean</td>
<td>249</td>
<td>324</td>
<td>421</td>
<td>339</td>
<td>346</td>
<td>281</td>
<td>327</td>
<td>227</td>
</tr>
<tr>
<td>V₁</td>
<td>168</td>
<td>238</td>
<td>311</td>
<td>209</td>
<td>242</td>
<td>192</td>
<td>327</td>
<td></td>
</tr>
<tr>
<td>V₂</td>
<td>329</td>
<td>410</td>
<td>532</td>
<td>469</td>
<td>451</td>
<td>370</td>
<td>227</td>
<td>427</td>
</tr>
</tbody>
</table>

S.E. of difference of two:
1. M marginal means = 33.11 lb./ac. 6. V means at the same level of M = 23.92 lb./ac.
2. D marginal means = 14.58 lb./ac. 7. M means at the same level of V = 57.13 lb./ac.
4. D means at the same level of M = 35.75 lb./ac. 9. D means at the same level of V = 17.60 lb./ac.
5. M means at the same level of D = 41.66 lb./ac.

Crop: Cotton.  
Site: Institute of Plant Industry, Indore.  
Ref: M.P. 53(14).  
Type: ‘D’.

Object: To study the effect of soaking Cotton seeds in molar solution on its yield.

1. BASAL CONDITIONS:
2. TREATMENTS:

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

(1) 3 concentrations: \( C_1 = 0.1, \ C_2 = 0.2 \), and \( C_3 = 0.3 \) molar.

(2) 2 sources of solutions: \( S_1 = A/S \) and \( S_2 = S/S \).

(3) 2 period of soaking: \( H_1 = 4 \) and \( H_2 = 8 \) hours.

3 extra treatments are: \( T_1 = \) Dry seeds (4 plots/block), \( T_2 = \) Soaked in water for 4 hours (2 plots/block) and \( T_3 = \) Soaked in water for 8 hours (2 plots/block).

3. DESIGN:

(i) R.B.D. (ii) (a) 20. (b) N.A. (iii) J. (iv) (a) \( 60 \times 14' \). (b) \( 55 \times 9' \). (v) 2 rows on each side and 2' on each end. (vi) Yes.

4. GENERAL:

(i) Satisfactory. (ii) Nil. (iii) Kapas yield. (iv) (a) 1948-1953. (b) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 373 lb./ac.

(ii) 466 lb./ac.

(iii) None of the effects is significant.

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

\[
\begin{array}{cccc|ccc}
\text{S.E. of } C \text{ marginal means} & =13.46 \text{ lb./ac.} & \text{S.E. of } T_2 \text{ or } T_3 \text{ means} & =19.03 \text{ lb./ac.} \\
\text{S.E. of } H \text{ or } S \text{ marginal means} & =10.99 \text{ lb./ac.} & \text{S.E. of body of } C \times S \text{ or } C \times H \text{ tables} & =19.03 \text{ lb./ac.} \\
\text{S.E. of } T_1 \text{ mean} & =13.46 \text{ lb./ac.} & \text{S.E. of body of } H \times S \text{ tables} & =10.99 \text{ lb./ac.} \\
\end{array}
\]

Crop := Cotton (\textit{Kharif}).

Site := Institute of Plant Industry, Indore.

Object := To find out the effect of insecticides on the yield of Cotton.

1. BASAL CONDITIONS:

(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:

All combinations of (1) and (2) + a control ['no treatment'].

(1) 2 insecticides: \( C_1 = \) Guesrol-550 and \( C_2 = \) Guesrol-4.0.

(2) Number of applications: \( A_1 = \) one and \( A_2 = 2. \)


3. DESIGN:

(i) R.B.D. (ii) (a) S. (b) N.A. (iii) J. (iv) (a) N.A. (b) \( 5' \times 35' \). (v) N.A. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Kapas yield. (iv) (a) N.A. (b) and (c) --. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C).
5. RESULTS:

(i) 268 lb./ac.
(ii) 49.84 lb./ac.
(iii) Control vs. treated is highly significant. A effect is significant. Other effects are not significant.
(iv) Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>A1</th>
<th>A2</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>246</td>
<td>329</td>
<td>288</td>
</tr>
<tr>
<td>C2</td>
<td>257</td>
<td>325</td>
<td>291</td>
</tr>
<tr>
<td>Mean</td>
<td>252</td>
<td>327</td>
<td>290</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 17.62 lb./ac.
S.E. of body of table = 24.92 lb./ac.

### Crop :
Cotton (*Kharif*).

### Site :
Institute of Plant Industry, Indore.

Object:—To find out the effect of insecticides on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) N.A. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2) + 2 controls (no treatment)
(1) 2 insecticides: C1=Guzerol-550 and C2=Guzerol-410.
(2) No. of applications: A1=one, A2=two and A3=three.

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

4. GENERAL:
(i) N.A. (ii) N.A. (iii) *Kapas* yield. (iv) (a) No. (b) nil. (c) —. (v) (a), (b) N.A. (vi) Nil. (vii) Raw data N.A. Expt. conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
(i) to (iii) N.A.
(iv) Av. yield of *kapas* in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>308</td>
<td>256</td>
<td>314</td>
<td>293</td>
</tr>
<tr>
<td>C2</td>
<td>329</td>
<td>288</td>
<td>303</td>
<td>307</td>
</tr>
<tr>
<td>Mean</td>
<td>319</td>
<td>272</td>
<td>309</td>
<td>300</td>
</tr>
</tbody>
</table>

S.E. of C marginal means = 11.83 lb./ac.
S.E. of A marginal means = 14.49 lb./ac.
S.E. of body of table = 20.49 lb./ac.
Crop : Cotton (Kharif).
Site : Institute of Plant Industry, Indore.

Object : To study the effect of spraying hormones on Cotton crop.

1. BASAL CONDITIONS:
(i) (a) Nil, (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) to (e) N.A. (v) N.A. (vi) Unirrigated. (vii) to (x) N.A.

2. TREATMENTS:
All combinations of (1) and (2) + a control.
1. 3 hormones: \( H_1 \) = Tri-iodo Benzoic Acid, \( H_2 \) = Naphthalene acetic acid, \( H_3 \) = Indoly Buteric acid.
2. 2 concentrations: \( C_1 = 25 \) and \( C_2 = 50 \) p.p.m.
8 gallon/ac. of solution sprayed.

3. DESIGN:
(i) R.B.D. (ii) (a) 7, (b) N.A. (iii) 4. (iv) (a) N.A. (b) \( \times 35' \). (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Kharif yield. (iv) (a) to (e) N.A. (v) and (b) N.A. (vi) Nil. (vii) Expt. conducted under Cotton Physiological Scheme (I.P.C.C.).

5. RESULTS:
(i) 7.88 lb/ac.
(ii) 5.7 lb/ac.
(iii) Control vs. others effect is highly significant. \( H \) effect is significant. Others are not significant.
(iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>( H_1 )</th>
<th>( H_2 )</th>
<th>( H_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>( C_1 )</td>
<td>755</td>
<td>823</td>
<td>830</td>
<td>803</td>
</tr>
<tr>
<td>( C_2 )</td>
<td>777</td>
<td>839</td>
<td>848</td>
<td>821</td>
</tr>
<tr>
<td>Mean</td>
<td>766</td>
<td>831</td>
<td>839</td>
<td>812</td>
</tr>
</tbody>
</table>

S.E. of \( H \) marginal mean = 19.65 lb/ac.
S.E. of C marginal mean = 16.04 lb/ac.
S.E. of body of table = 21.79 lb/ac.

Crop : Cotton (Kharif).
Site : Institute of Plant Industry, Indore.

Object : To study the effect of spraying hormones on Cotton crop.

1. BASAL CONDITIONS:
(i) (a) Nil, (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) to (e) N.A. (v) N.A. (vi) Indore I. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
1. Control.
2. Spraying Tri-iodo Benzoic Acid (TIBA).
3. Spraying Naphthalene Acetic Acid (NAA).
4. Spraying Indoly Buteric Acid (IBA).
Concentrations of sprays—N.A.

3. DESIGN:
(i) R.B.D. (ii) (a) and (b) N.A. (iii) 4. (iv) (a) N.A. (b) \( \times 27' \). (v) N.A. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A. (iii) Kapas yield. (iv) (a) to (e) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.).

5. RESULTS:
(i) 798 lb/ac.
(ii) 63.40 lb/ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>802</td>
</tr>
<tr>
<td>2.</td>
<td>735</td>
</tr>
<tr>
<td>3.</td>
<td>832</td>
</tr>
<tr>
<td>4.</td>
<td>823</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 31.70 lb/ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Site :- Institute of Plant Industry, Indore.
Object :- To study the effect of spraying harmones on Cotton crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Indore I. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
1. Control.
2. Spraying Tri-iodo Benzoic Acid (TIBA).
3. Spraying Naphthalene Acitic Acid (NAA).
4. Spraying Indoly Buteric Acid (IBA).
Concentrations of sprays—N.A.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 7'x30'. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Kapas yield. (iv) (a) to (e) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.),

5. RESULTS:
(i) 793 lb/ac.
(ii) 100.4 lb/ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of kapas in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>814</td>
</tr>
<tr>
<td>2.</td>
<td>742</td>
</tr>
<tr>
<td>3.</td>
<td>804</td>
</tr>
<tr>
<td>4.</td>
<td>814</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 50.2 lb/ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Site :- Institute of Plant Industry, Indore.
Object :- To study the effect of spraying harmones on the Cotton crop.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 22.6.1952. (iv) (a) to (e) N.A. (v) 20 lb/ac. of N as municipal compost applied in May 1952. (vi) Dhar-43. (vii) Unirrigated. (viii) to (x) N.A.
2. TREATMENTS:
   1. Control.
   2. Spraying Tri-iodo Benzoic Acid (TIBA).
   3. Spraying with Naphthalene Acetic Acid (NAA).
   4. Spraying with Indoly Buteric Acid (IBA).
   Date of spraying 12.8.1952.

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

4. GENERAL:
   (i) and (ii) N.A. (iii) Kupar yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) N.I. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.S.).

5. RESULTS:
   (i) 481 lb/ac.
   (ii) 49.94 lb/ac.
   (iii) Treatment differences are significant.
   (iv) Av. yield of kapar in lb/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>471</td>
</tr>
<tr>
<td>2.</td>
<td>494</td>
</tr>
<tr>
<td>3.</td>
<td>443</td>
</tr>
<tr>
<td>4.</td>
<td>518</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>24.97 lb/ac.</td>
</tr>
</tbody>
</table>

Crop :- Cotton (Kharif).
Site :- Institute of Plant Industry, Indore.

Object :- To study the effect of spraying harmones on Cotton yield.

1. BASAL CONDITIONS:
   (i) (a) Nil (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 3.7.1953. (iv) (a) to (c) N.A. (v) Nil. (vi) Indore. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2) +2 controls.
   (1) 3 concentrations of alpha naphthalene acetic acid : C1=10, C2=20 and C3=30 p.p.m.
   (2) 2 dates of spraying : D1=27.8.1953 and D2=16.9.1953. Alpha Naphthalene Acetic acid sprayed at 80 gallon/ac.

3. DESIGN
   (i) R.B.D. (ii) 8. (b) N.A. (iii) 4. (iv) 4. (a) N.A. (v) 46' x 12'. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Kaper yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.S.).

5. RESULTS:
   (i) 106 lb/ac.
   (ii) 46.09 lb/ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of kapar in lb/ac.

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>75</td>
<td>120</td>
<td>115</td>
<td>103</td>
</tr>
<tr>
<td>D2</td>
<td>110</td>
<td>131</td>
<td>69</td>
<td>103</td>
</tr>
<tr>
<td>Mean</td>
<td>93</td>
<td>125</td>
<td>92</td>
<td>103</td>
</tr>
</tbody>
</table>

S.E. of D marginal mean =13.30 lb/ac.
S.E. of C marginal mean =16.29 lb/ac.
S.E. of body of table =23.04 lb/ac.

Ref :- M.P. 53(105).
Type :- 'D'.
Crop : Cotton (Kharif).
Site : Institute of Plant Industry, Indore.

Object : To study the effect of spraying harmones on Cotton crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Groundnut. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 2.7.1953. (iv) (a) to (e) N.A.  
   (v) Nil. (vi) Dhar 43. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :
   All combinations of (1) and (2)+2 controls
   (1) 3 concentrations of Alpha Naphthalene Acetic Acid : C₁=10, C₂=20 and C₃=30 p.p.m.
   (2) 2 dates of spraying : D₁=26.8.1953 and D₂=15.9.1953.
   Alpha Naphthalene Acetic Acid sprayed at 80 gallon/ac.

3. DESIGN :
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 3. (iv) (a) N.A. (b) 37×16'. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Kapas yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.)

5. RESULTS :
   (i) 537 lb./ac.
   (ii) 64.87 lb./ac.
   (iii) 'Control vs. other effects' alone is highly significant.
   (iv) Av. yield of kapas in lb./ac.

<table>
<thead>
<tr>
<th>Control</th>
<th>C₁</th>
<th>C₂</th>
<th>C₃</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>D₁</td>
<td>568</td>
<td>538</td>
<td>517</td>
<td>541</td>
</tr>
<tr>
<td>D₂</td>
<td>583</td>
<td>593</td>
<td>569</td>
<td>581</td>
</tr>
<tr>
<td>Mean</td>
<td>575</td>
<td>565</td>
<td>543</td>
<td>561</td>
</tr>
</tbody>
</table>

S.E. of D marginal mean =21.62 lb./ac.
S.E. of C marginal mean =26.48 lb./ac.
S.E. of body of table =37.45 lb./ac.

Crop : Cotton (Kharif).
Site : Institute of Plant Industry, Indore.

Object : To study the effect of spraying harmones on Cotton crop.

1. BASAL CONDITIONS :
   (i) (a) Nil. (b) Moong. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.7.1953. (iv) (a) to (e) N.A.  
   (v) Nil. (vi) Dhar 43. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS :
   All combinations of (1) and (2)+2 controls
   (1) 3 concentrations of Alpha Naphthalene Acetic Acid : C₁=10, C₂=20 and C₃=30 p.p.m.
   (2) 2 dates of spraying : D₁=27.8.1953 and D₂=16.9.1953.
   Alpha Naphthalene Acetic Acid sprayed at 80 gallon/ac.

3. DESIGN :
   (i) R.B.D. (ii) (a) 8. (b) N.A. (iii) 4. (iv) (a) N.A. (b) 37×19'. (v) N.A. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Kapas yield. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) Experiment conducted under Cotton Physiological Scheme (I.C.C.C.)
5. RESULTS:
(i) 386 lb./ac.
(ii) 98.47 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of karas in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>( C_1 )</th>
<th>( C_2 )</th>
<th>( C_3 )</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>372</td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>D_1</td>
<td>348</td>
<td>376</td>
<td>482</td>
<td>402</td>
</tr>
<tr>
<td>D_2</td>
<td>321</td>
<td>405</td>
<td>410</td>
<td>379</td>
</tr>
<tr>
<td>Mean</td>
<td>335</td>
<td>391</td>
<td>446</td>
<td>391</td>
</tr>
</tbody>
</table>

S E. of D marginal mean = 28.43 lb./ac.
S E. of C marginal mean = 34.83 lb./ac.
S E. of body of table = 49.24 lb./ac.

Crop :- Sugarcane.
Site :- Harsi Experimental Farm, Bagwai.
Object :- To ascertain which of the organic or inorganic manures and their mixtures are best suited to Sugarcane under local conditions.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Fallow. (c) Nil.
(ii) (a) Clay loam. (b) Refer soil analysis, Bagwai.
(iii) 22.2 x 0.42.
(iv) (a) Ploughing and planking. (b) Ridge planting.
(v) to (e) N.A.
(vi) C0.42.
(vii) Irrigated.
(viii) Weeding twice. (ix) 22.55.
(x) N.A.

2. TREATMENTS:
1. F.Y.M. at 120 lb./ac. of N.
2. A/S at 120 lb./ac. of N.
3. G.N.C. at 120 lb./ac. of N.
4. F.Y.M. at 60 lb./ac. of N. + A/S at 60 lb./ac. of N.
5. F.Y.M. at 60 lb./ac. of N. + G.N.C. at 60 lb./ac. of N.
6. Control.

3. DESIGN:
(i) R.B.D. (ii) 6. (b) N.A. (iii) 4. (iv) (a), (b) 75' X 21'. (v) Nil. (vi) Yes.

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

5. RESULTS:
(i) 11.19 ton/ac.
(ii) 1.82 ton/ac.
(iii) Treatment differences are highly significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>10.05</td>
</tr>
<tr>
<td>2.</td>
<td>14.95</td>
</tr>
<tr>
<td>3.</td>
<td>11.92</td>
</tr>
<tr>
<td>4.</td>
<td>12.94</td>
</tr>
<tr>
<td>5.</td>
<td>11.19</td>
</tr>
<tr>
<td>6.</td>
<td>6.11</td>
</tr>
</tbody>
</table>

S.E./mean = 0.91 ton/ac.

Ref. :- M.P. 49(49).
Type :- M.
Crop :- Sugarcane.
Site :– Harsi Experimental Farm, Bagwai.

Object :– To find out suitable manurial dose of N and P for Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Paddy. (c) N.A. (ii) (a) Clay loam. (b) Refer soil analysis, Bagwai. (iii) 9 to 12.2.1951.
   (iv) (a), (b) Ploughing by desi plough. Levelling after giving basal manure. Spreading the manure, ploughing by desi plough 5 times. Making ridges by wadi plough. (c) Total weight of sugarcane sown is 28 mds and 35 srs. (d) 3' between ridges. (e) (v) For two blocks sheep dung at 13 C.L. and for the remaining two blocks F.Y.M. at 16 C.L. (vi) CO.453. (vii) I.ri1.:ated. (viii) Interculturing and two earthings. (ix) 23.3' (x) N.A.

2. TREATMENTS:
   1. A/S at 80 lb./ac. of N. 7. A/S at 80 lb./ac. of N + Super at 50 lb./ac. of P2O5.
   2. A/S at 120 lb./ac. of N. 8. A/S at 160 lb./ac. of N + Super at 50 lb./ac. of P2O5.
   3. A/S at 160 lb./ac. of N. 9. Control (20 C.L. of F.Y.M. + 40 lb. of N as G.N.C.)
   4. A/S at 200 lb./ac. of N.
   5. 80 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio.
   6. 100 lb./ac. of N as A/S and G.N.C. in 1 : 1 ratio.

3. DESIGN:
   (i) R.B.D. (ii) (a) 9. (b) N.A. (iii) 4. (iv) (a) 24'x78'. (b) 12'x72'. (v) Two rows on both sides and 3' of each row at both ends. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Total weight of sugarcane per plot, number of canes per plot. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 47.16 ton/ac.
   (ii) 3.48 ton/ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of sugarcane in ton./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>41.55</td>
<td>6.</td>
<td>51.33</td>
</tr>
<tr>
<td>2.</td>
<td>42.92</td>
<td>7.</td>
<td>51.07</td>
</tr>
<tr>
<td>3.</td>
<td>45.31</td>
<td>8.</td>
<td>55.46</td>
</tr>
<tr>
<td>4.</td>
<td>48.39</td>
<td>9.</td>
<td>40.70</td>
</tr>
<tr>
<td>5.</td>
<td>47.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S.E./mean</td>
<td></td>
<td>=1.74 ton/ac.</td>
</tr>
</tbody>
</table>

Crop :- Sugarcane.
Site :- Institute of Plant Industry, Indore.

Object :– To study the effect of different doses of N as mixtures of A/S, G.N.C. and Castor cake singly and in combination with F.Y.M. and Farm Compost.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Bakharing. (b) N.A. (c) 2400 cane setts/ca. (d) 3'. (e) N.A. (v) As per treatments. (vi) CO. 419. (vii) I.rir1.:ated. (viii) to (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 2 basal manures : B1=F.Y.M. and B2 = F.C. each at 50 lb./ac. of N.
   (2) 4 levels of N : N1=50, N2=100, N3=150 and N4=200 lb./ac.
   (3) 2 sources of N : S1=A/S+G.N.C. in 1 : 1 ratio and S2=A/S+Castor cake in 1 : 1 ratio.

3. DESIGN:
   (i) 2x4x2 Past. in R.B.D. (ii) (a) 16. (b) N.A. (iii) 3. (iv) (a) 18'x40'. (b) 12'x40'. (c) One row on both sides. (vi) Yes.
4. GENERAL:

(i) and (ii) N.A.  (iii) No. of canes, cane weight, weight of juice and gur.  (iv) (a) to (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

RESULTS:

(i) 5.46 ton/ac.
(ii) 1.46 ton/ac.
(iii) N effect is highly significant, interaction B x N x S is significant, while all other effects are not significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N1</th>
<th>N2</th>
<th>N3</th>
<th>N4</th>
<th>Mean</th>
<th>S1</th>
<th>S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>4.38</td>
<td>5.76</td>
<td>6.33</td>
<td>6.07</td>
<td>5.63</td>
<td>5.69</td>
<td>5.57</td>
</tr>
<tr>
<td>B2</td>
<td>3.44</td>
<td>5.37</td>
<td>6.29</td>
<td>6.05</td>
<td>5.29</td>
<td>5.49</td>
<td>5.08</td>
</tr>
<tr>
<td>Mean</td>
<td>3.91</td>
<td>5.56</td>
<td>6.31</td>
<td>6.06</td>
<td>5.46</td>
<td>5.59</td>
<td>5.33</td>
</tr>
<tr>
<td>S1</td>
<td>4.38</td>
<td>5.66</td>
<td>6.68</td>
<td>5.64</td>
<td>5.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>3.43</td>
<td>5.46</td>
<td>5.94</td>
<td>5.48</td>
<td>5.33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of N marginal means = 0.42 ton/ac.
S.E. of B or S marginal means = 0.30 ton/ac.
S.E. of body of B x N or N x S table = 0.60 ton/ac.
S.E. of body of B x S table = 0.42 ton/ac.

Crop : Sugarcane.  
Site : Institute of Plant Industry, Indore.  
Ref : M.P. 51(10).  
Type : 'M'.

Object :—To study the effect of different doses of N as mixtures of A/S, G.N.C. and Castor cake singly and in combination with F.Y.M. and Farm Compost.

1. BASAL CONDITIONS:

(i) (a) N.A.  (b) N.A.  (c) Nil.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) 20.2.1951.  (iv) (a) N.A.  (b) Planted.  (c) N.A.  (d) Rows 3' apart.  (e) N.A.  (v) As per treatments.  (vi) CO. 415.  (vii) Irrigated (viii) to (x) N.A.

2. TREATMENTS:

All combinations of (1), (2) and (3)
(1) 2 basal dressings : B1=F.Y.M. and B2=F.C. each at 50 lb./ac. of N.
(2) 4 levels of N : N1=50, N2=100, N3=150 and N4=200 lb./ac. of N.
(3) 2 sources of N : S1=A/S+G.N.C. in 1 : 1 ratio and S2=A/S+Castor cake in 1 : 1 ratio.

3. DESIGN:

(i) 2x4x2 Fact. in R.B.D.  (ii) (a) 16.  (b) 60°x144'.  (iii) 3.  (iv) (a) 30°x18'.  (b) 30°x12'.  (v) One row on both sides.  (vi) Yes.

4. GENERAL:

(i) and (ii) N.A.  (iii) Stand of 4 rows, cane number, cane weight and gur weight.  (iv) (a) 1948—N.A.  (b) and (c) N.A.  (v) (a) and (b) N.A.  (vi) and (vii) Nil.

5. RESULTS:

(i) 30.49 ton/ac.  
(ii) 4.29 ton/ac.  
(iii) S effect and interaction B x N x S are significant. Other effects are not significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th></th>
<th>N₁</th>
<th>N₂</th>
<th>N₃</th>
<th>N₄</th>
<th>Mean</th>
<th>S₁</th>
<th>S₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>B₁</td>
<td>29.16</td>
<td>33.12</td>
<td>29.67</td>
<td>28.06</td>
<td>30.00</td>
<td>30.74</td>
<td>29.26</td>
</tr>
<tr>
<td>B₂</td>
<td>29.37</td>
<td>32.48</td>
<td>31.95</td>
<td>30.17</td>
<td>30.99</td>
<td>33.03</td>
<td>28.96</td>
</tr>
<tr>
<td>Mean</td>
<td>29.27</td>
<td>32.80</td>
<td>30.81</td>
<td>29.11</td>
<td>30.49</td>
<td>31.88</td>
<td>29.11</td>
</tr>
<tr>
<td>S₁</td>
<td>31.29</td>
<td>34.38</td>
<td>30.95</td>
<td>30.92</td>
<td>31.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S₂</td>
<td>27.75</td>
<td>31.21</td>
<td>30.67</td>
<td>27.31</td>
<td>29.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

S.E. of N marginal means = 1.24 ton/ac.
S.E. of B or S marginal means = 0.88 ton/ac.
S.E. of body of B×N or S×N table = 1.75 ton/ac.
S.E. of body of B×S table = 1.24 ton/ac.

Crop: Sugarcane. Ref: M.P. 49(41).
Site: Govt. Seed and Demonstration Farm, Bilaspur. Type: 'C'.

Object: —To ascertain the most suitable spacing for Sugarcane on kankar soil.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Kankar.  (b) N.A.  (iii) N.A.  (iv) (a) to (c) N.A.  (d) As per treatments.  (e) N.A.  (v) 150 lb/ac. of N.  (vi) CO. 312.  (vii) Irrigated.  (viii) and (ix) N.A.  (x) 12 to 15.3.1950.

2. TREATMENTS:
   4 spacings between rows: S₁ = 2.5', S₂ = 3', S₃ = 3.5' and S₄ = 4'.

3. DESIGN:
   (i) R.B.D.  (ii) (a) 4.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 33'×16'.  (v) Nil.  (vi) Yes.

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

5. RESULTS:
   (i) 21.42 ton/ac.
   (ii) 4.05 ton/ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>S₁</td>
<td>23.56</td>
</tr>
<tr>
<td>S₂</td>
<td>22.62</td>
</tr>
<tr>
<td>S₃</td>
<td>19.81</td>
</tr>
<tr>
<td>S₄</td>
<td>19.71</td>
</tr>
</tbody>
</table>

S.E./mean = 1.65 ton/ac.

Crop: Sugarcane. Ref: M.P. 49(42).
Site: Govt. Seed and Demonstration Farm, Bilaspur. Type: 'C'.

Object: —To find out the optimum seed rate for Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) N.A.  (b) N.A.  (iii) N.A.  (iv) (a) N.A.  (b) Planted in rows.  (c) As per treatments.  (d) 24' apart.  (e) —.  (v) 150 lb/ac. of N.  (vi) CO. 312.  (vii) Irrigated.  (viii) to (x) N.A.
2. TREATMENTS:

5 seed rates: \( R_1 = 12000, R_2 = 15000, R_3 = 18000, R_4 = 21000 \) and \( R_5 = 24000 \) sets/ac.

3. DESIGN:

(i) R.B.D. (ii) 5. (b) N.A. (iii) 6. (iv) (a) and (b) 33 \( \times 16 \)'. (v) Nil. (v) Yes.

4. GENERAL:

(i) and ii) N.A. (iii) Sugarcane, juice and gur yield. (iv) (a) 1938-1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 2.84 ton/ac.
(ii) 2.14 ton/ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of sugarcane in ton/ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R_1 )</td>
<td>21.48</td>
</tr>
<tr>
<td>( R_2 )</td>
<td>24.37</td>
</tr>
<tr>
<td>( R_3 )</td>
<td>25.66</td>
</tr>
<tr>
<td>( R_4 )</td>
<td>21.35</td>
</tr>
<tr>
<td>( R_5 )</td>
<td>21.96</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>1.28 ton/ac.</td>
</tr>
</tbody>
</table>

Crop: Sugarcane. Ref: M.P. 49(43). Site: Govt. Seed and Demonstration Farm, Bilaspur. Type: 'CM'.

Object: To study the interaction of manuring and method of planting on Sugarcane.

1. BASAL CONDITIONS:

(i) (v) to (c) N.A. (ii) (a) Kanker. (b) N.A. (iii) N.A. (iv) (a) N.A. (b) As per treatments. (c) to (g) N.A. (x) 56 lb/ac. of N as cake and 64 lb/ac. of N as Am. (vi) CO312. (vii) Irrigated. (viii) to (x) N.A.

2. TREATMENTS:

Main-plot treatments:

- 2 methods of planting: \( M_1 = \) dry planting and \( M_2 = \) wet planting.

Sub-plot treatments:

- All combinations of (1) and (2)
  
  (1) 2 levels of \( P_2O_5: P_b = 0 \) and \( P_1 = 0 \) lb/ac.
  
  (2) 2 levels of \( K_2O: K_b = 0 \) and \( K_1 = 60 \) lb/ac.

3. DESIGN:

(i) Split-plot. (ii) (a) 2 main-plots/block, 4 sub-plots/main-plot. (b) N.A. (iii) 6. (iv) (a) and (b) 1/4 ac. (v) Nil. (vi) Yes.

4. GENERAL:

(i) and (ii) N.A. (iii) Sugarcane, juice and gur yield. (iv) (a) 1948-1949. (b) and (c) N.A. (vi) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

(i) 28.45 ton/ac.
(ii) 3.58 ton/ac.
(b) 3.37 ton/ac.
(iii) None of the effects is significant.
Crop: Sugarcane. 
Site: Govt. Seed and Demonstration Farm, Bilaspur. 

Object: To find out the optimum interval for irrigation to Sugarcane.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Kanakar. (b) N.A. (iii) 12 to 18.2.1949. (iv) (a) N.A. (b) Wet method of planting.
   (c) and (d) N.A. (e) (v) N.A. (vi) C3. 312. (vii) N.A. (ix) N.A. (x) 7 to 9 3.1950.

2. TREATMENTS:
   3 intervals of irrigation: I1 =10. I2 =23 and I3 =30 days interval.

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 16*/×33'. (v) N.A. (iv) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Yield of sugarcane, juice and gur. (iv) (a) 1948 to 1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 36.35 ton/ac.
   (ii) 7.02 ton/ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of sugarcane in ton/ac.

   Treatment  Av. yield
   1. 40.09
   2. 34.66
   3. 34.29

   S.E./mean = 2.87 ton/ac.

Crop: Linseed. (Rabi).
Site: Institute of Plant Industry, Indore.

Object: To find the optimum manurai dose for Linseed.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) Bakharng. (b) and (c) N.A. (d) 14" between rows. (e) N.A. (v) N.A. (iv) Linseed type 6. (vii) N.A. (viii) Weeding and hoeing.
   (ix) N.A. (x) N.A.

Ref: M.P. 48(44).
Type: 'P'.

Ref: M.P. 48(14).
Type: 'M'.
2. TREATMENTS:
All combinations of (1) and (2)
(1) 3 levels of N as G.N.C.: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac. of N.
(2) 3 levels of P₂O₅ as Super: P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac. of P₂O₅.

3. DESIGN:
(i) 3×3 Fact. in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) N.A. (b) 10'×14'×. (v) N.A. (vi) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Yield of seed and fodder. (iv) (a) to (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) N.A.

5. RESULTS:
(i) 657.9 lb./ac.
(ii) 82.0 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>P₀</td>
<td>661.7</td>
<td>641.3</td>
<td>664.2</td>
</tr>
<tr>
<td>P₁</td>
<td>646.3</td>
<td>631.3</td>
<td>652.2</td>
</tr>
<tr>
<td>P₂</td>
<td>686.7</td>
<td>661.2</td>
<td>673.7</td>
</tr>
</tbody>
</table>

Mean 665.2 663.3 663.2 657.9
S.E. of any marginal mean = 19.33 lb./ac.
S.E. of body of table = 33.48 lb./ac.

Crop: Linseed (Rabi).
Site: Institute of Plant Industry, Indore.
Object: To find the suitable combination of N and P for Linseed.

Ref: M.P. 48(12).
Type: 'M'.
(iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>N₂</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
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<td>P₁</td>
<td>381.5</td>
<td>399.4</td>
<td>393.4</td>
<td>391.4</td>
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<tr>
<td>P₂</td>
<td>393.4</td>
<td>424.8</td>
<td>387.4</td>
<td>401.9</td>
</tr>
<tr>
<td>Mean</td>
<td>373.0</td>
<td>402.4</td>
<td>392.4</td>
<td>389.3</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 13.25 lb./ac.
S.E. of body of table = 22.94 lb./ac.

---

Crop : Linseed.
Site : Institute of Plant Industry, Indore.
Ref. : M.P. 49(20).
Type : ‘M’.

Object :—To study the effect of graded doses of N singly and in combination with different doses of P₂O₅.

1. BASAL CONDITIONS :
   (i) (a) to (c) N.A.
   (ii) (a) Black cotton soil.
   (b) N.A.
   (iii) 3.11.1949.
   (iv) (a) to (c) N.A.
   (d) 14”.
   (e) N.A.
   (f) N.A.
   (g) I.P.I. type 6.
   (h) N.A.
   (v) N.A.
   (vi) N.A.
   (vii) N.A.
   (viii) N.A.
   (ix) and (x) N.A.

2. TREATMENTS :
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S: N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.
   (2) 3 levels of P₂O₅ as Super: P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac.

3. DESIGN :
   (i) 3x3 Fact. in R.B.D.
   (ii) (a) 9.
   (b) N.A.
   (iii) 6.
   (iv) (a) N.A.
   (b) 10’x23’4”.
   (v) N.A.
   (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A.
   (iii) Seed and fodder yield.
   (iv) (a) to (c) N.A.
   (v) (a) and (b) N.A.
   (vi) N.A.
   (vii) The field in which the experiment is laid out is water logged field.

5. RESULTS :
   (i) 425.7 lb./ac.
   (ii) 69.67 lb./ac.
   (iii) None of the effects is significant.
   (iv) Av. yield of linseed in lb./ac.

<table>
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<tr>
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<th>N₂</th>
<th>Mean</th>
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<td>435.2</td>
<td>406.8</td>
<td>435.2</td>
<td>425.7</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 16.42 lb./ac.
S.E. of body of table = 28.44 lb./ac.
Crop: Linseed.
Site: Institute of Plant Industry, Indore.
Object: To study the response of Linseed to the application of N and P_{2}O_{5} singly and in combination.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (b) Black cotton soil (c) N.A. (iii) 30.11.1959. (iv) (a) to (c) N.A. (d) 14' between rows. (e) N.A. (v) N.A. (vi) I.P.I. type 54 (vii) N.A. (viii) Watering: (c) N.A. (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N as A/S: N_{0}=0, N_{1}=20 and N_{2}=40 lb./ac.
   (2) 3 levels of P_{2}O_{5} as Super: P_{0}=0, P_{1}=20 and P_{2}=30 lb./ac.

3. DESIGN:
   (i) 3 x 3 Pact in R.B.D. (ii) (a) 9. (b) N.A. (iii) 6. (iv) (a) 35' x 14'. (b) 10' 4" x 0'. (v) 2' 4" x 2'. (vi) Yes.

4. GENERAL:
   (i) N.A. (ii) N.A. (iii) Weight of seed and fodder. (iv) (a) to (c) N.A. (v) (a) N.A. (b) N.A. (c) Hill.
   (vii) The field in which this experiment is laid out is a rich field.

5. RESULTS:
   (i) 305 3 lb./ac.
   (ii) 49 9 lb./ac.
   (iii) Main effects of N and P and their interaction are significant.
   (iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
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<th>N_{1}</th>
<th>N_{2}</th>
<th>N_{3}</th>
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<td>P_{0}</td>
<td>428.0</td>
<td>530.2</td>
<td>488.0</td>
<td>483.0</td>
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<td>519.0</td>
<td>525.0</td>
<td>558.5</td>
<td>531.5</td>
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<tr>
<td>P_{2}</td>
<td>495.0</td>
<td>484.5</td>
<td>527.0</td>
<td>520.5</td>
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</tbody>
</table>

Mean: 481.0 535.5 519.5 508.3

S.E. of any marginal mean = 11.62 lbs/ac.
S.E. of body of table = 20.1 lbs/ac.
5. RESULTS:
(i) 316.8 lb./ac.
(ii) 43.12 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of seed in lb./ac.

<table>
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<tr>
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<td>307.6</td>
<td>312.1</td>
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<td>313.5</td>
<td>320.8</td>
<td>321.6</td>
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<td>Mean</td>
<td>315.0</td>
<td>318.7</td>
<td>316.8</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 12.45 lb./ac.
S.E. of body of table = 17.60 lb./ac.

Crop :- Linseed.
Site :- Institute of Plant Industry, Indore.

Ref :- M.P. 50(3).
Type :- 'M'.

Object :- To study the response of N and P singly and in combination on the yield of Linseed.

1. BASAL CONDITIONS :
(i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.10.1950. (iv) (a) to (c) N.A.

2. TREATMENTS :
All combinations of (1) and (2)
(1) 2 levels of N as A/S: N₀ = 0 and N₁ = 20 lb./ac.
(2) 2 levels of P₀₂ as Super: P₀ = 0 and P₁ = 20 lb./ac.

3. DESIGN :
(i) 2 x 2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 35'8' x 15'. (b) 30'8' x 10'. (v) 2 Y around.
(vi) Yes.

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

5. RESULTS:
(i) 409.6 lb./ac.
(ii) 51.74 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of seed in lb./ac.

<table>
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<tr>
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<td>431.8</td>
<td>415.6</td>
<td>423.7</td>
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<tr>
<td>P₀</td>
<td>372.7</td>
<td>418.5</td>
<td>395.6</td>
</tr>
<tr>
<td>Mean</td>
<td>402.3</td>
<td>417.0</td>
<td>409.6</td>
</tr>
</tbody>
</table>

S.E. of any marginal mean = 14.93 lb./ac.
S.E. of body of table = 21.12 lb./ac.
Crop: - Linseed (Rabi).
Site: - Institute of Plant Industry, Indore.

Object: - To study the effect of treating seed in different nutrients before sowing on the yield of Linseed.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 9.11.1949. (iv) (a) Blackwet. (b) and (c) N.A. (d) 1'" between rows. (e) N.A. (f) N.A. (g) I.P.I. type 5. (h) N.A. (i) Weeding: 4 and (a) N.A.

2. TREATMENTS:
   1. Dry seed (control).
   2. Seed soaked in pure water.
   3. Seed soaked in A/S solution (one molar solution).
   5. Seed soaked in Potassium Phosphate solution.

3. DESIGN:
   (i) R.B.D. (ii) 5. (b) N.A. (iii) 5. (iv) (a) 59' × 9' 4". (b) 45' × 4' 9". (c) 2 rows on both sides and 2' of each row at both ends. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Weight of seed and fodder. (iv) (a) N.A. (v) 1949. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Germination in Ammo. Phos. solution treatment was poor. (vii) Nil.

5. RESULTS:
   (i) 528.3 lb./ac.
   (ii) 528.3 lb./ac.
   (iii) Treatment differences are highly significant.
   (iv) Av. yield of seed in lb./ac.
   Treatment | Av. yield
   1. | 585.3
   2. | 575.0
   3. | 567.2
   4. | 326.3
   5. | 587.9
   S.E.(mean) = 37.03 lb./ac.

Crop: - Linseed.
Site: - Institute of Plant Industry, Indore.

Object: - To study the effect of graded doses of N on the performance of different Linseed varieties.

1. BASAL CONDITIONS:
   (i) (a) Nil. (b) Sannhemp. (c) Green manuring with sannhemp. (ii) (a) Black cotton soil. (b) N.A. (iii) 30.9.1952. (iv) (a) and (b) N.A. (c) 20 lb./ac. (d) and (e) N.A. (x) Nil. (vii) As per treatments. (viii) Unirrigated. (viii) Nil. (ix) 2.7". (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 4 levels of N as A:S: N0 =0, N1 =20, N2 =40 and N3 =60 lb./ac.

3. DESIGN:
   (i) 4 × 4 Fact. in R.B.D. (ii) 15. (b) N.A. (iii) 4. (iv) (a) 59' × 4' 9". (b) 45' × 9'. (v) 2. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) Attacked by wilt. Details N.A. (iii) Linseed yield. (iv) (a) and (b) Nil. (v) (a) and (b) N.A. (vi) Nil. (vii) Nil.

5. RESULTS:
   (i) 229.2 lb./ac.
   (ii) 72.2 lb./ac.
   (iii) Only V effect is significant.
(iv) Av. yield of linseed in lb./ac.

<table>
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<tr>
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<th>N₂</th>
<th>N₃</th>
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<td>225.3</td>
<td>186.9</td>
<td>219.1</td>
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<td>V₂</td>
<td>143.1</td>
<td>213.7</td>
<td>200.3</td>
<td>233.8</td>
<td>197.7</td>
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<td>V₃</td>
<td>252.0</td>
<td>174.7</td>
<td>230.5</td>
<td>264.1</td>
<td>230.3</td>
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<td>268.8</td>
<td>297.7</td>
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<td>Mean</td>
<td>206.0</td>
<td>226.5</td>
<td>238.5</td>
<td>215.9</td>
<td>229.2</td>
</tr>
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</table>

S.E. of any marginal mean = 18.05 lb./ac.
S.E. of body of table = 36.1 lb./ac.

---

Crop: Linseed.
Site: Institute of Plant Industry, Indore.

Object:—To study the effect of graded doses of N on the performance of different Linseed varieties.

1. BASAL CONDITIONS:
 (i) (a) No. (b) Sann as G.M. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 22.10.1953. (iv) (a) 3 bakharings. (b) Drilled. (c) N.A. (d) Rows 14' apart. (e) N.A (v) N.A. (vi) As per treatments (vii) Unirrigated. (viii) N.A. (ix) 2.57". (x) 24.2.1954 to 4.3.1954.

2. TREATMENTS:
Main-plot treatments:
4 varieties : V₁=T-6, V₂=T-11, V₃=C P F-55 and V₄=T-65.

Sub-plot treatments:
All combinations of (1) and (2)
(1) 4 levels of N as A/S: N₀=0, N₁=20, N₂=40 and N₃=60 lb./ac.
(2) 3 levels of P₄O₁₆ as Super : P₀=0, P₁=15 and P₄=30 lb./ac.

3. DESIGN:
(i) Split-plot. (ii) (a) 4 main-plots/replication and 12 sub-plots/main-plot. (b) N.A. (iii) 3. (iv) (a) 40'x14'. (b) 35'x9'-4". (v) 2 rows on each side and 2' at each end. (vi) Yes.

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

5. RESULTS:
(i) 457 lb./ac.
(ii) 163.04 lb./ac.
(iii) 77.70 lb./ac.
(iv) None of the effects is significant.
(v) Av. yield of linseed in lb./ac.

<table>
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<th>N₂</th>
<th>N₃</th>
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<td>458</td>
<td>492</td>
<td>493</td>
<td>472</td>
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<tr>
<td>V₂</td>
<td>469</td>
<td>474</td>
<td>407</td>
<td>519</td>
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<tr>
<td>V₃</td>
<td>432</td>
<td>443</td>
<td>434</td>
<td>472</td>
<td>445</td>
</tr>
<tr>
<td>V₄</td>
<td>459</td>
<td>439</td>
<td>461</td>
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<td>449</td>
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<tr>
<td>Mean</td>
<td>446</td>
<td>453</td>
<td>449</td>
<td>481</td>
<td>457</td>
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</table>

P₀  | P₁  | P₄  |
-----|-----|-----|
456 | 419 | 463 |
453 | 485 | 487 |
430 | 456 | 492 |
S.E. of difference of two

1. V marginal means = 38.43 lb./ac. 6. V means at the same level of N = 49.8 lb./ac.
2. N marginal means = 18.31 lb./ac. 5. P means at the same level of V = 31.72 lb./ac.
3. P marginal means = 15.86 lb./ac. 7. V means at the same level of P = 46.34 lb./ac.
4. N means at the same level of V = 36.62 lb./ac. 8. means in the body of N x P table = 31.72 lb./ac.

---

Crop: Linseed. Ref: M.P. 48(27).
Site: Govt. Exptl. Farm, Powarkheda. Type: 'CM'.

Object: To compare the out-turn of linseed with different spacings, seed rates and doses of N.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Clay loam (mariyar). (b) Refer soil analysis, Powarkheda. (iii) N.A. (iv) (a) N.A. (b) Sown by tilfan. (c) and (d) As per treatments. (e) N.A. (vi) E.B III. (vii) to (ix) N.A.

2. TREATMENTS:
All combinations of (1), (2) and (3):
1. 3 spacings: S1 = 9", S2 = 12" and S3 = 15" between rows.
2. 3 seed rates: R1 = 12, R2 = 16 and R3 = 20 lb./ac.
3. 3 levels of N as A/S: N0 = 0, N1 = 15 and N2 = 30 lb./ac.

3. DESIGN:
(i) 3² conf.d. (ii) 9 plots/block; 3 blocks replication. (b) N.A. (iii) 2. (iv) (a), (b) 15 x 72 ft. (v) Nil. (vii) Yes.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Grain and bhusa yield. iv) a) 1946 to 1950. (b) N.A. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) The layout was not available, hence the exp. analysed as R.B.D.

5. RESULTS:
(i) 59.3 lb./ac.
(ii) 106.6 lb./ac.
(iii) Only N effect is highly significant.
(iv) av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
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<td>774.9</td>
<td>793.7</td>
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<tr>
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<td>849.5</td>
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<td>817.9</td>
<td>830.6</td>
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<td>791.9</td>
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<tr>
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<td>764.7</td>
<td>753.7</td>
<td>759.3</td>
<td>754.2</td>
<td>764.2</td>
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</table>

S.E. of any marginal mean = 25.13 lb./ac.
S.E. of body of table = 45.52 lb./ac.

---

Crop: Linseed. Ref: M.P. 49(35).
Site: Govt. Exptl. Farm, Powarkheda. Type: 'CM'.

Object: To compare the out-turn of linseed EB III with different spacings, seed rates and doses of N.

1. BASAL CONDITIONS:
(i) (a) to (c) N.A. (ii) (a) Clay loam (mariyar). (b) Refer soil analysis, Powarkheda. (iii) 30.31.11.1049.
(iv) (a) N.A. (b) Sown by tilfan. (c) to (e) N.A. (vi) E.B III. (vii) to (ix) N.A. (x) 11-3-1950.
2. TREATMENTS:

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

(1) 3 spacings: $S_1 = 9\text{"}$, $S_2 = 12\text{"}$ and $S_3 = 15\text{"}$ between rows.
(2) 3 seed rates: $R_1 = 12\text{ lb./ac.}$, $R_2 = 16\text{ lb./ac.}$ and $R_3 = 20\text{ lb./ac.}$
(3) 3 levels of N as A/S: $N_0 = 0$, $N_1 = 15$ and $N_2 = 30\text{ lb./ac. of N.}$

3. DESIGN:

(i) $3^3$ confounded factorial. (ii) (a) 9 plots/block and 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a) and (b) $15' \times 72.7'$. (v) Margin between plots 2', margin between blocks 3' and margin between replications 12'. No guard rows left. (vi) Yes.

4. GENERAL:

(i) N.A. (ii) N.A. (iii) Linseed and blue yield, (iv) (a) 1946 to 1950. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) N.A. (vii) Nil.

5. RESULTS:

(i) 530.2 lb./ac.
(ii) 73.44 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of seed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>$S_1$</th>
<th>$S_2$</th>
<th>$S_3$</th>
<th>Mean</th>
<th>$R_1$</th>
<th>$R_2$</th>
<th>$R_3$</th>
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<td>539.4</td>
<td>549.0</td>
<td>546.9</td>
<td>529.8</td>
<td>551.9</td>
<td>559.0</td>
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<tr>
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<td>496.0</td>
<td>513.6</td>
<td>507.7</td>
<td>505.8</td>
<td>492.6</td>
<td>497.7</td>
<td>526.9</td>
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<tr>
<td>$N_2$</td>
<td>513.5</td>
<td>546.5</td>
<td>553.5</td>
<td>537.8</td>
<td>535.2</td>
<td>538.1</td>
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<tr>
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<td>533.2</td>
<td>536.7</td>
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<tr>
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<td>543.6</td>
<td>527.7</td>
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<tr>
<td>$R_3$</td>
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<td>538.1</td>
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</table>

S.E. of any marginal mean = 17.31 lb./ac.
S.E. of body of table = 29.98 lb./ac.

Crop : Linseed.
Site : Govt. Exptl. Farm, Powarkheda.
Ref : M.P. 50(35).
Type : ‘CM’.

Object : To compare the effect of different spacings, seed rates and doses of N on the out-turn of Linseed.

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) Clay loam (Mariyar), (b) Refer soil analysis, Powarkheda. (iii) 26, 27.10.1950.
(iv) (a) N.A. (b) Sown by tiffan. (c) to (e) N.A. (v) N.A. (vi) E.B. III. (vii) N.A. (viii) N.A. (x) 2.11°. (x) 28.3.1951.

2. TREATMENTS:

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

(1) 3 spacings: $S_1 = 9\text{"}$, $S_2 = 12\text{"}$ and $S_3 = 15\text{"}$ between rows.
(2) 3 seed rates: $R_1 = 12\text{ lb./ac.}$, $R_2 = 16\text{ lb./ac.}$ and $R_3 = 20\text{ lb./ac.}$
(3) 3 levels of N as A/S: $N_0 = 0$, $N_1 = 15$ and $N_2 = 30\text{ lb./ac. of N.}$

3. DESIGN:

(i) $3^3$ confounded factorial. (ii) (a) 9 plots/block; 3 blocks/replication. (b) N.A. (iii) 2. (iv) (a), (b) $15' \times 72.7'$. (v) Margin between plots 2', margin between blocks 3' and margin between replications 12'. (vi) Yes.
4. GENERAL:
(i) Good. (ii) N.A. (iii) Linseed and bhusa yield. (iv) (a) 1946 to 1950. (b) N.A. (c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 531 lb./ac.
(ii) 106.6 lb./ac.
(iii) None of the effects is significant.
(iv) Av. yield of linseed in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>S1</th>
<th>S2</th>
<th>S3</th>
<th>Mean</th>
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<th>R2</th>
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<td>515</td>
<td>531</td>
<td>521</td>
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</table>

S.E. of any marginal mean = 25.14 lb./ac.
S.E. of body of tables = 43.14 lb./ac.

Crop :- Groundnut.
Site :- Central Res. Farm, Gwalior.
Ref :- M.P. 50(51).
Type :- 'M'.

Object :- To study the effect of Super on the yield of Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Wheat. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 28.7.1950.
(iv) (a) Ploughing by sabai plough. (b) Sown by 2 coulted seed drill. (c) 18” between rows. (d) 2
between rows. (e) —. (v) N.A. (vi) A.H. 334. (vii) Unirrigated. (viii) N.A. (ix) 27.76’. (x) N.A.

2. TREATMENTS:
4 levels of P₂O₅: P₀=0, P₁=10, P₂=20 and P₃=30 lb./ac.
P₂O₅ as Super drilled in furrows before sowing.

3. DESIGN:
(i) R.B.D. (ii) (a) 4. (b) 84’×96’. (iii) 6. (iv) (a) 21’×96’. (b) 12’×90’. (v) 4.5’×3’. (vi) Yes.

4. GENERAL:
(i) Poor. (ii) N.A. (iii) Percentage germination, weight of groundnut pods. (iv) (a) 1950 to 1951. (b) N.A.
(c) N.A. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 798.3 lb./ac.
(ii) 186.2 lb./ac.
(iii) Treatment differences are not significant.
(iv) Av. yield of pod in lb./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>P₀</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>S.E./mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. yield</td>
<td>765.5</td>
<td>844.1</td>
<td>757.6</td>
<td>826.0</td>
<td>=76.02 lb./ac.</td>
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</tbody>
</table>
Crop: Groundnut.
Site: Central Res. Farm, Gwalior.

Object: To study the effect of Super on the yield of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) N.A. (b) Sugarcane. (c) N.A. (ii) (a) Sandy loam. (b) Refer soil analysis, Gwalior. (iii) 30.7.1951. (iv) (a) Subsurface ploughing. (b) and (c) N.A. (d) 18" between rows. (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) Interculturing by Mayflower cultivator on 31.8.1951. Weeding between 22.8.1951 to 29.8.1951. (ix) N.A. (x) 12 to 19.1.1952.

2. TREATMENTS:
   4 levels of P<sub>2</sub>O<sub>5</sub> : P<sub>0</sub> = 0, P<sub>1</sub> = 10, P<sub>2</sub> = 20 and P<sub>3</sub> = 30 lb./ac.
P<sub>2</sub>O<sub>5</sub> as Super drilled in furrows before sowing.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 21'×96'. (b) 12'×90'. (v) 4.5'×3'. (vi) Yes.

4. GENERAL:
   (i) Poor due to insufficient rains. (ii) Crop damaged by white ants and crows. (iii) Groundnut pod yield.
   (iv) (a) 1950 – N.A. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 396.1 lb./ac.
   (ii) 122.2 lb./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. yield of pod in lb./ac.
   \[
   \begin{array}{|c|c|}
   \hline
   \text{Treatment} & \text{Av. yield} \\
   \hline
   P<sub>0</sub> & 387.6 \\
   P<sub>1</sub> & 357.7 \\
   P<sub>2</sub> & 420.8 \\
   P<sub>3</sub> & 418.3 \\
   \hline
   \text{S.E.}/\text{mean} & \pm 49.89 \text{ lb./ac.} \\
   \hline
   \end{array}
   \]

Crop: Groundnut.
Site: Institute of Plant Industry, Indore.

Object: To find the response of Groundnut to P<sub>2</sub>O<sub>5</sub> as Super and G.N.C. singly and in combination.

1. BASAL CONDITIONS:
   (i) (a) No. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 16.7.1959. (iv) (a) to (e) N.A. (v) N.A. (vi) AK 24. (vii) Unirrigated. (viii) and (ix) N.A. (x) 8.11.1950.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 2 levels of N as G.N.C. : N<sub>0</sub> = 0 and N<sub>1</sub> = 20 lb./ac.
   (2) 2 levels of P<sub>2</sub>O<sub>5</sub> as Super : P<sub>0</sub> = 0 and P<sub>3</sub> = 30 lb./ac.

3. DESIGN:
   (i) 2×2 Fact. in R.B.D. (ii) (a) 4. (b) N.A. (iii) 6. (iv) (a) 28'6"×19'8". (b) 23'6"×16'. (v) 2' on either side and 1'10" at the ends. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) No. (ii) Pod yield. (iv) (a) and (b) No. (c) N.A. (v) (a) No. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 649.7 lb./ac.
   (ii) 73.84 lb./ac.
   (iii) Levels of P and N are highly significant. Interaction is not significant.
(iv) Av. yield of groundnut in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>N₀</th>
<th>N₁</th>
<th>Mean</th>
</tr>
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<tbody>
<tr>
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<td>604.1</td>
<td>555.4</td>
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<tr>
<td>P₁</td>
<td>686.6</td>
<td>801.4</td>
<td>744.0</td>
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</table>

Mean          596.6          702.8          649.7

S.E. of any marginal mean             -23.32 lb./ac.
S.E. of body of table                 -30.14 lb./ac.

Crop: Groundnut.
Site: Institute of Plant Industry, Indore.

Object: To find out the effect of application of N, P₂O₅ and compost in various combinations on the yield of Groundnut.

1. BASAL CONDITIONS:
   (a) (a) N.A. (b) Wheat. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) 1.6.1951. (iv) (a) Balhauria.
   (b) and (c) N.A. (d) 14" between rows. (e) N.A. (vi) AK-12-24. (vii) N.A. (viii) Weeding and thinning on 6.7.1951. (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1), (2) and (3)
   (1) 2 levels of Farm compost: F₀ = 0 and F₁ = F. Compost (quantity—N.A.)
   (2) 2 levels of N as A/S: N₀ = 0 and N₁ = 2 lb./ac. of N.
   (3) 2 levels of P₂O₅ as Super: P₀ = 0 and P₁ = 2 lb./ac. of P₂O₅.

3. DESIGN:
   (i) 2³ Fact. in R.B.D. (ii) (a) 8. (b) N.A. (iii) 6. (iv) (a) 28' x 14'. (b) 23' x 10', (c) 24' x 2'. (c) Yet.

4. GENERAL:
   (i) and (ii) N.A. (iii) Ped yield. (iv) (a) 1951—N.A. (b) and (c) N.A. (v) (a) and (b) N.A.
   (vi) Similar experiment was laid out during 1949-1950. During 1951 the experiment was replanned. (vii) The experiment was laid out with jowar and cotton with the same purpose and same treatments in the form of strip plot design. Hence randomisation is not done independently for each crop.

5. RESULTS:
   (i) 1338 lb./ac.
   (ii) 190.0 lb./ac.
   (iii) Only main effect of N is significant.
   (iv) Av. yield of groundnut in lb./ac.

<table>
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S.E. of any marginal mean             =38.79 lb./ac.
S.E. of body of table                 =54.85 lb./ac.
Crop :- Groundnut.  
Site :- Institute of Plant Industry, Indore. 
Object :- To study the effect of application of N and P₂O₅ singly and in combination on the yield of Groundnut.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) N.A.  (iv) (a) to (c) N.A.  (d) Rows 14" apart.  
   (e) N.A.  (v) to (vii) N.A.  (viii) Weeding.  (ix) and (x) N.A.

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as G.N.C. : N₀ = 0, N₁ = 20 and N₂ = 40 lb./ac.  
   (2) 3 levels of P₂O₅ as bone char : P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac. of P₂O₅.

3. DESIGN:
   (i) 3 x 3 Fact. in R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) 15' x 35'.  (b) 10' x 30'4".  (v) 2' 4' x 2.5'.  (vi) Yes.

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

5. RESULTS:
   (i) 399.9 lb./ac.  
   (ii) 93.48 lb./ac.  
   (iii) None of the effects is significant.  
   (iv) Av. yield of grain in lb./ac.

<table>
<thead>
<tr>
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<th>N₂</th>
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<td>420.7</td>
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<td>P₂</td>
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<td>377.2</td>
<td>404.2</td>
<td>389.7</td>
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<td>Mean</td>
<td>399.2</td>
<td>381.7</td>
<td>418.7</td>
<td>399.9</td>
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</table>

S.E. of any marginal mean = 22.03 lb./ac.  
S.E. of body of table = 38.16 lb./ac.

Crop :- Groundnut.  
Site :- Institute of Plant Industry, Indore.  
Object :- To find the effect of N and P₂O₅ singly and in combination on Groundnut.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Black cotton soil.  (b) N.A.  (iii) 3.7.1949.  (iv) (a) Bakhoring.  (b) to (c) N.A.  

2. TREATMENTS:
   All combinations of (1) and (2)
   (1) 3 levels of N as A/S : N₀ = 0, N₁ = 20 and N₂ = 40 lb.·ac. of N.  
   (2) 3 levels of P₂O₅ as Super : P₀ = 0, P₁ = 20 and P₂ = 40 lb./ac. of P₂O₅.

3. DESIGN:
   (i) 3 x 3 Fact. in R.B.D.  (ii) (a) 9.  (b) N.A.  (iii) 6.  (iv) (a) 14' x 35'.  (b) 10' x 30'4".  (v) 2' 4' x 2'.  (vi) Yes.

4. GENERAL:
   (i) Good (ii) N.A.  (iii) Weight of groundnut and fodder.  (iv) (a) to (c) N.A.  (v) (a) N.A.  (b) N.A.  
   (vi) and (vii) Nil.
5. RESULTS:
(i) 1297 lb./ac.
(ii) 167.1 lb./ac.
(iii) Only levels of N are highly significant.
(iv) Av. yield of groundnut in lb./ac.

<table>
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<tr>
<th>Treatment</th>
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<th>N₂</th>
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<td>1294</td>
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Mean 1183, 1357, 1356, 1297

S.E. of any marginal mean = 39.39 lb./ac.
S.E. of body of table = 68.22 lb./ac.

Crop: Groundnut.
Site: Institute of Plant Industry, Indore.
Ref: M.P. 53(99).
Type: 'M'.

Object: To find out the residual effect of trace elements on the yield of Groundnut.

1. BASAL CONDITIONS:
(i) (a) Nil. (b) Cotton. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) N.A. (ix) N.A. (x) N.A.

2. TREATMENTS:
1. Control (no treatment).
2. Cu₁ = Copper at 18 lb./ac.
3. Cu₂ = Copper at 36 lb./ac.
4. B₁ = Boron at 5 lb./ac.
5. B₂ = Boron at 10 lb./ac.
6. Mn₁ = Manganese at 25 lb./ac.
7. Mn₂ = Manganese at 50 lb./ac.
8. Zn₁ = Zinc at 13 lb./ac.
9. Zn₂ = Zinc at 30 lb./ac.
10. Cr₁ = Chromium at 5 lb./ac.
11. Cr₂ = Chromium at 10 lb./ac.

3. DESIGN:
(i) R.B.D. (ii) (a) 11. (b) N.A. (iii) 8. (iv) (a) N.A. (b) 5'×32'. (v) N.A. (vi) N.A.

4. GENERAL:
(i) N.A. (ii) N.A. (iii) Pod yield. (iv) (a) N.A. (b) Yes. (c) No. (v) (a) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
(i) 875.3 lb./ac.
(ii) 89.91 lb./ac.
(iii) Residual effect of trace elements is not significant.
(iv) Av. yield of groundnut in lb./ac.

<table>
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<tr>
<th>Treatment</th>
<th>Av. yield</th>
<th>Treatment</th>
<th>Av. yield</th>
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<td>2.</td>
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<td>8.</td>
<td>877</td>
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<td>5.</td>
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<td>146</td>
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<td>6.</td>
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S.E./mean = 31.75 lb./ac.
Crop: groundnut (Kharif).  
Site: Institute of Plant Industry, Indore.  
Ref: M.P. 51(17).  
Type: 'C'.

Object: To find out optimum seed rate for groundnut under local conditions.

1. BASAL CONDITIONS:
   (i) (a) N.A.  (b) Jowar  (c) Nil.  
   (ii) (a) Black cotton soil  (b) Nil.  
   (iii) 3.7.1951.  (iv) (a) Bakharing.  (b) N.A.  
   (v) As per treatments.  (d) 14' between rows.  (e) N.A.  
   (vi) N.A.  (x) N.A.

2. TREATMENTS:
   4 seed rates: R₁ = 40, R₂ = 60, R₃ = 80 and R₄ = 100 lb./ac.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4 (b) 50'×93' 4'. (iii) 8.  
   (iv) (a) 50'×23' 4'. (b) 45'×18' 8'. (v) 2'4"×2.5'. (vi) Yes.

4. RESULTS:
   (i) 780 lb./ac.  (ii) 1300 lb./ac.  
   (iii) Treatment differences are not significant.

   Av. yield of groundnut in lb./ac.
   Treatment    Av. yield
   R₁            766
   R₂            829
   R₃            748
   R₄            776
   S.E./mean = 45.96 lb./ac.

Crop: Jowar and Arhar (Kharif).  
Site: Central Res. Farm, Gwalior.  
Ref: M.P. 53(73).  
Type: 'X'.

Object: To find out suitable ratio of mixture of Jowar and Arhar which will give maximum returns.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A.  (ii) (a) Sandy loam.  
   (ii) 23.7.1953.  (iv) (a) N.A.  
   (b) Seeds of both crops drilled.  (c) As per treatments.  
   (d) Usually 18'.  (e) N.A.  
   (v) N.A.  (vi) Jowar G-12-2 (main season variety)  
   (vii) Unirrigated.  (viii) N.A.  
   (ix) 18.06'.  (x) Date of maturity of jowar 30.1.1953.  
   and Arhar 12.3.1954.

2. TREATMENTS:
   1. Jowar alone at 6 lb./ac.  
   2. Arhar alone at 16 lb./ac.  

3. DESIGN:
   (i) R.B.D. (ii) (a) 6.  (b) N.A.  (iii) 4.  
   (iv) (a) N.A.  
   (b) 96'×12'. (v) N.A.  
   (vi) Yes.

4. GENERAL:
   (i) N.A.  (ii) N.A.  
   (iii) Av. yield of Jowar and Arhar grains in lb./ac.  
   (iv) (a) 1952 to 1953.  (b) No.  
   (c) N.A.  
   (v) Jowar and Arhar  
   and (vi) and (vii) Analysed on the basis of money value in Rs./plot.

5. RESULTS:
   (i) 63.27 Rs./ac.  
   (ii) 19.16 Rs./ac.  
   (iii) Treatments do not differ significantly.
Crop: Groundnut and Cotton.
Site: Institute of Plant Industry, Indore.

Object: To find out the best way of intercropping Groundnut and Cotton for getting the maximum return.

1. BASAL CONDITIONS:
   (i) (a) No. (b) Jawar. (c) 20 lb./ac. of N as a mixture of A/S and G.N.C. (ii) (a) Black cotton soil. (b) N.A. (iii) 25.6.1952. (iv) (a) to (c) N.A. (v) N.A. (vi) Cotton Dhar 43 (Ekrl; Groundnut A.K. 12.24. (vii) Unirrigated. (viii) and (ix) N.A. (x) Cotton pickings on 7.11.1952, and 24.1.1953.

2. TREATMENTS:
   1. Two rows of cotton with 6 rows of groundnut.
   2. Two rows of cotton with 14 rows of groundnut.
   3. Control (with two rows of groundnut).

3. DESIGN:
   (i) R.B.D. (ii) (a) 3. (b) N.A. (iii) 6. (iv) (a) and (b) 55' x 112'. (v) No. (vi) Yes.

4. GENERAL:
   (i) Good. (ii) No. (iii) Groundnut and cotton yield. (iv) 5a) 1952 to 1956. (b) No. (c) N.A. (vi) N.A. (b) N.A. (vi) and (vii) Nil.

5. RESULTS:
   (i) 230.6 Rs./ac.
   (ii) 35.79 Rs./ac.
   (iii) Treatment differences are not significant.
   (iv) Av. value of yield in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>226.5</td>
</tr>
<tr>
<td>2.</td>
<td>238.3</td>
</tr>
<tr>
<td>3.</td>
<td>227.0</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>=14.61 Rs./ac.</td>
</tr>
</tbody>
</table>

---

Crop: Wheat and Gram.
Site: Adhartal Farm, Jabalpore.

Object: To compare sowing methods of Birra.

1. BASAL CONDITIONS:
   (i) (a) to (c) N.A. (ii) (a) Kabar (heavy soil). (b) Kharif. (iii) 7.11.1955. (iv) (a) N.A. (b) Drilled. (c) As per treatment. (d) and (e) N.A. (v) N.A. (vi) Wheat A.O. 90 and Gram Adh. 7. (vii) to (x) N.A.

2. TREATMENTS:
   1. Wheat alone at 80 lb./ac.
   2. Gram alone at 80 lb./ac.
   3. Sowing wheat and gram together in the same row each with seed rate at 40 lb./ac.
4. Sowing wheat and gram together in the same row each with seed rate of 80 lb./ac.
5. Sowing wheat and gram separately in cross directions each with seed rate of 40 lb./ac.
6. Sowing wheat and gram separately in cross directions each with seed rate of 80 lb./ac.

3. DESIGN:
(i) R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 15'×40'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) and (ii) N.A.  (iii) Grain and straw yield for both gram and wheat.  (iv) (a) to (c) N.A.  (v) (a) and (b) N.A.  (vi) Nil.  (vii) In between two plots 1½' space was left where 1 row of linseed was grown. Farm harvest prices for Jabalpore district for the year 1951-52 have been taken in working out the money values. Wheat at Rs. 16.00/md. while Gram at Rs. 14.50/md.

5. RESULTS:
(i) 55.64 Rs./ac.
(ii) 14.70 Rs./ac.
(iii) Treatment differences are not significant.
(iv) Av. value of grain in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>55.80</td>
</tr>
<tr>
<td>2.</td>
<td>46.70</td>
</tr>
<tr>
<td>3.</td>
<td>55.80</td>
</tr>
<tr>
<td>4.</td>
<td>62.20</td>
</tr>
<tr>
<td>5.</td>
<td>54.82</td>
</tr>
<tr>
<td>6.</td>
<td>58.32</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>6.00 Rs./ac.</td>
</tr>
</tbody>
</table>

Crop :- Wheat and Gram.  
Site :- Govt. Exptl. Farm, Powarkheda.  
Ref :- M.P. 50(29).  
Type :- 'X'.

Object :- To compare the two methods of sowing बिन्हा (Wheat and Gram together).

1. BASAL CONDITIONS:
(i) (a) to (c) N.A.  (ii) (a) Clay loam (mariyar).  (b) Refer soil analysis, Powarkheda.  (iii) 24.10.1950.  (iv) (a) Bakharing.  (b) and (c) As per treatments.  (d) 12'.  (e) N.A.  (v) N.A.  (vi) Gram Ad. V ; Wheat A-115 (local).  (vii) Unirrigated.  (viii) Nil.  (ix) 2.11'.  (x) 25.3.1951.

2. TREATMENTS:
1. Wheat alone at 80 lb./ac.
2. Gram alone at 80 lb./ac.
3. Sowing wheat and gram together in the same row each with seed rate of 40 lb./ac.
4. Sowing wheat and gram together in the same row each with seed rate of 80 lb./ac.
5. Sowing wheat and gram separately in cross direction each with seed rate of 40 lb./ac.
6. Sowing wheat and gram separately in cross direction each with seed rate of 80 lb./ac.

3. DESIGN:
(i) R.B.D.  (ii) (a) 6.  (b) N.A.  (iii) 6.  (iv) (a) and (b) 30'×40'.  (v) Nil.  (vi) Yes.

4. GENERAL:
(i) and (ii) N.A.  (iii) Grain yield.  (iv) (a) 1950 to 1953.  (b) No.  (c) N.A.  (v) (a) and (b) N.A.  (vi) Nil.  (vii) Farm harvest prices for Hoshangabad district for the year 1950—1951 have been taken in working out money value : Wheat at Rs. 18.50/md. and Gram at Rs. 11.69/md.

5. RESULTS:
(i) 104.22 Rs./ac.
(ii) 18.32 Rs./ac.
(iii) Treatment differences are highly significant.
Crop: Wheat and Gram.  
Site: Govt. Exptl. Farm, Powarkheda.  
Ref.: M.P. 51(60).  
Type: 'X'.

Object: To compare the two methods of sowing Birra (Wheat and Gram together).

1. BASAL CONDITIONS:
   - (i) (a) to (c) N.A.  
   - (ii) (a) Clay loam (Marwari).  
   - (iii) Refer soil analysis, Powarkheda.  
   - (iv) (a) Bakharing, (b) Drilling.  
   - (c) As per treatments.  
   - (d) N.A.  
   - (e) N.A.  
   - (f) Gram A-115 (local).  
   - (g) Wheat A-115 (local).  
   - (h) Unirrigated.  
   - (i) Nil.  
   - (j) Yes.

2. TREATMENTS:
   - (i) Wheat alone at 80 lb./ac.  
   - (ii) Gram alone at 80 lb./ac.  
   - (iii) Wheat and gram sown together in the same row each with seed rate at 40 lb./ac.  
   - (iv) Wheat and gram sown together in the same row each with seed rate at 80 lb./ac.  
   - (v) Wheat and gram sown in cross directions each with seed rate at 40 lb./ac.  
   - (vi) Wheat and gram sown in cross directions each with seed rate at 80 lb./ac.

3. DESIGN:
   - (i) R.B.D.  
   - (ii) 6.  
   - (iii) 6.  
   - (iv) (a) and (b) 3" x 4'.  
   - (v) Nil.  
   - (vi) Yes.

4. GENERAL:
   - (i) and (ii) N.A.  
   - (iii) Grain yield.  
   - (iv) (b) 1931—1951.  
   - (v) and (c) N.A.  
   - (vi) The season was most unfavourable for the crop. The yield of both gram and wheat was too poor.  
   - (vii) Farm harvest prices for the year 1951—1952 for Hoshangabad district have been taken in working out this money value. Wheat at Rs. 16.25/mt, and gram at Rs. 9.54/mt.

5. RESULTS:
   - (i) 38.37 Rs./ac.  
   - (ii) 11.25 Rs./ac.  
   - (iii) Treatment differences are highly significant.

   Treatment: Av. yield of grain in Rs./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>45.43</td>
</tr>
<tr>
<td>2.</td>
<td>19.78</td>
</tr>
<tr>
<td>3.</td>
<td>39.08</td>
</tr>
<tr>
<td>4.</td>
<td>46.83</td>
</tr>
<tr>
<td>5.</td>
<td>33.88</td>
</tr>
<tr>
<td>6.</td>
<td>47.37</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>= 4.60 Rs./ac.</td>
</tr>
</tbody>
</table>

Crop: Wheat and Gram.  
Site: Govt. Exptl. Farm, Powarkheda.  
Ref.: M.P. 52(42).  
Type: 'X'.

Object: To compare the two methods of sowing Birra.

1. BASAL CONDITIONS:
   - (i) (a) to (e) N.A.  
   - (ii) (a) Clay loam (Marwari).  
   - (iii) 25.10.1952.  
   - (iv) (a) Bakharing, (b) Drilling.  
   - (c) As per treatments.  
   - (d) 12'.  
   - (e) N.A.  
   - (f) N.A.  
   - (g) Wheat A-115 (local).  
   - (h) Gram A-115 (local).  
   - (i) Unirrigated.  
   - (j) Nil.  
   - (k) 0.15".  
   - (l) N.A.
2. TREATMENTS :
1. Wheat alone at 80 lb./ac.
2. Gram alone at 80 lb./ac.
3. Sowing wheat and gram together in the same row each with seed rate of 40 lb./ac.
4. Sowing wheat and gram together in the same row each with seed rate of 80 lb./ac.
5. Sowing wheat and gram separately in cross directions each with seed rate of 40 lb./ac.
6. Sowing wheat and gram separately in cross directions each with seed rate of 80 lb./ac.

3. DESIGN :
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a), (b) 30'×40'. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Good. (ii) N.A. (iii) Grain yield. (iv) (a) 1950 to 1953. (b), (c) N.A. (v) (a), (b) N.A. (vi) Nil. (vii) Farm harvest prices for the year 1952-53 for Hoshangabad Distt. have been taken in working out the money value. Wheat at Rs. 17.47/md. while gram at Rs. 16.95/md.

5. RESULTS :
(i) 79.38 Rs./ac.
(ii) 15.36 Rs./ac.
(iii) Treatment differences are not significant.
(iv) Av. value of grain in Rs./ac.

Crop : Wheat and Gram.
Site : Govt. Expnl. Farm, Powarkheda.
Object : To find out suitable mixture of Gram and Wheat.

1. BASAL CONDITIONS :
(i) (a) Nil. (b) Wheat, (c) 10 lb./ac. of N as A/S + 10 lb./ac. of P₂O₅ as Super. (ii) (a) Clay loam (marl) (b) —. (iii) 3.11.1953. (iv) (a) Timely bakhraring. (b) Sown with marl. (c) As per treatments. (d) Between lines 1'. (v) Nil. (vi) Wheat Hy. 11. Improved (medium); gram Adv. Improved. (vii) Unirrigated. (viii) Nil. (ix) 1.25'. (x) 8.4.1954.

2. TREATMENTS :
1. Wheat alone at 80 lb./ac.
2. Gram alone at 80 lb./ac.
3. Sowing wheat and gram together in the same row each with seed rate of 40 lb./ac.
4. Sowing wheat and gram together in the same row each with seed rate of 80 lb./ac.
5. Sowing wheat and gram separately in cross directions each with seed rate of 40 lb./ac.
6. Sowing wheat and gram separately in cross directions each with seed rate of 80 lb./ac.

3. DESIGN :
(i) R.B.D. (ii) (a) 6. (b) N.A. (iii) 6. (iv) (a), (b) 30'×40'. (v) Nil. (vi) Yes.

4. GENERAL :
(i) Good. (ii) Nil. (iii) Grain yield. (iv) (a) 1950 to 1953. (b) No. (c) N.A. (v) (a) N.A. (b) N.A. (vi) Nil. (vii) Farm harvest prices for the year 1953-1954 have been taken for Hoshangabad Distt. in working out the money value, wheat at Rs. 15.31/md. while gram at Rs. 11.06/md.

5. RESULTS :
(i) 67.51 Rs./ac.
(ii) 10.79 Rs./ac.
(iii) Treatment differences are significant.
(iv) Av. value of grain in Rs./ac.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>78.35</td>
</tr>
<tr>
<td>2.</td>
<td>61.77</td>
</tr>
<tr>
<td>3.</td>
<td>70.18</td>
</tr>
<tr>
<td>4.</td>
<td>71.15</td>
</tr>
<tr>
<td>5.</td>
<td>65.46</td>
</tr>
<tr>
<td>6.</td>
<td>58.14</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>4.40</td>
</tr>
</tbody>
</table>

Crop : Wheat and Gram.

Site : Govt. Seed and Demonstration Farm, Seoni.

Object : To compare the two methods of sowing 

1. BASAL CONDITIONS:

(i) (a) to (c) N.A. (ii) (a) and (b) N.A. (iii) 21. 25.1.1930. (iv) (a) 5 bakhraings (b) to (c) N.A. (v) and (vi) N.A. (vii) Unirrigated. (viii) and (ix) N.A. (x) 15.3.1931.

2. TREATMENTS:

1. Wheat alone at 80 lb./ac.
2. Gram alone at 80 lb./ac.
3. Sowing wheat and gram together in the same row each with seed rate of 40 lb./ac.
4. Sowing wheat and gram together in the same row each with seed rate of 30 lb./ac.
5. Sowing wheat and gram separately in cross directions each with seed rate of 40 lb./ac.
6. Sowing wheat and gram separately in cross directions each with seed rate of 30 lb./ac.

3. DESIGN:

(i) R D.D. (ii) 6. (b) N.A. (iii) 6. (iv) (a) and (b) 40'/30'. (v) Nil. (vi) Yes.

4. GENERAL:

(i) After good germination of all seeds, gram soon got upper hand over wheat which remained poor till end.
(ii) Nil. (iii) Wheat and gram yield. (iv) (a) No. (b) and (c) N.A. (v) (a) and (b) N.A. (vi) Has year was dry one. (vii) Farm harvest prices for Seoni district for the year 1951-52 have been taken as working out the money value; wheat at Rs. 17.50/ac. and gram at Rs. 9.00/ac.

5. RESULTS:

(f) 213.13 Rs./ac

(ii) 18.32 Rs./ac.

(iii) Treatment differences are highly significant.

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

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>119.73</td>
</tr>
<tr>
<td>2.</td>
<td>243.94</td>
</tr>
<tr>
<td>3.</td>
<td>230.81</td>
</tr>
<tr>
<td>4.</td>
<td>218.59</td>
</tr>
<tr>
<td>5.</td>
<td>214.41</td>
</tr>
<tr>
<td>6.</td>
<td>251.32</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>7.48</td>
</tr>
</tbody>
</table>

Crop : Groundnut and Cotton.

Site : Central Res. Farm, Ujjain.

Object : To find out if any of the inter-cropping treatments gives any extra monetary return to cultivator.

1. BASAL CONDITIONS:

(i) Nil. (b) Linseed. (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (iii) 4.7 1951. (iv) 3 bakhraings. (b) Seeds drilled. (c) to (e) N.A. (v) Compost worth of Rs 36/- (quantity N.A. was spread and bakhared. (vi) Variety : Cotton (a) - 16. Groundnut A.K. 12-24. (vii) N.A. (viii) First dora was given on 24. 25.7.1957. second dora on 2. 3.8.1951 and weeding on 29.8.1954. (ix) N.A. (x) Groundnut 16 to 19.10.1951. Cotton 1st picking 16 to 19.11.1951. 2nd picking on 9.1.1952.
3. TREATMENTS:
1. 2 rows of cotton + 6 rows of groundnut.
2. 2 rows of cotton + 14 rows of groundnut.
3. 2 rows of cotton + 20 rows of groundnut.
4. Only cotton.
5. Only groundnut.

3. DESIGN:
(i) R.B.D. (ii) (a) 5. (b) N.A. (iii) 4. (iv) (a) 76' x 75'. (b) 70' x 72'. (v) 3' x 1.5'. (vi) Yes.

4. GENERAL:
(i) Healthy and good. (ii) Nil. (iii) Cotton and groundnut yield. (iv) (a) and (b) No. (c) N.A. (v) (a) and (b) N.A. (vi) and (vii) Nil.

5. RESULTS:

<table>
<thead>
<tr>
<th>Groundnut</th>
<th>(i) to (iv) Av. yield of pod in lb./ac.</th>
<th>(i) to (iv) Av. yield</th>
<th>Cotton</th>
<th>(i) to (iv) Av. yield of cotton in lb./ac.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Av. yield</td>
<td>Treatment</td>
<td>Av. yield</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>1229</td>
<td>1.</td>
<td>106.95</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>1400</td>
<td>2.</td>
<td>55.39</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>1402</td>
<td>3.</td>
<td>32.41</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>1564</td>
<td>4.</td>
<td>659.02</td>
<td></td>
</tr>
</tbody>
</table>

Crop :- Wheat.

Site :- Govt. Exptl. Farm, Powarkheda.

Object :- To find best rotation for Wheat.

1. BASAL CONDITIONS:
(i) (a) and (b) As per treatments. (c) N.A. (ii) (a) Clay loam (mariyar). (b) Refer soil analysis, Powarkheda. (iii) 23.10.1948. (iv) (a) Bakharing and ploughing. (b) Drilling. (c) 100 lb./ac. (d) 12". (e) N.A. (v) N.A. (vi) A-115 (local). (vii) to (ix) N.A. (x) 2.3.1949.

2. TREATMENTS:
1. Wheat after tur.
2. Wheat after gram.
3. Wheat after birrah.
4. (a) Wheat after fallow.
   (b) Wheat after wheat after fallow.
5. Wheat continuously.

3. DESIGN:
(i) R.B.D. (ii) (a) 10. (b) N.A. (iii) 2. (iv) (a) and (b) 11' x 99'. (v) Nil. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Grain and bhussu yield. (iv) (a) 1942—1949. (b) Yes. (c) N.A. (v) (a) and (b) N.A. (vi) Nil. (vii) There are 10 plots in a block of which wheat is grown in 6 plots only. In one plot each tur, gram, birrah is grown and one is kept fallow.

5. RESULTS:
(i) 444.3 lb./ac.
(ii) 76.56 lb./ac.
(iii) Treatments are not significantly different.
(iv) Av. yield of grain in lb./ac.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>461.2</td>
</tr>
<tr>
<td>2.</td>
<td>582.6</td>
</tr>
<tr>
<td>3.</td>
<td>395.0</td>
</tr>
<tr>
<td>4.</td>
<td>372.4</td>
</tr>
<tr>
<td>(a)</td>
<td>423.6</td>
</tr>
<tr>
<td>5.</td>
<td>431.2</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>—54.12 lb./ac.</td>
</tr>
</tbody>
</table>
Crop :- Wheat.  
Site :- Govt. Exptl. Farm, Powarkheda.  

Object :- To find the best rotation for Wheat.

1. BASAL CONDITIONS :
   (i) (a) and (b) As per treatments. (c) N.A.  
   (ii) (a) Clay loam (marum). (b) Refer soil analysis, Powarkheda.  
   (iii) 24.10.1949. (iv) (a) Bakharing. (b) N.A. (c) 83 lb./ac. (d) 12.0. (e) N.A. (f) N.A. (g) A-115 (local).  
   (v) to (ix) N.A. (x) 3.4.1950.

2. TREATMENTS :
   1. Wheat after Tar.  
   2. Wheat after Gram.  
   3. Wheat after Birrah.  
   4. (a) Wheat after fallow.  
      (b) Wheat after Wheat.  

3. DESIGN :
   (i) R.B.D.  
   (ii) (a) 10. (b) N.A. (iii) 2. (iv) (a) and (b) 11'× 99'. (v) Nil. (vi) Yes.

4. GENERAL :
   (i) and (ii) N.A. (iii) Grain yield.  
   (iv) a: 1942—1949. (b) Yes. (c) N.A.  
   (v) N.A.  
   (vi) Nil.  
   (vii) The yield for treatment 3 was not recorded in both the replications. There are 10 plots in a block of which only in 6 plots wheat is grown, in one Tar, one for gram and one for Birrah and one fallow.

5. RESULTS :
   (i) 220.2 lb./ac.  
   (ii) 82.52 lb./ac.  
   (iii) Treatments are not significantly different.  
   (iv) Av. yield of grain in lb./ac.  

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Av. yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>225.0</td>
</tr>
<tr>
<td>2.</td>
<td>248.2</td>
</tr>
<tr>
<td>3.</td>
<td>N.A.</td>
</tr>
<tr>
<td>4.</td>
<td>180.0</td>
</tr>
<tr>
<td>(a)</td>
<td>172.4</td>
</tr>
<tr>
<td>(b)</td>
<td>177.4</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>58.56 lb./ac.</td>
</tr>
</tbody>
</table>

Crop :- Groundnut-Cotton-Wheat-Jowar.  
Site :- Institute of Plant Industry, Indore.  

Object:- To test the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS :
   (i) (a) Groundnut—Cotton—Wheat—Jowar. (b) and (c) N.A. (i) (a) Black cotton soil. (ii) N.A. (iii) N.A. (iv) (a) to (e) N.A. (v) N.A. (vi) Cotton: American. (vii) Untreated. (viii) to (x) N.A.

2. TREATMENTS :
   1. Control (no manure).  
   2. 18 lb/ac. of Cu as Copper Sulphate.  
   3. 15 lb/ac. of Zn as Zinc Sulphate.  
   4. 10 lb/ac. of B as Borax.  

Treatments applied in 1951.

3. DESIGN :
   (i) R.B.D.  
   (ii) (a) 4 (in each crop). (b) N.A. (iii) 2 (for each crop). (iv) (a) N.A. (v) 18'× 37' for cotton, 16'× 36' for groundnut, wheat and jowar. (vi) N.A. (vii) Yes.
4. GENERAL:
(i) and (ii) N.A. (iii) Pod, kapas and grain yields. (iv) (a) 1951—N.A. (b) Trace elements applied only in the first year 1951. Afterwards residual effect studied. (c) N.A. (v) (a) and (b) N.A. (vi) Field No. 20 (poor field). (vii) Experiment conducted under the Cotton Physiological Scheme.

5. RESULTS:
(i) to (iv) All figures in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>Groundnut</th>
<th>Cotton (kapas)</th>
<th>Wheat</th>
<th>Jowar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G.M.</td>
<td>S.E. /plot</td>
<td>Treatment Av. yield.</td>
<td>Av. yield</td>
</tr>
<tr>
<td></td>
<td>636</td>
<td>15.21</td>
<td>620</td>
<td>242</td>
</tr>
<tr>
<td></td>
<td>1.</td>
<td></td>
<td>676</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td></td>
<td>646</td>
<td>254</td>
</tr>
<tr>
<td></td>
<td>3.</td>
<td></td>
<td>619</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>S.E./mean</td>
<td>10.76</td>
<td>48.98</td>
<td>N.A.</td>
</tr>
<tr>
<td>Significance</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.A.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

Crop: Groundnut-Cotton-Wheat-Jowar.  Ref: M.P. 52(77)/51(91).
Site: Institute of Plant Industry, Indore.  Type: 'R'.

Object: To find out the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Groundnut-Cotton-Wheat-Jowar. (b) and (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
1. Control.
2. 18 lb./ac. of Cu as Copper Sulphate.
3. 15 lb./ac. of Zn as Zinc Sulphate.
4. 10 lb./ac. of B as Borax.
Treatments applied in 1951.

3. DESIGN:
(i) R.B.D. (ii) (a) (4 in each crop). (b) N.A. (iii) 2 (for each crop). (iv) (a) N.A. (b) 18' x 37' for cotton 16' x 33' for wheat, jowar and groundnut. (v) N.A. (vi) Yes.

4. GENERAL:
(i) and (ii) N.A. (iii) Pod, kapas and grain yield. (iv) (a) 1951—N.A. (b) Trace elements applied only in 1951. Afterwards residual effect studied. (v) (a) and (b) N.A. (vi) Field No. 20 (poor field). (vii) Experiment conducted under the Cotton Physiological Scheme (I.C.C.C).

5. RESULTS:
(i) to (iv) All figures in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>Groundnut</th>
<th>Cotton (kapas)</th>
<th>Wheat</th>
<th>Jowar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G.M.</td>
<td>S.E. /plot</td>
<td>Treatment Av. yield.</td>
<td>Av. yield</td>
</tr>
<tr>
<td></td>
<td>892</td>
<td>78.04</td>
<td>815</td>
<td>315</td>
</tr>
<tr>
<td></td>
<td>1.</td>
<td></td>
<td>970</td>
<td>362</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td></td>
<td>989</td>
<td>266</td>
</tr>
<tr>
<td></td>
<td>3.</td>
<td></td>
<td>793</td>
<td>256</td>
</tr>
<tr>
<td></td>
<td>S.E./mean</td>
<td>55.17</td>
<td>41.43</td>
<td>90.67</td>
</tr>
<tr>
<td>Significance</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.A.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>
Crop :- Groundnut-Cotton-Wheat-Jowar.  
Site :- Institute of Plant Industry, Indore.  
Ref :- M.P. 53(101).  
Type :- 'R'.

Object :- To find out the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Groundnut—Cotton—Wheat—Jowar. (b) As per rotation. (c) Nil. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) (a) to (c) N.A. (v) N.A. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   1. Control.
   2. 18 lb./ac. of Cu as Copper Sulphate.
   3. 15 lb./ac. of Zn as Zinc Sulphate.
   4. 10 lb./ac. of B as Borax.

Trace elements applied in 1951.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 2 (for each crop). (iv) (a) N.A. (b) 18'x37' for cotton and 16'x36' for wheat, groundnut and jowar. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Pod, kapas and grain yield. (iv) 1951 — N.A. (b) Trace elements applied only in 1951. Afterwards residual effect studied. (c) N.A. (v) (b) and (b) N.A. (vi) Field. No. 20. (poor field) (vii) Experiment conducted under the Cotton Physiological Scheme.

5. RESULTS:
   (i) to (iv) All figures in lb./ac.

<table>
<thead>
<tr>
<th></th>
<th>Groundnut</th>
<th>Cotton (kapas)</th>
<th>Wheat</th>
<th>Jowar</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.M.</td>
<td>660</td>
<td>112</td>
<td>378</td>
<td>565</td>
</tr>
<tr>
<td>S.E./plot</td>
<td>172.20</td>
<td>13.10</td>
<td>82.00</td>
<td>252.60</td>
</tr>
<tr>
<td>Treatment</td>
<td>Av. yield</td>
<td>Av. yield</td>
<td>Av. yield</td>
<td>Av. yield</td>
</tr>
<tr>
<td>1.</td>
<td>683</td>
<td>113</td>
<td>407</td>
<td>711</td>
</tr>
<tr>
<td>2.</td>
<td>681</td>
<td>104</td>
<td>375</td>
<td>445</td>
</tr>
<tr>
<td>3.</td>
<td>683</td>
<td>110</td>
<td>363</td>
<td>741</td>
</tr>
<tr>
<td>4.</td>
<td>591</td>
<td>112</td>
<td>568</td>
<td>363</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>121.75</td>
<td>13.68</td>
<td>57.97</td>
<td>178.59</td>
</tr>
<tr>
<td>Significance</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

Crop :- Groundnut-Cotton-Wheat-Jowar.  
Site :- Institute of Plant Industry, Indore.  
Ref :- M.P. 51(82).  
Type :- 'R'.

Object :- To find out the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Groundnut—Cotton—Wheat—Jowar. (b) and (c) N.A. (ii) (a) Black cotton soil. (b) N.A. (ii) N.A. (iv) (a) to (c) N.A. (v) Nil. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
   1. Control.
   2. 18 lb./ac. of Cu as Copper Sulphate.
   3. 15 lb./ac. of Zn as Zinc Sulphate.
   4. 10 lb./ac. of B as Borax.

Treatments applied in 1951 only.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 4 (for each crop). (iv) (a) N.A. (b) 18'x37' for cotton and 16'x36' for wheat, jowar and groundnut. (v) N.A. (vi) Yes.
4. GENERAL:
(i) and (ii) N.A. (iii) Pod, kapas and grain yield. (iv) (a) 1951—N.A. (b) Manurial treatments applied only in the first year 1951. Afterwards residual effect studied. (v) (a) and (b) N.A. (vi) Field No. 42 (rich field). (vii) Experiment conducted under the Cotton Physiological Scheme.

5. RESULTS:
(i) to (iv) All figures in lb./ac.

<table>
<thead>
<tr>
<th>Groundnut</th>
<th>G.M.</th>
<th>Cotton (kapas)</th>
<th>Wheat</th>
<th>Jowar</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E./plot</td>
<td>83.82</td>
<td>83.80</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Av. yield</td>
<td>1095</td>
<td>388</td>
<td>N.A.</td>
<td>725</td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>421</td>
<td>N.A.</td>
<td>829</td>
</tr>
<tr>
<td></td>
<td>1170</td>
<td>436</td>
<td>N.A.</td>
<td>788</td>
</tr>
<tr>
<td></td>
<td>1160</td>
<td>417</td>
<td>N.A.</td>
<td>800</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>41.91</td>
<td>41.90</td>
<td>N.A.</td>
<td>26.30</td>
</tr>
<tr>
<td>Significance</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.A.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

Crop :- Groundnut-Cotton-Wheat-Jowar
Site :- Institute of Plant Industry, Indore.

Object :- To find out the effect of rotation of crops and trace elements on the yield of Cotton.

1. BASAL CONDITIONS:
(i) (a) Groundnut-Cotton-Wheat-Jowar. (b) As per rotations. (c) As per treatments. (ii) (a) Black cotton soil. (b) N.A. (iii) N.A. (iv) to (e) N.A. (v) N.A. (vi) American Cotton. (vii) Unirrigated. (viii) to (x) N.A.

2. TREATMENTS:
1. Control.
2. 18 lb./ac. of Cu as Copper Sulphate.
3. 15 lb./ac. of Zn as Zinc Sulphate.
4. 10 lb./ac. of B as Borax.
Treatments applied in 1951.

3. DESIGN:
(i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 4 (for each crop). (iv) (a) N.A. (v) N.A. (vi) N.A. (vii) Unirrigated. (viii) to (x) N.A.

4. GENERAL:
(i) and (ii) N.A. (iii) Pod, kapas and grain yield. (iv) (a) 1951—N.A. (b) Manurals applied only in the first year—1951. Residual effect studied afterwards. (c) N.A. (v) (a) and (b) N.A. (vi) Field No. 42 (rich field). (vii) Experiment conducted under the Cotton Physiological Scheme.

5. RESULTS:
(i) to (iv) All figures in lb./ac.

<table>
<thead>
<tr>
<th>Groundnut</th>
<th>G.M.</th>
<th>Cotton (kapas)</th>
<th>Wheat</th>
<th>Jowar</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.E./plot</td>
<td>175.86</td>
<td>63.42</td>
<td>81.21</td>
<td>167.27</td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Av. yield</td>
<td>992</td>
<td>344</td>
<td>437</td>
<td>1365</td>
</tr>
<tr>
<td></td>
<td>1055</td>
<td>380</td>
<td>453</td>
<td>1553</td>
</tr>
<tr>
<td></td>
<td>1030</td>
<td>353</td>
<td>405</td>
<td>1446</td>
</tr>
<tr>
<td></td>
<td>1039</td>
<td>348</td>
<td>436</td>
<td>1530</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>87.93</td>
<td>31.71</td>
<td>40.60</td>
<td>81.65</td>
</tr>
<tr>
<td>Significance</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>
Site: Institute of Plant Industry, Indore. Type: 'R'.

Object: To find out the effect of rotation of crops and treatment elements on the yield of Cotton.

1. BASAL CONDITIONS:
   (i) (a) Groundnut-Cotton-Wheat-Jowar. (b) As per rotations: (c) N.A. (d) N.A. (e) N.A. (f) N.A. (g) N.A. (h) N.A. (i) N.A. (j) N.A.
   (ii) (a) Jowar-Groundnut-Cotton-Wheat. (b) As per rotation every year. (c) N.A. (d) N.A. (e) N.A. (f) N.A. (g) N.A.

2. TREATMENTS:
   1. Control
   2. 18 lb./ac. of Cu as Copper Sulphate.
   3. 15 lb./ac. of Zn as Zinc Sulphate.
   4. 10 lb./ac. of B as Borax.
   Treatments applied in 1951.

3. DESIGN:
   (i) R.B.D. (ii) (a) 4 (in each crop). (b) N.A. (iii) 4 (for each crop). (iv) (a) N.A. (b) 15 :times 15 for cotton, 16 :times 16 for groundnut, wheat and jowar. (v) N.A. (vi) Yes.

4. GENERAL:
   (i) and (ii) N.A. (iii) Pod, kapas and grain yields. (iv) (a) 1951. (b) Manurial treatments applied only in the first year 1951. Residual effect studied afterwards. (v) (a) and (b) N.A. (vii) Field No. 42 (rich field). (viii) Experiment conducted under the Cotton Physiological Scheme.

5. RESULTS:
   (i) to (iv) All figures in lb./ac.

<table>
<thead>
<tr>
<th>Groundnut</th>
<th>Cotton (kapas)</th>
<th>Wheat</th>
<th>Jowar</th>
</tr>
</thead>
<tbody>
<tr>
<td>G.M.</td>
<td>564</td>
<td>59.0</td>
<td>462</td>
</tr>
<tr>
<td>S.E./plot</td>
<td>82.60</td>
<td>10.88</td>
<td>69.31</td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>525</td>
<td>63.4</td>
<td>530</td>
</tr>
<tr>
<td>2</td>
<td>573</td>
<td>60.3</td>
<td>457</td>
</tr>
<tr>
<td>3</td>
<td>592</td>
<td>56.2</td>
<td>441</td>
</tr>
<tr>
<td>4</td>
<td>569</td>
<td>56.2</td>
<td>420</td>
</tr>
<tr>
<td>S.E./mean</td>
<td>41.30</td>
<td>5.44</td>
<td>34.66</td>
</tr>
<tr>
<td>Significance N.S.</td>
<td></td>
<td>N.S.</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

Crop: As per treatments. Ref: M.P. 53(98)/52(72)/51(84)/50(68)/49(63)/48(47).
Site: Institute of Plant Industry, Indore. Type: 'R'.

Object: To study the effect of organic and inorganic nitrogenous fertilizers on rotation crops and the influence of (a) rotation and (b) frequency of manuring on changes in soil productivity as measured principally by crop yields.

1. BASAL CONDITIONS:
   (i) (a) Three course rotations of Jowar-Cotton-Wheat. Few course rotation of Jowar-Groundnut-Cotton-wheat. (b) As per rotation every year. (c) As per scheme. (iii) (v) Black cotton soil of medium fertility. (b) Soil samples are taken after completion of each rotation but analysis not completed yet. (iii) From 25th June to 1st July depending upon advent of monsoon. (iv) 2. Necessary number of bakharings every year before sowing. (b) to (c) N.A. (v) No. (vi) Bhuj. Dhaur-43 for cotton, LPJ-3 for Jowar, C-591 for wheat and AK-12-24 for groundnut. (vii) Unirrigated. (viii) Summer bakharings. (ix) N.A. (x) N.A.
Contd. O O F Contd. O X O F
5. F F O F F X F O
6. F O F O X O F
7. O F F O X F F
8. F F F F O X O O
9. O O O S X O S O
10. S O O O X O S O
11. O S O S O X S O S
12. O O S S X O S S S
13. S S S S X S S S S
14. S O S O X O S S
15. O S S S O X S S S
16. S S S S O X S S S S
17. O O O O O X O O O O
18. G O O O G X O O O O
19. O G O O O X G O O O
20. O O G O O X O G O G
22. G O G G O X O G G G
23. O G G G O X G G G G
24. G G G G G X G G G G

Above are 24 main plot treatments where F = manuring with F.Y.M., S = Manuring with A/S, G = manuring with G.N.C. and O = No manure, Frequency of manuring used as per scheme given above. Each plot is divided in 3 sub-plots and following treatments given: M1 = 20 lb/ac. of N, M2 = 20 lb/ac. of P2O5 and M3 = 20 lb/ac. of N+20 lb/ac. of P2O5. Groundnut crop in the four course rotation is left unmanured, and the symbol is X.

3. DESIGN:
(i) (a) Split-plot (ii) (a) 24 main-plots/replication ; 3 sub-plots/main-plot. (b) 116'8" x 162' for each crop
(ii) (a) 9'4' x 27'. (b) 4'8' x 22'. (v) Two guard rows on either side of each crop plot. (vi) Randomisation at the starting time of the experiment and are continued as per scheme.

4. GENERAL:
(i) No lodging (ii) No incidence of pests. (iii) Height of random plants in Jowar and wheat crops for statistical study and average yield. (iv) (a) Long term duration. Started in kharif season of 1947 and is in progress still. (b) The crop plots are same every year as per crop rotation and manuring as per scheme.
(c) Nil. (v) (a) and (b) Nil. (vi) In expressing S.E.s, main-plots have been denoted by M while sub-plots by S.

5. RESULTS:

YEAR 1948

<table>
<thead>
<tr>
<th>CROP</th>
<th>COTTON</th>
<th>Rotation I</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>285 lb/ac.</td>
<td></td>
</tr>
<tr>
<td>(ii)</td>
<td>54.15 lb/ac.</td>
<td></td>
</tr>
<tr>
<td>(b)</td>
<td>41.42 lb/ac.</td>
<td></td>
</tr>
<tr>
<td>(iii)</td>
<td>Control vs. treated effect and interaction manures x (np vs n+1/2p) are significant. Effects due to kinds of effects and np vs n+1/2p are highly significant. Other effects are not significant.</td>
<td></td>
</tr>
<tr>
<td>(iv)</td>
<td>Av. yield of kapas in lb/ac.</td>
<td></td>
</tr>
</tbody>
</table>

Control = 265 lb/ac.

<table>
<thead>
<tr>
<th>FO</th>
<th>OF</th>
<th>FF</th>
<th>SO</th>
<th>OS</th>
<th>SS</th>
<th>GO</th>
<th>OG</th>
<th>GG</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>262</td>
<td>285</td>
<td>282</td>
<td>230</td>
<td>325</td>
<td>343</td>
<td>242</td>
<td>297</td>
<td>302</td>
</tr>
<tr>
<td>P</td>
<td>249</td>
<td>320</td>
<td>290</td>
<td>249</td>
<td>315</td>
<td>265</td>
<td>242</td>
<td>257</td>
<td>269</td>
</tr>
<tr>
<td>NP</td>
<td>278</td>
<td>288</td>
<td>292</td>
<td>290</td>
<td>396</td>
<td>366</td>
<td>285</td>
<td>282</td>
<td>371</td>
</tr>
<tr>
<td>Mean</td>
<td>263</td>
<td>298</td>
<td>288</td>
<td>256</td>
<td>345</td>
<td>325</td>
<td>256</td>
<td>314</td>
<td>291</td>
</tr>
</tbody>
</table>

S.E. of control mean = 9.03 lb/ac.
S.E. of difference of two
1. M marginal means = 22.11 lb/ac.
2. S marginal means = 9.76 lb/ac.
3. S means at the same level of M = 29.29 lb/ac.
4. M means at the same level of S = 32.57 lb/ac.
(i) Only control vs treated and n vs n+p effect are highly significant.
(ii) Av. yield of kapor in lb./ac.
   Control mean=350 lb./ac.

<table>
<thead>
<tr>
<th>CROP</th>
<th>COTTON</th>
<th>ROTATION II</th>
<th>CROP</th>
<th>GROUNDNUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) 345 lb./ac.</td>
<td></td>
<td>(i) 551 lb./ac.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii) (a) 82.00 lb./ac.</td>
<td></td>
<td>(ii) (a) 137.64 lb./ac.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) 58.77 lb./ac.</td>
<td></td>
<td>(b) 101.52 lb./ac.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iii) n+p vs n effect is significant.</td>
<td></td>
<td>(iii) None of the effects is significant.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(iv) Av. yield of dry pod in lb./ac.</td>
<td></td>
<td>(iv) Av. yield of dry pod in lb./ac.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Control mean=350 lb./ac.

<table>
<thead>
<tr>
<th>CROP</th>
<th>JOWAR (both rotations)</th>
<th>CROP</th>
<th>WHEAT (both rotations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) 481 lb./ac.</td>
<td></td>
<td>(i) 722 lb./ac.</td>
<td></td>
</tr>
<tr>
<td>(ii) (a) 153.8 lb./ac.</td>
<td></td>
<td>(ii) (a) 183.3 lb./ac.</td>
<td></td>
</tr>
<tr>
<td>(b) 114.2 lb./ac.</td>
<td></td>
<td>(b) 116.3 lb./ac.</td>
<td></td>
</tr>
<tr>
<td>(iii) Control vs treated and n vs n+p effect are highly significant. Interaction manures x kind of effects is significant. Other effects are not significant.</td>
<td></td>
<td>(iii) Control vs treated effect is significant. n+p vs n+p effect is highly significant. Other effects are not significant.</td>
<td></td>
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<tr>
<td>(iv) Av. yield of grain in lb./ac.</td>
<td></td>
<td>(iv) Av. yield of grain in lb./ac.</td>
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Control mean=423 lb./ac.

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<tr>
<td>GG</td>
<td>485</td>
<td>455</td>
<td>482</td>
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</table>

Mean 490 469 543 501

S. E. of the Control mean =18.13 lb./ac.

S. E. of difference of two
1. M marginal means =44.00 lb./ac.
2. S marginal means =19.03 lb./ac.
3. S means at the same level of M=57.10 lb./ac.
4. M means at the same level of S=64.38 lb./ac.

S. E. of difference of two
1. M marginal means =52.91 lb./ac.
2. S marginal means =19.48 lb./ac.
3. S means at the same level of M=58.45 lb./ac.
4. M means at the same level of S=71.26 lb./ac.
COTTON Rotation I Year 1949.

(i) 276 lb./ac.
(ii) (a) 59.2 lb./ac.
(b) 47.0 lb./ac.

(iii) Control vs. treated, kinds of effects, n vs. p, np vs. n+p effects and interactions effects x sub-treatments and manures x effects x np vs n+p are highly significant. Interactions manures and manure effects x np vs n+p are significant. Other effects are not significant.

(iv) Av. yield of kapas in lb./ac.
Control=215 lb./ac.

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<tr>
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S.E. of the control mean =13.95 lb./ac.
S.E. of difference of two =22.13 lb./ac.

WHEAT Rotation II Year 1949.

(i) 556 lb./ac.
(ii) (a) 93.9 lb./ac.
(b) 81.2 lb./ac.

(iii) Control vs. treated and manures effects are significant, kinds of effects and np vs n+p effects are highly significant. Others are not significant.

(iv) Av. yield of grain in lb./ac.
Control=505 lb./ac.

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<tr>
<td>Mean</td>
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</tbody>
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S.E. of the control mean =34.18 lb./ac.
S.E. of difference of two =54.21 lb./ac.

COTTON Rotation II Year 1949.

(i) 308 lb./ac.
(ii) (a) 96.7 lb./ac.
(b) 53.8 lb./ac.

WHEAT Rotation II Year 1949.

(i) 489 lb./ac.
(ii) (a) 110.5 lb./ac.
(b) 71.7 lb./ac.
(iii) Control vs. treated, kinds of effects, np vs. \( n+p \) effects and interaction manure \( \times \) sub-treatments are highly significant. Interaction manures \( \times \) effects \( \times \) sub-treatments are significant.

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

<table>
<thead>
<tr>
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<tr>
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<td>293</td>
<td>315</td>
<td>364</td>
<td>324</td>
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S.E. of the control mean = 16.12 lb./ac.

S.E. of difference of two
1. M marginal means = 39.46 lb./ac.
2. S marginal means = 12.68 lb./ac.
3. S means at the same level of M = 38.01 lb./ac.
4. M means at the same level of S = 50.23 lb./ac.

Groundnut Year 1949

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S.E. of the control mean = 18.42 lb./ac.
## Cotton Rotation I Year 1950

(i) 241 lb./ac.

(ii) (a) 62.9 lb./ac.
(b) 35.5 lb./ac.

(iii) Control vs treated, kinds of effects, \( n \times p \times \frac{n+p}{2} \) effects and interactions effects \( \times \) sub-treatments and manures \( \times \) effects \( \times \) np \( \times \frac{n+p}{2} \) are highly significant. Manures effect is highly significant. Other effects are not significant.

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

Control = 174 lb./ac.

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<tr>
<td>SOSO</td>
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<td>192</td>
<td>159</td>
</tr>
</tbody>
</table>

## Cotton Rotation II Year 1950

(i) 376 lb./ac.

(ii) (a) 72.9 lb./ac.
(b) 52.9 lb./ac.

(iii) Control vs treated, \( n \times p \times \frac{n+p}{2} \) effects and interaction effects \( \times \) sub-treatments are highly significant. Kinds of effects and \( n \times p \) effects are significant. Other effects are not significant.

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

Control = 317 lb./ac.

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## WHEAT Rotation I Year 1950

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S.E. of the control mean

-14.83 lb./ac.

S.E. of difference of two

-36.32 lb./ac.

1. M marginal means

-7.75 lb./ac.

2. S marginal means

-35.50 lb./ac.

3. S means at the same level of M

-46.46 lb./ac.

4. M means at the same level of S

### WHEAT Rotation II Year 1959

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<td>159</td>
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<td>12</td>
<td>587</td>
<td>105.0 lb./ac.</td>
<td>(ii) 315 lb./ac.</td>
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<td>(v) Av. yield of grain in lb./ac.</td>
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<tr>
<td>Control=594 lb./ac.</td>
<td>Control=547 lb./ac.</td>
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### JOWAR Rotation I Year 1950

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<td>567</td>
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</tbody>
</table>

S.E. of control mean = 37.50 lb./ac. 
S.E. of control mean = 24.75 lb./ac.

1. M marginal means = 91.86 lb./ac. 
2. S marginal means = 21.21 lb./ac.
3. S means at the same level of M = 97.20 lb./ac. 
4. M means at the same level of S = 121.40 lb./ac.

---

### JOWAR Rotation II year 1950

<table>
<thead>
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S.E. of the control mean = 37.81 lb./ac.
S.E. of difference of two means:
1. M marginal means = 92.61 lb./ac.
2. S marginal means = 35.87 lb./ac.
3. S means at the same level of M = 164.40 lb./ac.
4. M means at the same level of S = 163.10 lb./ac.

GROUNDNUT Year 1950

(i) 1024 lb./ac.
(ii) (a) 351.5 lb./ac.
(b) 160.8 lb./ac.
(iii) \( n \times p \) effect alone is highly significant.
(iv) Av. yield of dry pod in lb./ac.

Control = 995 lb./ac.

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Mean = 941 lb./ac. mean = 985 lb./ac.
S.E. of the control mean = 42.85 lb./ac.
S.E. of difference of two means:
1. M marginal means = 202.50 lb./ac.
2. S marginal means = 35.69 lb./ac.
3. S means at the same level of M = 160.80 lb./ac.
4. M means at the same level of S = 241.70 lb./ac.

GROUNDNUT Year 1951

(i) 1048 lb./ac.
(ii) (a) 184.9 lb./ac.
(b) 131.2 lb./ac.
(iii) \( n \times p \) and n-p effects are highly significant. Control vs treated and manures effects are significant. Other effects are not significant.
(iv) Av. yield of dry pod in lb./ac.

Control = 956 lb./ac.

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Mean = 941 lb./ac. mean = 985 lb./ac.
S.E. of the control mean = 42.87 lb./ac.
COTTON Rotation I Year 1951

(i) 302 lb./ac.
(ii) (a) 50.9 lb./ac.
(b) 35.3 lb./ac.

(iii) Control vs treated, kinds of effects, n vs p, np vs \( \frac{n+p}{2} \) effects and interaction of effects x sub-treatments are all highly significant. Interaction manures x effects and manures x effects x np vs \( \frac{n+p}{2} \) are all significant. Others are not significant.

(iv) Av. yield of cotton in lb./ac.
Control = 257 lb./ac.

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COTTON Rotation II Year 1951

(i) 488 lb./ac.
(ii) (a) 124.0 lb./ac.
(b) 70.0 lb./ac.

(iii) Control vs treated n vs p, np vs \( \frac{n+p}{2} \) effects and interaction of effects x sub-treatments are all highly significant, kinds of effects is significant and others are not significant.

(iv) Av. yield of cotton in lb./ac.
Control = 387 lb./ac.

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WHEAT Rotation I Year 1951

(i) 323 lb./ac.
(ii) (a) 163.8 lb./ac.
(b) 65.6 lb./ac.

(iii) None of the effects is significant.

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<td>(i) 262 lb./ac.</td>
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<td>(ii) (a) 88.7 lb./ac.</td>
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(b) 51.1 lb./ac.             |

| Interaction of effects x sub-treatments alone is significant. |   |

S.E. of the control mean = 12.03 lb./ac.
S.E. of difference of two
1. M marginal means = 29.39 lb./ac.
2. S marginal means = 7.70 lb./ac.
3. S means at the same level of M = 35.30 lb./ac.
4. M means at the same level of S = 41.16 lb./ac.

Mean of the control = 323 lb./ac.
Mean of difference of two
1. M marginal means = 128.39 lb./ac.
2. S marginal means = 34.70 lb./ac.
3. S means at the same level of M = 78.30 lb./ac.
4. M means at the same level of S = 91.61 lb./ac.
(iv) Av. yield of grain in lb/ac.

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Mean 321 348 325 331

S.E. of the control mean = 35.61 lb/ac.
S.E. of difference of two
1 M marginal means = 94.5 lb/ac.
2 S marginal means = 14.31 lb/ac.
3 S means at the same level of M = 65.60 lb/ac.
4 M means at the same level of S = 48.46 lb/ac.

JOWAR Rotation I Year 1951

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Other effects are not significant.
(iv) Av. yield of grain in lb/ac.

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Mean 850 727 717 848

JOWAR Rotation II Year 1951.

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Mean 850 727 717 848

S.E. of the control mean = 6.16.1 lb/ac.
S.E. of difference of two
1 M marginal means = 11.5 lb/ac.
2 S marginal means = 11.3 lb/ac.
3 S means at the same level of M = 10.8 lb/ac.
4 M means at the same level of S = 6.6 lb/ac.

Av. yield of grain in lb/ac.

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| Mean | 773 | 704 | 907 | 795 | Mean | 814 | 729 | 893 | 812 |

S.E. of the control mean = 56.7 lb./ac.
S.E. of difference of two means = 38.4 lb./ac.

1. M marginal means = 138.8 lb./ac.
2. S marginal means = 35.9 lb./ac.
3. S means at the same level of M = 164.7 lb./ac.
4. M means at the same level of S = 193.3 lb./ac.

### COTTON Rotation I Year 1952

(i) 344 lb./ac.
(ii) (a) 63.1 lb./ac.
(b) 60.1 lb./ac.
(iii) Kinds of effects, n vs. p and np vs. \( \frac{n + p}{2} \) effects are highly significant. Control vs. treated effect and interaction of manures \( \times \) effects are significant,
(iv) Av. yield of seed cotton in lb./ac.

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### COTTON Rotation II Year 1952

(i) 467 lb./ac.
(ii) (a) 91.8 lb./ac.
(b) 68.8 lb./ac.
(iii) Control vs treated, np vs \( \frac{n + p}{2} \) effects are highly significant, kinds of effects is significant while other effects are not significant.
(iv) Av. yield of seed cotton in lb./ac.

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| SSTOS : OS | 454 | 343 | 517 | 479 | XSOXSO | 485 | 474 | 467 |
| OSSOS : SS | 345 | 255 | 365 | 322 | XSOXSO | 371 | 365 | 371 |
| SSOSSSS | 484 | 331 | 438 | 418 | XSOXSO | 479 | 477 | 477 |
| COGGOOG | 378 | 355 | 315 | 349 | XGOOGO | 429 | 527 | 429 |
| OGOOGGO | 318 | 288 | 295 | 360 | XGOOGO | 374 | 374 | 374 |
| GOOGGG | 367 | 272 | 335 | 374 | XGOOGO | 334 | 238 | 238 |
| GGGGGG | 344 | 269 | 527 | 394 | XGOOGO | 394 | 469 | 469 |
| 404 | 285 | 408 | 396 | XGOOGO | 396 | 396 | 396 |

Mean: 365 310 371
Mean: 349 Mean: 468 477 477

S.E. of control mean = 49.87 lb/acre.
S.E. of the difference of two
1. M marginal means = 34.33 lb/acre.
3. M means at the same level of M = 60.1 lb/acre.
4. M means at the same level of S = 91.7 lb/acre.

N p NP
WHEAT Rotation I Year 1952
(i) 484 lb/acre.
(ii) (a) 64.2 lb/acre.
(b) 75.2 lb/acre.
(iii) None of the effects is significant.

WHEAT Rotation II Year 1952
(i) 484 lb/acre.
(ii) Control vs. treated, e.g., B: F effects are
highly significant. Interaction of marginal
effects is significant while other effects are
not significant.
(iii) Av. yield of grain lb/acre.
Control = 458 lb/acre.

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Mean: 486
Mean: 458
Mean: 386
Mean: 403
### JOWAR Rotation I Year 1952

(i) 1048 lb./ac.
(ii) (a) 173.5 lb./ac.
(b) 117.0 lb./ac.
(iii) Control vs treated, np vs \( \frac{n+p}{2} \) effects and interactions effects x sub-treatments and manures x effects x np vs \( \frac{n+p}{2} \) are highly significant, kinds of effects is significant, while other effects are not significant.
(iv) Av. yield of grain in lb./ac.

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Mean: 473, 485, 506

S.E. of control mean = 15.13 lb./ac.
S.E. of difference of two
1. M marginal means = 37.07 lb./ac.
2. S marginal means = 16.63 lb./ac.
3. S means at the same level of M = 76.20 lb./ac.
4. M means at the same level of S = 91.42 lb./ac.

### JOWAR Rotation II Year 1952

(i) 1036 lb./ac.
(ii) (a) 379.2 lb./ac.
(b) 161.4 lb./ac.
(iii) Manures effect is significant, np vs \( \frac{n+p}{2} \) effect is highly significant. Other effects are not significant.
(iv) Av. yield of grain in lb./ac.

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Mean: 985

S.E. of control mean = 24.37 lb./ac.
S.E. of difference of two
1. M marginal means = 59.70 lb./ac.
2. S marginal means = 18.50 lb./ac.
3. S means at the same level of M = 84.80 lb./ac.
4. M means at the same level of S = 91.42 lb./ac.
### GROUNDNUT Year 1952

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Mean | 1033  | 993  | 1198  | 1075 | Mean  | 993  | 991 | 1149  |

S.E. of control mean = 40.89 lb./ac.

S.E. of difference of two means = 218.9 lb./ac.

1. M marginal means = 100.20 lb./ac.
2. S marginal means = 25.53 lb./ac.
3. C marginal means = 177.00 lb./ac.
4. M means at the same level of S = 138.42 lb./ac.

Control = 642 lb./ac.

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### GROUNDNUT Year 1953

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Mean | 1033  | 993  | 1198  | 1075 | Mean  | 993  | 991 | 1149  |

S.E. of control mean = 89.4 lb./ac.

S.E. of difference of two means = 33.2 lb./ac.

1. M marginal means = 161.4 lb./ac.
2. S marginal means = 255.3 lb./ac.

Control = 820 lb./ac.

---

(i) 754 lb./ac.
(ii) (a) 182.8 lb./ac.
(b) 115.0 lb./ac.
(iii) Control vs. treated: effects are highly significant. Interaction manures × n means vs. n x p is significant. Other effects are not significant.
(iv) Av. yield of pod in lb./ac.
### COTTON Rotation I Year 1953

(i) 248 lb./ac.
(ii) (a) 55.3 lb./ac.
(b) 27.6 lb./ac.
(iii) Control vs. treated, kinds of effects, np vs.
\[
\frac{n+p}{2} \text{ effects and interaction effects} \times \text{sub-treatments and manures} \times \text{effects} \times \text{np vs.} \frac{n+p}{2} \text{ are highly significant. Other effects are not significant.}
\]
(iv) Av. yield of kapas in lb./ac.

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Mean 272 208 287 256

S.E. of control mean = -13.03 lb./ac.
S.E. of difference of two
1. M marginal means = -31.93 lb./ac.
2. S marginal means = 6.02 lb./ac.
3. S means at the same level of M = -27.60 lb./ac.
4. M means at the same level of S = -39.08 lb./ac.

### COTTON Rotation II Year 1953

(i) 339 lb./ac.
(ii) (a) 42.3 lb./ac.
(b) 33.1 lb./ac.
(iii) Control vs. others, kinds of effects, np vs.
\[
\frac{n+p}{2} \text{ effects and interaction effects} \times \text{sub-treatments and manures} \times \text{effects} \times \text{np vs.} \frac{n+p}{2} \text{ are highly significant. Interaction manures} \times \text{effects is significant. Other effects are not significant.}
\]
(iv) Av. yield of kapas in lb./ac.

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Mean 351 312 377 334

S.E. of control mean = 9.97 lb./ac.
S.E. of difference of two
1. M marginal means = -24.42 lb./ac.
2. S marginal means = 7.22 lb./ac.
3. S means at the same level of M = -33.10 lb./ac.
4. M means at the same level of S = -36.42 lb./ac.
### WHEAT Rotation I Year 1953

(i) 333 lb./ac.
(ii) (a) 134.2 lb./ac.
(b) 86.5 lb./ac.

(iii) np vs $\frac{n+p}{2}$ effect is significant, interaction manures $\times$ np vs. $\frac{n+p}{2}$ is highly significant while other effects are not significant.

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

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Mean 350 336 383 360

S.E. of control mean = 31.63 lb./ac.
S.E. of difference of two
1. M marginal means = 77.48 lb./ac.
2. S marginal means = 18.88 lb./ac.
3. S means at the same level of M = 86.50 lb./ac.
4. M means at the same level of S = 104.84 lb./ac.

### WHEAT Rotation II Year 1953

(i) 339 lb./ac.
(ii) (a) 158.8 lb./ac.
(b) 96.9 lb./ac.

(iii) n vs. p effect alone is highly significant

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

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Mean 333 373 366 341

S.E. of control mean = 37.44 lb./ac.
S.E. of difference of two
1. M marginal means = 91.63 lb./ac.
2. S marginal means = 21.15 lb./ac.
3. S means at the same level of M = 97.90 lb./ac.
4. M means at the same level of S = 121.16 lb./ac.

### JOWAR Rotation I Year 1953

(i) 634 lb./ac.

(ii) (a) 133.1 lb./ac.
(b) 123.2 lb./ac.

(iii) Control vs. treated, np vs. $\frac{n+p}{2}$ effects are highly significant. Manures and interaction manures $\times$ effects are significant. Other effects are not significant.

### JOWAR Rotation II Year 1953

(i) 636 lb./ac.

(ii) (a) 215.5 lb./ac.
(b) 160.7 lb./ac.

(iii) Control vs. treated effect alone is highly significant.
(iv) Average yield of grain in lb./ac.

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Mean 629 620 709 633 Mean 651 570 745 655

S.E. of control mean = 50.79 lb./ac.
S.E. of difference of two

1. M marginal means = 78.00 lb./ac.
2. S marginal means = 26.88 lb./ac.
3. S means at the same level of M = 123.20 lb./ac.
4. M means at the same level of S = 127.30 lb./ac.